Technology for Good

ISSIP 2023 Discovery Summit

This file: https://docs.google.com/document/d/1S9C3qffOGG_jsKpdwrnYRUBrC-bKnTlNDrIchFW6LjY/edit
This folder: https://drive.google.com/drive/folders/1FMTFFOptrAea4CWtcOwCZ63lTsWpq0oM

Author: Deb Stokes, “Tech For Good” Discovery Summit Leader; Jim Spohrer, ISSIP Board of Directors
Co-authors: Ammar Rayes, Utpal Mangla
Review by: Carlotta Arthur, and Panelists Vanita Wells, David Lee, Nicole Reineke, Renee Yao
Contributors: Debra Satterfield, Michele Carroll

Outline

- Section 1: Introduction: Event Description
- Section 2: Speaker Bios
- Section 3; Key Insights
- Section 4: Survey Results
- Section 5: Position Statements
- Section 6: Concluding Remarks: Additional Questions
- References
- Appendix I: Summary of Survey Data Analytics
- Appendix II: Event Transcript Plus Chat Commentary

Section 1: Introduction: Event Description

On September 27th, 2023, ISSIP delivered a “Tech for Good” Discovery Summit event. This whitepaper describes the event, key findings of the ISSIP survey results presented, the position statements of panelists and contributing ISSIP community and additional questions. Following this description, you will find a list of relevant resources, and reference materials for the event discussion.

247 individuals registered for the event, which included the following description:

ISSIP’s 2023 Discovery Summit: Tech for Good explored the technology landscape in the AI era, innovative uses of tech for societal good, and in vibrant dialogue, addressed how we can

guide development, understanding and implementation of technology for optimal benefit to people, business, and society, with the following event flow:

Event Flow
Welcome – ISSIP President Utpal Mangla of IBM
2023 ISSIP Tech for Good Survey Findings – Michele Carroll, Executive Director – ISSIP
Keynote Address – *"Multidisciplinary by Design: Leveraging diverse teams to advance innovation and equity"* — Carlotta Arthur, Executive Director, Division of Behavioral and Social Sciences and Education (DBASSE), National Academies of Sciences, Engineering and Medicine (NASEM)

Tech for Good Panel:
Moderator – Event Chair, Deborah Stokes of Dell Technologies and ISSIP Vice President
Vanita Wells, VP, Customer & Supply Chain Operations (Reality Labs), Meta
David Lee – Director Tech for Good Lab at UC Santa Cruz
Renee Yao – Global Lead, Healthcare AI Startups, NVIDIA
Nicole Reineke, Founder & CTO, SHIFT5.ai

Participating panelists represented a cross section of industry, academia, NGO and government entities, including the National Academies of Sciences, Engineering and Medicine, Meta, the Baskin School of Engineering at the University of Santa Cruz, Silicon Valley, NVIDIA, SHIFT5.AI, Dell Technologies, IBM and the ISSIP (International Society of Service Innovation Professionals). *(See featured speaker bios below).*



*"Technology has no overall purpose on its own; its effects are driven by human choices and actions. History is filled with examples of its potential both to do good and to cause harm."**

"Tech for good" is a term used to describe the use of technology to solve environmental, social and governance problems. It is a broad term that encompasses a wide range of activities, from using technology to provide clean water in developing countries to using technology to improve citizen understanding and engagement on complex issues. Tech

*for good encompasses how the diversity of teams can drive innovation– and even explore use cases for generative AI to drive increased productivity and happiness.**"*

Tech for good is often driven by social entrepreneurs, who are people who use business principles to solve grand societal challenges, such as ending poverty, hunger, injustice, and other United Nations Sustainable Development Goals. Service innovation professionals from industry, academia, and government partner with social entrepreneurs, who are often motivated by a desire to make a positive difference in the world, and also see technology as a powerful tool to improve outcomes for under-served populations.

ISSIP defines Service as the application of resources (e.g., knowledge, capabilities, technology, or goods) for the benefit of another. Service innovations arise when responsible actors use emerging technologies, business models, and/or institutional arrangements to improve win-win interaction and change, increasing benefits and reducing harms for all stakeholders. For tech to be good, harms must be anticipated and minimized, so that when benefits scale, 'global' impact is positive.

All individuals who registered for the event were sent a link to the event recording, slides, and this whitepaper.

2. Speaker and Panelists Bios

Keynote Speaker and Topic Abstract — Carlotta Arthur, 'Multidisciplinary by Design: Leveraging diverse teams to advance innovation and equity.'

Carlotta Arthur, Executive Director of United States NASEM's Division of Behavioral and Social Sciences and Education (DBASSE), focuses the knowledge, analytical tools, and methods of the behavioral and social sciences on some of the most pressing issues facing the nation. NASEM interdisciplinary research has shown that advances in science and engineering increasingly require collaboration to cut across traditional disciplines to address complex problems. However, collaborative approaches to innovation, that importantly include deep social and behavioral science expertise from the beginning, seem relatively rare. Inclusion of social and behavioral science professionals on diverse, multidisciplinary teams at the outset can have significant positive implications at all steps of the innovation process, as well as for equity. Arthur's keynote will explore this challenge and opportunity in an address titled: "Multidisciplinary by Design: Leveraging diverse teams to advance innovation and equity."

ISSIP 'Technology for Good' Survey Findings - Michele Carroll, Executive Director of ISSIP

Michele Carroll, created and led the annual Innovation Summit for the Council of Supply Chain Management (CSCMP) San Francisco/Silicon Valley until the 2020 pandemic. She became Executive Director of the International Society of Service Innovation Professionals (ISSIP) in 2022, to lead growth and development of the global community committed to advancing service innovation to benefit people, business and society. Founder and president of Carrollco Marketing Services, MIchele's teams are best known for marketing support for leaders and innovators in the supply chain management and logistics sector and for guiding startups from abroad to launch and gain traction in the US market. Carrollco has guided more than 800 Irish and Northern Irish startups to secure funding, and accelerate growth in the USA since its founding in 1994. Michele serves in the leadership and advisory capacities for multiple boards and non-profit organizations from the International Society

of Service Innovation Professionals (ISSIP) and the Council of Supply Chain Management Professionals (CSCMP) to Heart in Balance which provides mental health services for the underserved in Oakland, CA and MDUUC, a progressive faith community in San Francisco's East Bay.

Panelists:

Vanita Wells - VP, Customer & Supply Chain Operations (Reality Labs) at Meta, Vanita Wells is a resourceful operations executive with a proven track record of success across a wide range of operations functions and business models. Innovative, inspiring, and energetic leader with excellent project management, problem solving, information systems, and communication skills. She is recognized as a quick study with a reputation for producing high-impact results and consistently leading teams that deliver critical business objectives. Specialties: leadership, operations management, supply chain design & management, start ups, problem solving, project management, forward & reverse logistics, service operations, customer support, general business operations.

Renee Yao - With over 10 years of experience in the technology and healthcare sectors, Renee is a passionate leader who thrives on building and scaling ecosystems that accelerate the adoption and deployment of AI solutions. As the Ecosystem Business Development Lead for Healthcare Life Sciences at NVIDIA, she oversees a portfolio of 3k startups and manages strategic partnerships with global stakeholders across the value chain. Her core competencies include business development, developer relations, product management, go-to-market strategies, and data-driven decision making. I have a proven track record of delivering exceptional results, such as achieving a 3.75x software adoption, 157% revenue growth, and 6.5x more developers trained in healthcare AI. I also hold multiple certifications in social media, big data, and AI from prestigious institutions such as NVIDIA, Stanford, MIT, and Berkeley.

David Lee - Teaches courses on social computing, design and entrepreneurship, and leads the Tech4Good lab (tech4good.soe.ucsc.edu), University of California, Santa Cruz where we do research on scaling experiential education and supporting community collaboration. His overall focus is on designing human-AI ecosystems for education, work, and communities. David is Assistant Professor in the Department of Computational Media at the and was a Ph.D candidate in electrical engineering with Stanford University.

Nicole Reineke - Nicole Reineke is Distinguished Product Manager - AI Strategy for N-able. Prior to this role, she was CTO and co-Founder of Shift5.ai, Senior Vice President of Innovation at Iron Mountain, and a Senior Distinguished Engineer in the office of the CTO at Dell Technologies. Over the last 20 years, she has founded and led several high-tech companies. She is a recognized inventor (with 36 granted patents), innovation leader (author Compassion-Driven Innovation – https://amzn.to/3FUQY0b), and passionate about discovering, designing, and building solutions that shift industries.

Deborah Stokes - Leader, External Research as part of the Office of the CTO, for Dell Technologies, Deb is responsible for management and collaboration with universities and research institutions to drive innovation, and advanced technology exploration. She chairs the Technology Exploration (TEx) internal conference to share innovation and thought leadership with the Dell technical community, and is the 2024 president of the International Society of Service Innovation Professionals (ISSIP). Deb has served in vICT leadership positions for 25+years in both academia and industry. Her BNR/Nortel career included a number of positions with increasing responsibilities across R&D, external research, university interaction, business development, operations, and marketing/communications, providing opportunities to utilize her skills in program management, technology management, innovation, cross organization collaboration, knowledge management and leadership. Her contributions included the Wireless Mesh Network product (managing the contributions of the MIT Media Lab), a patent application for measuring the return on external investments, and effectively managing an external research portfolio valued at $250M+. Deb is a recognized speaker on best practices in external research and innovation, with a number of publications,

has a BS in Business Administration, and completed her Executive MBA at the University of Texas at Dallas, with a focus on "Managing for Change".

All featured speakers and panelists for this event earned an iSSIP Knowledge Sharing Eminence digital certification, provided in a link afterward for posting to LInkedIn profiles.

3. Key Insights, Executive Summary

Key Insights from the ISSIP Discovery Summit:

1. There is increasing consensus that scientific work cannot be excellent without consideration of diversity, equity and inclusion (DEI). That is the perspective taken by The national academies for sciences and technology to be more relevant, it needs to include a broader range of people of social and social science, related issues that need to be addressed. Diversity, equity, and inclusion should be considered as a matter of course in the work. Innovation also benefits significantly from both multidisciplinary approaches that consider ethics and social factors. For example. factors related to fair distribution of benefits and risks of new technologies. Too often it seems that new technologies when they're launched the negative impacts disproportionately land on those who are already in disadvantaged positions, who face barriers and challenges in our society.So the inclusion and understanding of diverse perspectives, excellence, inclusion - all of those factors should be included at the outset.
2. Renee Yao of NVIDIA highlighted NVIDIA efforts to leverage AI to drive global change. Said Ms. Yao, “ We're revolutionizing healthcare with early, personalized diagnoses in imaging, instruments, drug discovery, genomics, and analytics; and using AI to combat climate change through optimized energy efficiency and predictive weather modeling. Together, we're innovating for a healthier, sustainable future.’
3. Vanita Wells’s talk focused on the positive impacts of virtual reality (VR) including creating a sense of presence and a sense of agency, and generating empathetic, emotional responses in VR users. She shared powerful, real examples of the deployment of VR for good. In supporting health, for example, VR applications include fitness, pain management, and mental well-being. VR has proved remarkably effective as a training tool in areas as diverse as surgical training, infrastructure maintenance, and soft skills business skills. And VR experiences such as “visiting” refugee camps and 1960s Jim Crow South boost users’ compassion, allowing them to experience the world from another perspective which leads to better understanding and appreciation of others’ lived experiences.
4. David Lee’s talk focused on educating innovators on technology for societal good through the development of student programs that scale real-world experiential learning. He shared about work happening in the Tech4Good Lab at UC Santa Cruz on developing micro-role based curricula in which learning is organized after the workplace, with real-world projects decomposed into smaller roles that tie learning to contributions

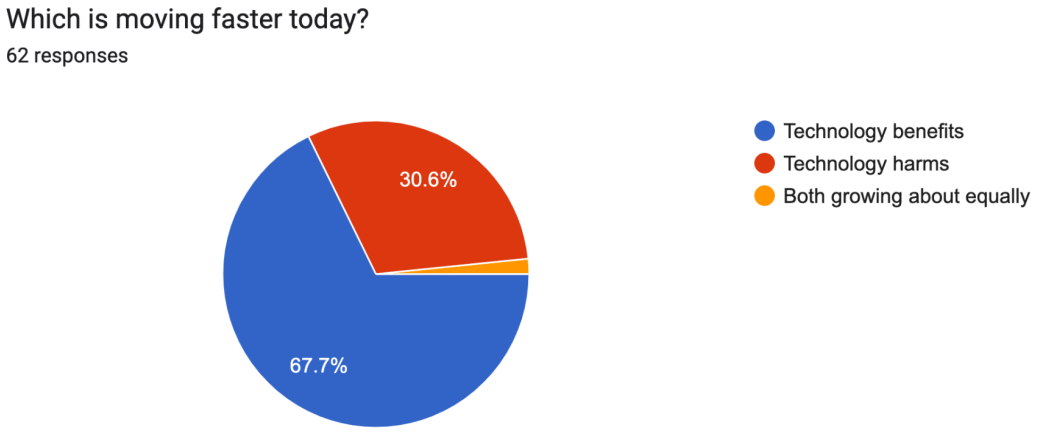
to non-profit projects. He talked about using AI to identify high-quality work from a classroom of peers to scale mentorship and coaching. In a whitewater world, there is a need for new structures that support continuous upskilling in which learning is deeply tied to real-world work. There is also an opportunity for these learning experiences to be tied to supporting community projects. These themes were elaborated on further in this later talk on Designing human-AI ecosystems for education, work, and communities.

5. Nicole Reineke's talk at the ISSIP Tech for Good event highlights the importance of systematic compassion in technological innovation. She emphasizes that traditional approaches like empathy and journey mapping, while valuable, fall short of fully addressing the complexities of human needs and societal impacts. Systematic compassion, as Reineke defines it, involves creating deep, comprehensive understanding maps—relationship, journey, and assumption maps—that help innovators identify friction points in user experiences and intercept issues early. This approach is designed to not only meet user needs but also benefit broader ecosystems, aligning with both social good and business goals. Reineke provides several case studies, such as the implementation of digital pathology and clean energy initiatives, where stepping back and applying systematic compassion turned struggling projects into major successes. For instance, in one project, converting patient data into usable formats created a new market for cancer detection models. In another, her team used generative AI to simplify complex electrification initiatives, making them more accessible to everyday consumers. Reineke argues that blending agile methodologies, UX design, and storytelling with systematic compassion ensures that technological solutions are effective, ethical, inclusive, and scalable for widespread societal benefit.
6. ISSIP Survey - In the ISSIP community there is clear consensus that the inventor or creator of an innovation is the one primarily responsible for ensuring the safety of that innovation. But there is a clear contributing role for government bodies. And ultimately it is up to all of us to ensure that there are governing rules and norms, and that those rules guide behavior toward tech deployment for good and not evil.

Section 4: Survey Results

In preparation for the Discovery Summit event, ISSIP fielded a survey among its global community, as well as Discovery Event registrants to collect insights around “Tech for Good”. Following are the findings, as shared by ISSIP Executive Director Michele Carroll to kick off the Summit conversation.

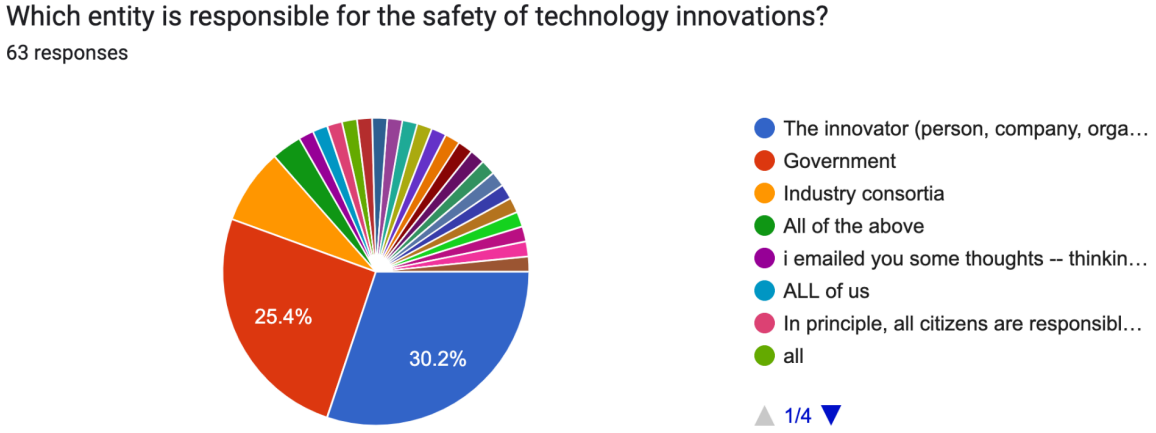
Question 1: Which is moving faster today? Technology benefits or harms?



More than two-thirds of survey respondents view the benefits of technology innovation moving faster than the harms.

But there is a solid 30%, saying that the harms of technology innovation are outpacing the benefits - and a very small sliver think harms and benefits are moving at about the same pace.

Question 2: Which entity is responsible for the safety of technology innovations?



When asked who, which entity is responsible for the safety of technology innovations, nearly one third of respondents from the ISSIP community see the innovator (person, company, organization) which created the innovation, as the one which should be responsible for safety. A quarter of all respondents answered that the government has responsibility for safety, and only 8% suggested that industry consortia are responsible for the safety of technology innovations. Interestingly, however, the slivers of individual write-in responses represented in the chart below expressing ‘all of us,’ ‘all citizens,’ ‘really everyone is responsible,’ tally up to a total of 26% or the second largest portion of respondents saying that **all of us** are actually responsible for tech innovation safety.

Question 3: What kinds of innovations offer the most promise in terms of potential benefits? What kinds are the most threatening in terms of potential harms?

Data Summary: Overall, across a total of 59 respondents submitting write-in answers to this open-ended set of questions, there was mention of innovations that produce both harm and benefits in many different aspects of life.

- The most common answer for a harmful innovation was AI, but it was also considered the most beneficial.
- Especially in improving cybersecurity, addressing environmental issues, advancing medicine, and making society better overall.
- Many saw AI as promising, but raised concerns about the negative aspects of AI innovation, such as its potential use as a weapon, possible harm to the environment,, ethical issues and disinformation.
- This highlights the complex nature of innovation, especially in the AI field, where we need to carefully consider both the positives and negatives of tech innovation.

For more information on the methodology, analysis and specific findings by the four CSULB student teams, see Appendix II
To view write-in responses, click here:
https://docs.google.com/forms/d/1bUSoxNZm0zNTrMqHO0ZzD-plPBf6Qgd_8t2npn7RxdM/edit#responses

Section 5: Position Statements

Do you have a "Tech for Good" position statement to share?
Anhuja (2023) - Long-term ideal visions may blind some from short-term harms *"People who are very rich or very clever, or both, sometimes believe weird things. Some of these beliefs are captured in the acronym Tescreal. The letters represent overlapping futuristic philosophies — bookended by transhumanism and longtermism — favoured by many of AI's wealthiest and most prominent supporters. The label, coined by a former Google ethicist and a philosopher, is beginning to circulate online and usefully explains why some tech figures would like to see the public gaze trained on fuzzy future problems such as existential risk, rather than on current liabilities such as algorithmic bias. A fraternity that is ultimately committed to nurturing AI for a posthuman future may care little for the social injustices committed by their errant infant today."*

Renee Yao, NVIDIA (Speaker)
NVIDIA leverages AI to drive global change. We're revolutionizing healthcare with early, personalized diagnoses in imaging, instruments, drug discovery, genomics, and analytics; and using AI to combat climate change through optimized energy efficiency and predictive weather modeling. Together, we're innovating for a healthier, sustainable future.

Michele Carroll, Executive Director - ISSIP
Any tool can be purposely used for good or ill. Tech for Good seems less about the tech and more about the ethics of its deployment. It is a call at a minimum, for ethical use of high powered tech to 'do no harm,' which requires thoughtful intention around its use to anticipate and neutralize harms so that benefits outweigh them. An objective third party unrelated to the invention or innovation may be better positioned to assess potential unintended impacts of the technology on a given system or populations. Perhaps that third party could serve as a final hurdle an innovator must 'clear' before launching to the general public -- or serve as an interim developmental step - a 'systems' impact review step along with the innovator inside a design test phase.

V Kharchenko *Yes. My main research and innovation activities are related to safety and security for critical areas and the T4G position is useful, important and resonates with my experience, position and aspirations.*

Debra Satterfield, Design Department Chair, CSU Long Beach, CA
First, do no harm.

Terri Griffith, Past President ISSIP (2022); Innovation Chair, Simon Fraser University, Vancouver, CN

Terri Griffith, Simon Fraser University, Vancouver BC (Past President ISSIP)
We all need to "Think in 5T." Organizations and work that thoughtfully combine talent, technology, and technique -- all aligned to meaningful targets and our times -- will bring us benefits and help us avoid harm.

Kazuyoshi Shimada, JST
I am still considering what is good. The statement of good will connect the statement of tech for good.

Jim Spohrer, ISSIP Co-Founder, Board Director; retired IBM
Beyond "Tech for Good" is "Complexity for Good". With nearly 10 billion people now on a fragile planet - we need to better understand the complex world we co-create with others every day. Regarding AI harms, people do not like to be fooled - throughout history that has been true. These two topics - "Complexity for Good" and "People do not like to be fooled" - are jumping off points for discussions.

Sally Squires
Tech has the great promise of making life better and the great peril of taking away our rights and spreading lies. We must navigate the future carefully and thoughtfully.

Paul Propster
with tech, harm always follows good...we must minimize the harm, while protecting and growing the good.

Warner de Gooijer, Cisco (ISSIP Board)
Challenged by the title because we see so much tech in the ongoing war.

Jana Markowitz
I *believe tech is created with its benefits in mind. However, we have many greedy, unethical people in the world who will twist any innovation to give themselves power, control and wealth. Perhaps we need to work more on teaching, and enforcing, ethics and kind behaviors to others across all of humanity rather than trying to legislate how tech tools are used. Both approaches are intimidating, potentially impossible tasks.*

Simon Kwok
Tech will be used for good if humans do not outsource our destiny to tech. Advancement in thought leadership concerning the ethical use of technologies will need to accelerate to ensure practical frameworks and artifacts to support the safe and ethical use of technologies in the age of rapid advancement in technologies with potential harmful impact.

Shelby M Trainor
Technology in a constantly innovating and changing world can be regulated to ensure safety and security for all.

Paulo Acuellar
Let us create tech for the sake of improving humanity and our global footprint, NOT for profit.

Rama Akkiraju, NVIDIA (ISSIP Strategy Council)
As an industry AI practitioner, I firmly stand for leveraging artificial intelligence in alignment with the 'Tech for good' movement. I advocate for responsible AI development, placing transparency, fairness, and accountability at the core of our initiatives. By adhering to these principles, we can harness the power of AI to create a positive, equitable, and sustainable future for society.

F Stein
“We are all in this together “

Mauricio Manhaes, ISSIP Ambassador
"Teks" is a Proto-Indo-European root meaning systematic fabrication or craft. "Ghedh", from the same root, means to unite and belong together. The systematic fabrication of union is a powerful statement in itself.

Sakar Bajagain
Tech with a Conscience: For a Better World.

Abby Moliski
Privacy, Social Media, Nuclear Weapons

Atul Gupta
Tech for good is encapsulation of services with benefits to humanity and nature.

Nidhi Sharanya
Technology can be as powerful or as harmful as humanity decides it to be. It is up to the individual to decide whether they will use the resources of today to build a better tomorrow.

Peter Jay Sorenson
Tech for Good will only happen if we approach it from both deliberate and improvisational perspectives.

Frank Odasz, Lone Eagle Consulting Specializing in rural, remote, and Indigenous learners.
What's the best good people can learn to do online for themselves and others? This is the question I've pursued for the last 40 years. Includes identifying what motivates people to embrace the power of all of us through effective good-natured encouragement and support of others as we all grow our individual, and collective, skills and grow our joint understanding of the societal importance of building

collaborative community capacity. I've taught citizens and teachers online courses evolving since 1987 combining the Big Picture vision along with skills for learning and teaching online, including mentorship. The tech and the world kept changing. Now, we need a refresh, aided by AI, on the stewardship of all citizens to support our one human family and the delicate balance of our precious planet as our only home. Inaction over the last half century has created the dire need for unity and action. Everything I've written and created is online to be shared without restriction.

Shahsiah (2023) Some personal reflections based on ISSIP Discovery SummitS October 14, 2023. ISSIP "Tech for Good" whitepaper.
"On the road to doing perfect at AI, we are facing who is responsible for the case of negative or positive at different levels? Who are the actors who can be most influential and give a voice to the Good? A crucial outline of the diverse range of issues appeared during the "Tech for Good" panel discussion, in addition to findings presented from the survey conducted by ISSIP to give participants an opportunity to express their opinions and contribute to further work on this important and timely topic. According to the survey, most participants are positive toward Technology. Being optimistic toward Technology shown by the ISSIP survey outputs, relies on the prolific experiences of many who play an empathetic role in society as a whole and a part.Trendy topics in this field are changing day to day and selected to go through it in depth by the taste of the audience. Real-world projects navigate the path of the work to the optimum point of the Good in Tech by defining the Good for each project. Focusing on the Good is not a perfectionist approach. While Technology is Good by the outer eye, it works for Good instinctively, naturally and physically as well!"

Ahuja, Anjana (2023) May 9, 2023. Opinion Artificial intelligence. Financial Times. Via_Web_Search. URL: Quotes: *"The futuristic philosophies favoured by AI's most prominent supporters ignore the issues we should be grappling with now."; "People who are very rich or very clever, or both, sometimes believe weird things. Some of these beliefs are captured in the acronym Tescreal. The letters represent overlapping futuristic philosophies — bookended by transhumanism and long termism — favoured by many of AI's wealthiest and most prominent supporters. The label, coined by a former Google ethicist and a philosopher, is beginning to circulate online and usefully explains why some tech figures would like to see the public gaze trained on fuzzy future problems such as existential risk, rather than on current liabilities such as algorithmic bias. A fraternity that is ultimately committed to nurturing AI for a posthuman future may care little for the social injustices committed by their errant infant today.;*

Anonymous

- *How about this. Tech for good serves all of humanity, not just the "well-connected." You are welcome to follow-up with me - Ray Fisk*
- *Avoid hypes and avoid technology innovation ban while considering benefits and harms.*
- *Responsible entities learning centres*

● *We are in an age with 5th generation technology and 2nd generation societal and organizational designs. Working with this advanced technology, we need to up our 'game' very substantially to augment the human and efficacy dimensions of sociotechnical systems, at the micro, meso, and macro scale.*
● *Tech for good needs to figure out exactly how technology can be controlled, managed and curtailed in some way. The status of AI now is such an example. Our current - let the market decide approach does not work, because there really are no open markets. Companies and even individuals are trying to aggregate control over resources which leaves many in desperate situations because no free competitive market exists.*
● *My "Tech for Good" is what we call a "Learning effect" or Intelligence Augmentation (IA), when humans interact with machines, especially advanced ones like AI, their interpretative capability seems to be "empowered".* ● *So we could say: IA is the empowered human's interpretative capability in decision making processes during the interaction with AI.* ● *So it is important to investigate the "learning effect" (kind of reaction/behaviour/schema) that derives from human-machine interaction which can be different according to human's variety.*
● *Social media and desinformation - AI and warfare (cyber and physical).*
● *Tech should promote the enactment of human agency (Nila Windasari; nila.armelia@sbm-itb.ac.id)*
● *We need to embrace AI in all aspects of human life*
● *We are currently in the safest and most prosperous era in history, and I'm confident Tech For Good will only grow stronger and more prominent in our community.*
● *We do not have a specific 'tech for good' position statement. We often talk about technology augmenting human tasks, freeing people up to be creative, innovative, and focused on the human relationship.*
● *More questions: Good tech should be tech to enhance our capacities and help folks especially in need of special support.* ● *- Tech for good movement must show itself and how it can be a teacher to enhancing media literacy with examples* ● *- Discern good Tech v dangerous Tech in the public sphere. When is it good to have an analogue back up system to prevent activity for example.* ● *- How to balance digital and analogue in early childhood interactions and engagements. When does too much Tech become bad for the brain / humanness* ● *- What are dangers or pluses of AI (breaking down dystopian scenarios)*
● *smart technology as enabler of social innovation practices*
● *Tech for Good is Solving Global Challenges and Improving Quality of Life.*

Section 6: Concluding Remarks: Additional Questions

What is the major technology trend you are working on or tracking?
Explain how you think about the benefits and potential harms?
Who is responsible for ensuring benefits are realized and harms are mitigated?
How should students be prepared to understand the benefits and harms of trending technologies?
For each of the historic innovations, what were the primary benefits and harms?

Questions for Carlotta:

1. Won't all of this – assembling and working in a multidisciplinary team, inclusion of social behavioral sciences from the beginning, diversity equity and inclusion - just slow us down?
2. I took a couple of courses in psychology and sociology – isn't that enough?

References

BiblioA2023

Biblio 2019 Al Sharq Youth (2023) Debate: Artificial Intelligence Brings More Harm than Good. Via_YouTube. URL: https://youtu.be/MZWOF9EcyHg?si=AigecEi31mds6CAX Quotes: "Al Sharq Youth - 44.8K subscribers; 64,067 views Oct 15, 2019. For more info, visit our website - https://youth.sharqforum.org/";

Equity and Excellence: A Vision to Transform and Enhance the U.S. STEMM Ecosystem (2022) https://www.whitehouse.gov/ostp/news-updates/2022/12/12/equity-and-excellence-a-vision-to-transform-and-enhance-the-u-s-stemm-ecosystem/ Retrieved September 13, 2023.

National Academies of Sciences, Engineering, and Medicine (2023). *Advancing Antiracism, Diversity, Equity, and Inclusion in STEM Organizations: Beyond Broadening Participation*. Washington, DC: The National Academies Press. https://doi.org/10.17226/26803

National Academies of Sciences, Engineering, and Medicine. 2015. *Enhancing the Effectiveness of Team Science.* Washington, DC: The National Academies Press. https://doi.org/10.17226/19007.

National Academies of Sciences, Engineering, and Medicine and National Academy of Medicine. 2023. *Toward Equitable Innovation in Health and Medicine: A Framework*. Washington, DC: The National Academies Press. https://doi.org/10.17226/27184

The White House Office of Science and Technology Policy Launches "The Time is Now: Advancing Equity in Science and Technology Ideation Challenge" (2021). Retrieved from

https://www.whitehouse.gov/ostp/news-updates/2021/10/14/the-white-house-office-of-science-and-technology-policy-launches-the-time-is-now-advancing-equity-in-science-and-technology-ideation-challenge/
Retrieved September 13, 2023.

Wailoo, KA, Dzau, VJ. Yamamoto, KR. (2023). Embed equity throughout innovation. *Science*, Vol. 381(6662), pp. 1029. https://www.science.org/doi/epdf/10.1126/science.adk6365

Why Social Science?
https://www.whysocialscience.com/blog/2021/3/23/because-engineering-is-intended-to-benefit-society
Retrieved September 15, 2023.

* BiblioM2019 Bighin J, Hazan E, Allas T, Hiartar K, Manyika J, Spatial PE, Shigina I (2019) Tech for Good: Smoothing disruption, improving well-being. McKinsey Global Institute. Discussion Paper. Jacques Bughin, Brussels; Eric Hazan, Paris; Tera Allas, London; Klemens Hjartar, Copenhagen James Manyika, San Francisco Pal Erik Sjatil, Paris; Irina Shigina, London. URL:
https://www.mckinsey.com/~/media/mckinsey/featured%20insights/future%20of%20organizations/tech%20for%20good%20using%20technology%20to%20smooth%20disruption%20and%20improve%20well%20being/tech-for-good-mgi-discussion-paper.pdf [mckinsey.com]

BiblioM2023 Marconi Society (2023) Fifty Years Ago and In the Future. The Marconi Society (115 Subscribers on YouTube with 167 views Streamed live on Aug 16, 2023).
Via Frank_Odasz.
URL:

Quotes: "Fifty years ago, Vint Cerf and Bob Kahn sketched out ARPA's TCP/IP internetworking protocol, the foundation for the Internet, Marty Cooper made the first cellphone call, and Federico Faggin led the development of the "8008," the first 8-bit microprocessor that sparked the personal computing revolution. Each of these innovators – all Marconi Fellows – is still working hard to create the future. Attend this landmark event to hear stories, insights, and predictions for the future in an open discussion with questions and answers.

PANEL
Martin Cooper, Dyna LLC, 2013 Marconi Fellow
Vint Cerf, Google, 1998 Marconi Fellow
Federico Faggin, The Federico and Elvia Faggin Foundation, 1988 Marconi Fellow
MODERATOR
Yasaman Ghasempour, Assistant Professor of Electrical and Computer Engineering at Princeton / 2020 Marconi Young Scholar

Appendix I: Summary of Survey Data Analytics by Debra Satterfield, Design Department Chair, CSU Long Beach (and Lead of ISSIP AI Collab)

Four undergraduate student groups in a User Experience Design Research course analyzed the two qualitative response questions to the ISSIP member survey. The students were tasked with using a grounded theory approach to cleaning the data, developing codes, and analyzing the data. Using the same data sets, the following four coded outcomes were developed.

Team One

Data Summary: Overall, across a total of 59 respondents, innovations produce both harm and benefits in many different aspects of life. The most common answer for a harmful innovation was AI, but it was also considered the most beneficial. There were other answers that are worth highlighting -- there seems to be a lot of social impacts that come with innovation, as the second category with the most related responses. Overall, I feel like there was a sense of worry among all the respondents in their answers. A few sounded hopeful when asked about innovations, but many had answers in which certain innovations were on the fence of being both harmful and beneficial.

Codes

Social : Innovations that impacts social relations and humans, 11 respondents
Environment : Innovations that affect the environment, 3 respondents
Health : Innovations that affect health and the medical field, 6 respondents
AI : Innovations that incorporate artificial intelligence, 31 respondents
Tools : Innovations that are used as tools, technologies, and resources, 15 respondents
Ethics : Innovations that concerns its ethical uses, 6 respondents
Human limitations : Innovations that contribute to human limitations, 6 respondents

Connections and Data Interpretation: The Tools and Human Limitations are kind of connected since they both deal with innovations (tools, resources, technology, etc.) that affect assisting human tasks. AI can also be connected to these categories since they can power some of these tools.Social and Ethics are two other categories that are connected since the ethics of innovations can concern human wellbeing.



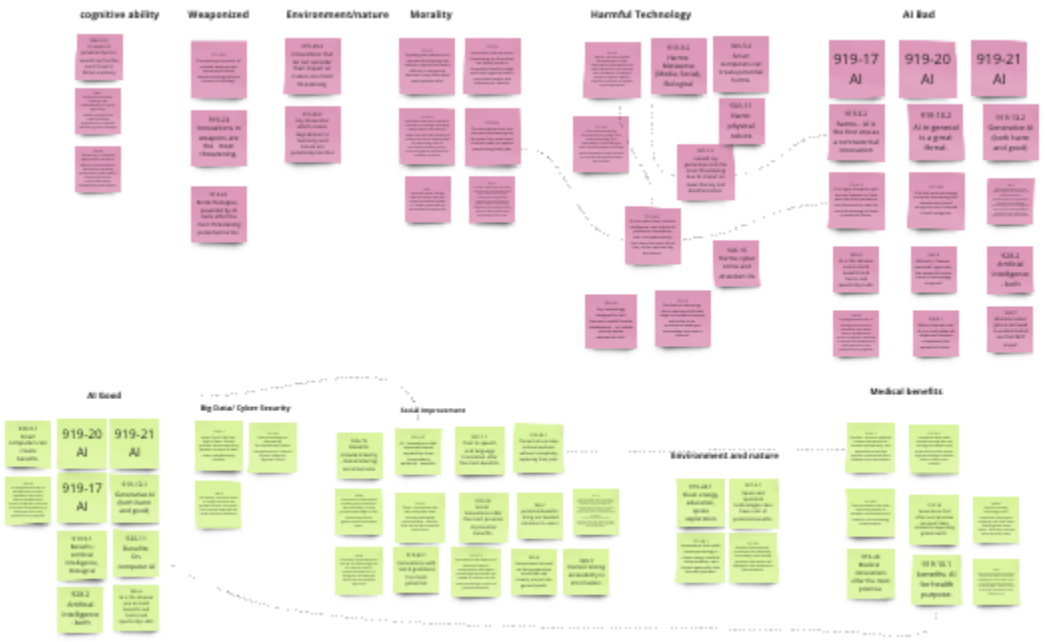
Team Two

Data Summary Generated with ChatGPT: In a survey with 60 responses, people talked about the good and bad sides of innovation, with a focus on Artificial Intelligence (AI). Many saw AI as promising, especially in improving cybersecurity, addressing environmental issues, advancing medicine, and making society better overall.

However, concerns were raised about the negative aspects of AI innovation, such as its potential use as a weapon, possible harm to the environment, and ethical issues. Some respondents took a middle-of-the-road stance, saying that while AI seems to offer a lot of benefits, it also poses significant risks. They expressed the idea that AI has both the most potential for good and the most threats in terms of potential harm. This highlights the complex nature of innovation, especially in the AI field, where we need to carefully consider both the positives and negatives.

Codes for Benefits
Big Data/ Cyber Security- safety surrounding big data, n= 2;
Environment/Nature- includes space exploration, clean energy, n= 4;
Medical benefits- innovation in the field of medicine with a goal to preserve health, n= 6;
AI Good- AI generalized as a positive innovation, n= 5;
Social Improvement- Innovations meant to improve quality/ efficiency of jobs, or meant to improve the global society, n= 6.

Codes for Harms
Weaponized: AI that are developed as warfare weapon or for destruction purpose, n= 3;
Environment/Nature: AI that causes potential damage to the environment and nature, n= 2;
Morality: unethical innovations, n= 6;
General Harm: technology that could cause potential harm to individuals and society, n= 8;
AI Bad- AI generalized as a negative innovation, n= 15;
cognitive ability- tech innovations seen as harmful by narrowing human perspectives, n= 3.



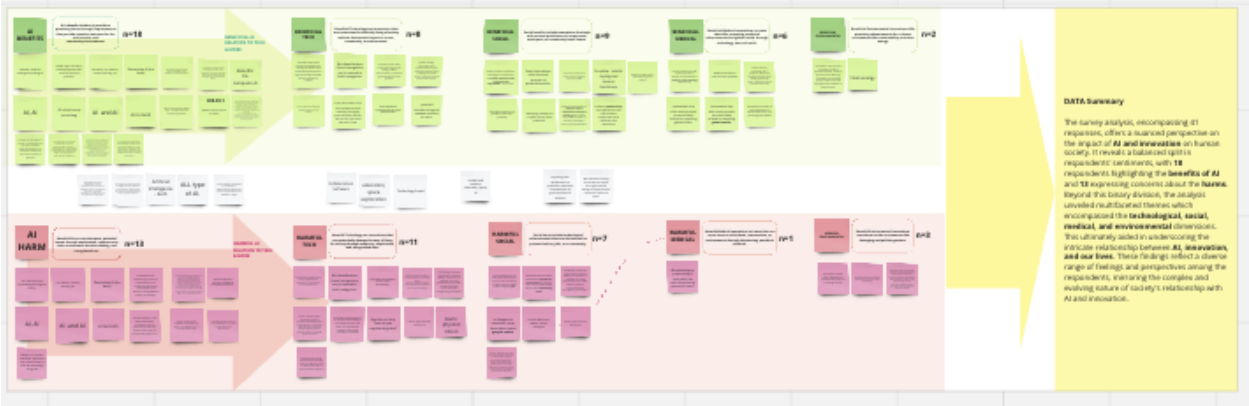
Team 3

DATA Summary : The survey analysis, encompassing 41 responses, offers a nuanced perspective on the impact of **AI and innovation** on human society. It reveals a balanced split in respondents' sentiments, with **18** respondents highlighting the **benefits of AI** and **13** expressing concerns about the **harms**. Beyond this binary division, the analysis unveiled multifaceted themes which encompassed the **technological, social, medical, and environmental** dimensions. This ultimately aided in underscoring the intricate relationship between **AI, innovation, and our lives**. These findings reflect a diverse range of feelings and perspectives among the respondents, mirroring the complex and evolving nature of society's relationship with AI and innovation.

Codes for Benefits
AI Benefits : AI is beneficial when it provides a promising future through improvements that provide a positive outcome for the user, service, and community/environment, n=18;
Beneficial Tech: Beneficial Technology are innovations that are convenient for the daily living of society without detrimental impact to a user, community, or environment, n=8;
Beneficial Social : Social benefits include innovations that help with societal problems such as personal, workspace, or community based issues, n=9;
Beneficial Medical : Beneficial Medical innovations are ones that offer promising medicinal advancements and global health through technology, one such as AI, n=6;

Beneficial Environmental : Beneficial Environmental innovations offer promising advancements for a cleaner environment like sustainability and clean energy, n=2.

Codes for Harms
AI Harm : Harmful AI are ones that pose potential harms through exploitation, cybersecurity risks, autonomous decision-making, and unregulated use, n=13;
Harmful Tech : Harmful Technology are innovations that can potentially damage the way of living for society through weaponry, exploitation, and unregulated data, n=11;
Harmful Social : Social harm include technological advancements that are detrimental to personal values, jobs, or a community, n=7;
Harmful Medical : Harmful Medical innovations are ones that can cause harm to individuals, communities, or environments through threatening, unethical methods, n=1;
Harmful Environmental : Harmful Environmental innovations cause harm to the environment like damaging and polluting nature, n=3.



Team 4

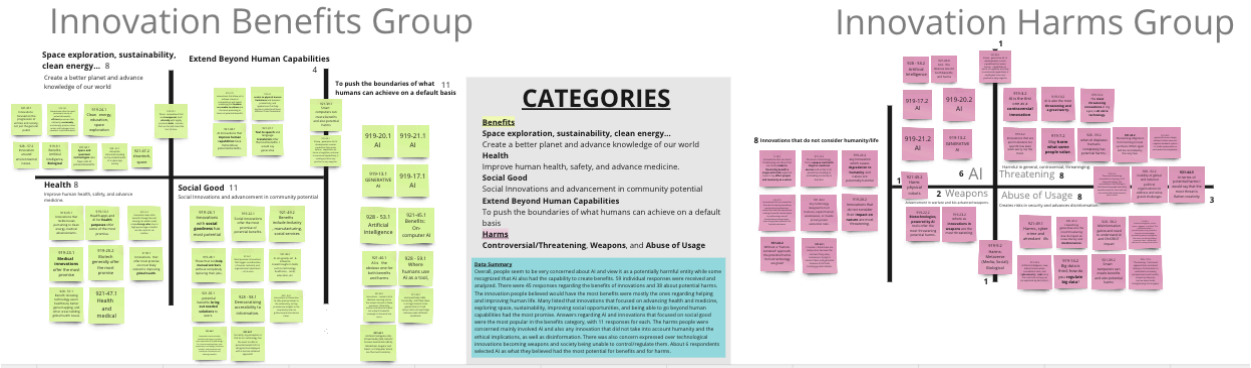
Data Summary : Overall, people seem to be very concerned about AI and view it as a potentially harmful entity while some recognized that AI also had the capability to create benefits. 59 individual responses were received and analyzed. There were 45 responses regarding the benefits of innovations and 38 about potential harms. The innovation people believed would have the most benefits were mostly the ones regarding helping and improving human life. Many listed that innovations that focused on advancing health and medicine, exploring space, sustainability, improving social opportunities, and being able to go beyond human capabilities had the most promise. Answers regarding AI and innovations that focused on social good were the most popular in the benefits category, with 11 responses for each. The harms people were concerned mainly involved AI and also any innovation that did not take into account humanity and the ethical implications, as well as disinformation. There was also concern expressed over technological innovations becoming weapons and society being unable to control/regulate them. About 6 respondents selected AI as what they believed had the most potential for benefits and for harms.

Codes for Benefits :

Space exploration, sustainability, clean energy… Create a better planet and advance knowledge of our world, n=8;
Health : Improve human health, safety, and advance medicine, n=8;
Social Good : Social Innovations and advancement in community potential, n=11;
Extend Beyond Human Capabilities : To push the boundaries of what humans can achieve on a default basis, n=4;
To push the boundaries of what humans can achieve on a default basis, n=11.

Codes for Harms :

Controversial/Threatening, **Weapons**, and **Abuse of Usage**
Innovations that do not consider humanity/life, **n=8;**
AI : n=6;
Weapons : Advancement in warfare and bio advanced weapons, n=2;
Threatening : Harmful in general, controversial, threatening, n=8;
Abuse of Usage : Creates risks in security and advances disinformation, n=8.



Tech for Good Position Statements

A second qualitative response question, “Do you have a "Tech for Good" position statement to share?” in the ISSIP member survey received 59 responses. The CSULB undergraduate student teams were asked interpret this data by cleaning and coding the data based on the responses. They were also required to list the codes (Categories) they developed and give a brief statement of explanation for the category and what it indicates or the common themes in the categories along with the number of respondents. Each team was also asked to give an overall summary that contextualizes the categories in terms of most to least represented and any linkages or relationships between categories in the Tech for Good position statements.

Team One

Overall Summary: Overall, across a total of 59 respondents, the Tech for Good sentiment varies, largely in terms of positive or negative outlooks. There are other categories of outlooks as well that are prevalent, such as the ethical concerns, humanity concerns, need for

understanding, need for unity, and a small percentage remains for those who are unsure of their position. Those who see technology as good mainly mentioned how AI and other technology is great for efficiency and an overall improvement in life. Those who saw bad, on the other hand, are mainly concerned about how technology can be used immorally, such as for war, abuse of power, and security breaches. The other categories tap more into the other aspects of life, such as impacts to health, interactions between humans, and questioning our complete grasp on the idea of incorporating technology in our lives.

Tech for Good Philosophy Statement Categories:

Unsure : Those who are unsure of the topic, n = 1;
Sees Good : Those who see good in what comes out of technology, n = 10;
Sees Harm : Those who see bad in what comes out of technology, n = 7;
Ethical Concerns : Those who focus on the ethical use of technology, n = 5;
Humanity Concerns : Those who focus on the relationship between technology and humans/humanity, n = 8;
Need for Understanding : Those who suggest that we need a better understanding of technology and the world around us in order to confidently incorporate technology into our lives, n = 10;
Need for Unity : Those who suggest that we need unity among us humans first and foremost, n = 3;



Team Two
Summary Statement : Overall, many respondents had differing ideas of what they were wanting to propose as their position statement centering around Tech for Good. These responses varied from tech promoting unity, cautionary steps that will be needed to be taken for the good of humanity, how tech can benefit humanity, and more questions about tech for good that have come up within the survey. In conclusion, although all of these responses did have differing opinions, they are all important to look into and understand for the future of tech and humanity.

Codes

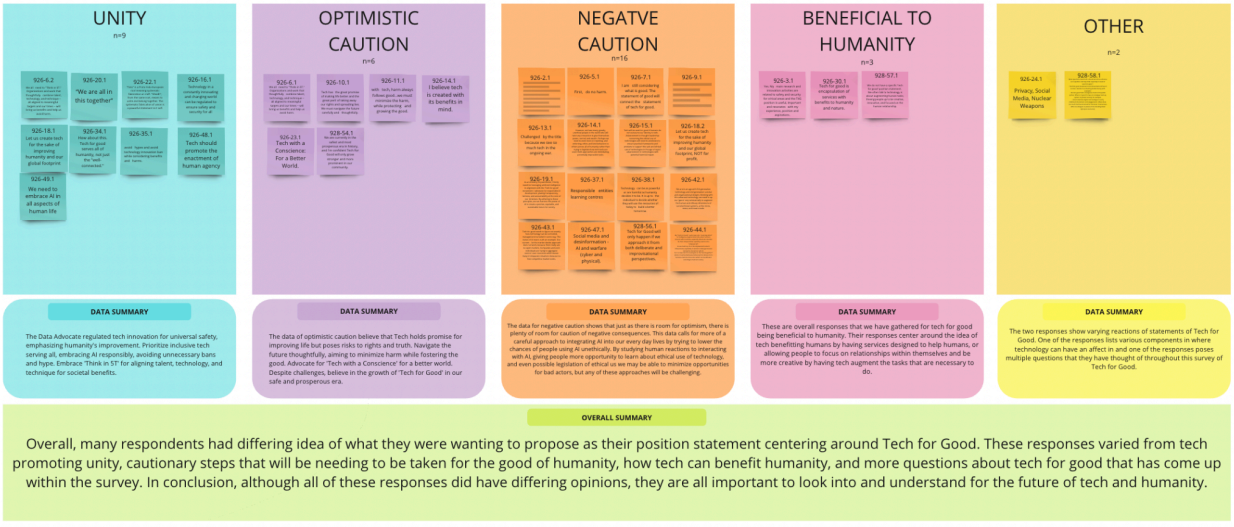
Unity : The Data Advocate regulated tech innovation for universal safety, emphasizing humanity's improvement. Prioritize inclusive tech serving all, embracing AI responsibly, avoiding unnecessary bans and hype. Embrace 'Think in 5T' for aligning talent, technology, and technique for societal benefits. n=9;

Optimistic Caution : The data of optimistic caution believe that Tech holds promise for improving life but poses risks to rights and truth. Navigate the future thoughtfully, aiming to minimize harm while fostering the good. Advocate for 'Tech with a Conscience' for a better world. Despite challenges, believe in the growth of 'Tech for Good' in our safe and prosperous era. n=6;

Negative Caution : The data for negative caution shows that just as there is room for optimism, there is plenty of room for caution of negative consequences. This data calls for more of a careful approach to integrating AI into our everyday lives by trying to lower the chances of people using AI unethically. By studying human reactions to interacting with AI, giving people more opportunity to learn about ethical use of technology, and even possible legislation of ethical us we may be able to minimize opportunities for bad actors, but any of these approaches will be challenging. n=16;

Beneficial to Humanity : These are overall responses that we have gathered for tech for good being beneficial to humanity. Their responses center around the idea of tech benefiting humans by having services designed to help humans, or allowing people to focus on relationships within themselves and be more creative by having tech augment the tasks that are necessary to do. n=3;

Other : The two responses show varying reactions of statements of Tech for Good. One of the responses lists various components in which technology can have an effect and one of the responses poses multiple questions that they have thought of throughout this survey of Tech for Good. n=2.



Team Three

Data Summary : In analyzing the Tech for Good position statements, we have categorized the responses into three main groups: **Optimistic, Neutral, and Cautious**. Each group offers a distinct perspective on the future of technology and its impact on humanity.

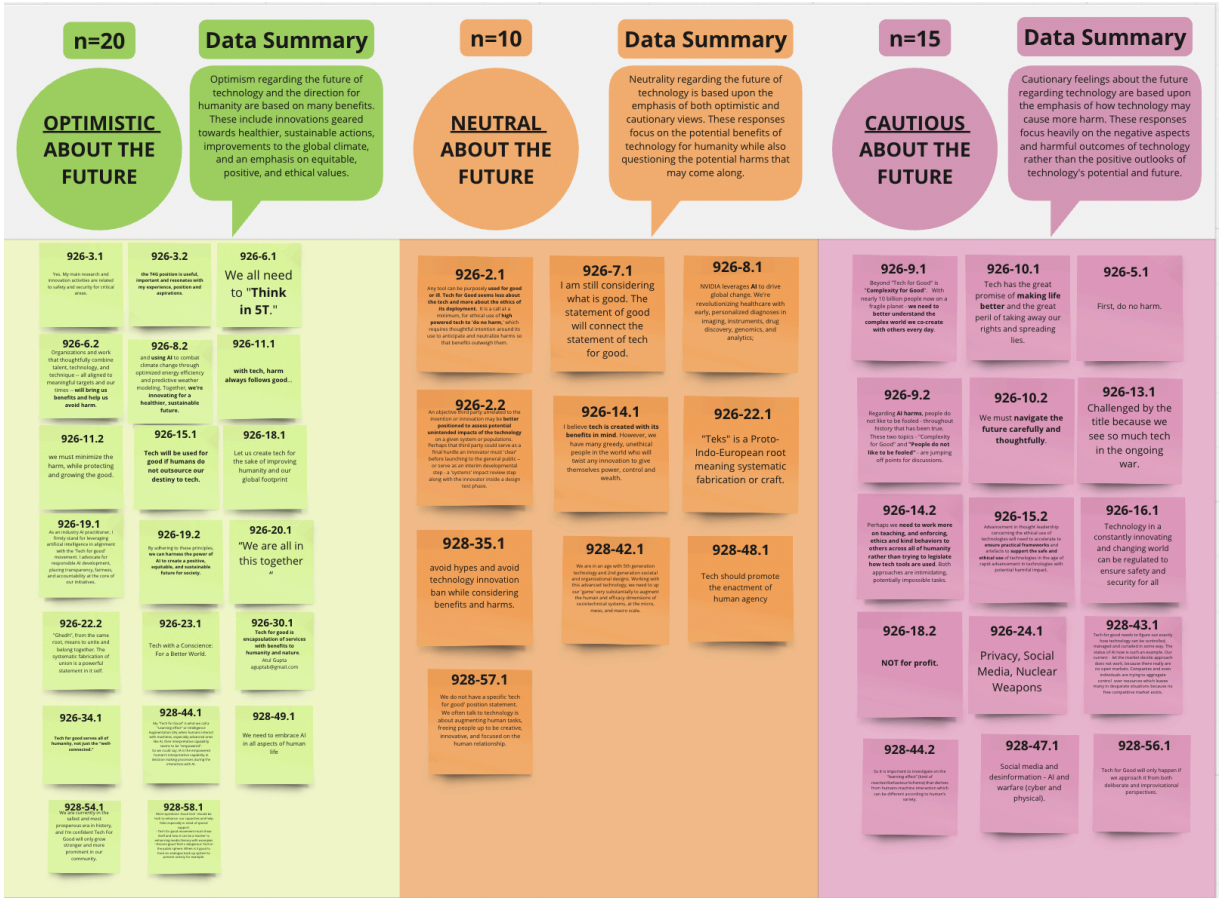
Codes
Optimistic : The largest group among the respondents is the Optimistic group. These individuals express a strong belief in the potential of technology to bring about positive change for society. They are enthusiastic about the innovations that technology can offer, such as advancements in sustainability, climate action, and ethical values. Optimists highlight the benefits of technology, emphasizing its role in improving people's lives and addressing global challenges. Their outlook is characterized by hope and a desire to harness technology for the greater good.

This group aligns with the notion that technology can be a force for positive transformation, echoing the sentiments found in interviews with tech leaders and experts who envision technology as a tool for solving pressing global issues. n=20;

Neutral : The Neutral group occupies a middle ground, balancing both optimistic and cautious perspectives. They acknowledge the potential benefits of technology for humanity but also express concerns about the potential harms that could arise. It also resonates with the idea that technology should be viewed as a tool that can yield both positive and negative outcomes, depending on its application. n=10;

Cautious : The Cautious group represents individuals who are predominantly concerned about the negative impacts of technology. They emphasize the potential harms, risks, and ethical dilemmas associated with technology's unchecked growth. Cautious respondents are wary of the consequences of irresponsible tech development, including issues related to privacy, misinformation, and societal inequality. Their apprehension aligns with the precautionary principle, where the potential for harm takes precedence, and they stress the need for robust safeguards and regulation.

Overall, there is a diversity of perspectives on the role of technology in shaping the future. Optimists are hopeful and envision technology as a force for good, while those in the Cautious group emphasize the need for vigilance and ethical considerations. The Neutral group strikes a balance between these extremes, recognizing both the potential benefits and risks associated with technology. These positions reflect a broader societal discourse and echo themes found in expert interviews and relevant literature, emphasizing the importance of responsible and ethical technology development for the betterment of humanity. n=15.



Team Four

Overall Summary : Overall, the responses indicate that the respondents are almost evenly split, with 14 responses having a position that has an optimistic view of tech for the future and 14 having a cautious view, raising their concerns. About five responses expressed having a neutral outlook. 15 responses named ways and actions that could help promote safe, ethical ways of dealing with technology, such as creating responsible entities learning centers or promoting enactment of human agency. In conclusion, the respondents expressed having mixed views towards the idea of "Tech for Good'.

Code Summary:
Optimistic): Projects a positive outlook towards new technologies and innovations effect on the world in the future, n=14;

Neutral : Saw both sides of the potential of tech for good or for harm, n=7;

Cautious : Had a negative outlook or wanted people to be careful in the future, n=14;

Actionable data : Suggested ideas on what actions people should take, such as enforcing laws or regulations, n=15.



Data Coding Methodology

For each of the two qualitative responses, the four student teams used the same raw data to code based on making associations between the responses. In some cases, a single response included several thoughts that may have been aligned with different codes. Therefore, the response data was numbered and broken into thoughts in ways that could capture all of the data in a representative fashion without over generalization or forcing the data to align with only one aspect of the response. This first phase of data coding was done by each of the groups prior to the development of the final codes. Null responses were also identified so that an accurate response number could be recorded for each question.



The second phase of data coding required the students to identify themes in the data and determine if the data was essentially positive or negative in the view represented. The students then aligned the responses into themes that are unique to each student group. Interestingly, the final coding and data interpretations, while unique and different, all represent a legitimate lens on the raw data for these qualitative responses.



Appendix II: Event Audio Transcript and Chat Commentary

WEBVTT

Michele Carroll (ISSIP): Good afternoon, and good evening, and good morning. Thank you so much. You have found ISSIP's annual Discovery Summit, where we do a deep dive on a topic of interest to the Isop community. And our topic this year is technology for good.

I'm Michele Carroll, executive director of ISSIP, and I have just a short housekeeping detail, and then I'm going to turn it over for an official welcome from our President.

If everyone could please make sure your microphone stays muted. We do have 247 folks registered for today, and that could get a bit chaotic. So please do mute your microphone unless you are the speaker on screen.

And second, we really do encourage you to use the chat feature. You'll find at ISSIP events that the interaction going on in the chat can be one of the best parts of the event. It's where to make comments to ask your questions.

And you'll be finding links to resources and additional information there over the course of our time together. With that, let me turn it over to ISSIP's 2023. President, Utpa Mangla of IBM.

Utpal Mangla: Thank you very much, Michele. Good morning. Good afternoon, and good evening, team. A warm welcome.
As Michele mentioned. I'm the ISSIP President for 2023.
ISSIP exists because of our shared interest in understanding service innovation better.
And let me repeat that for impact. ISSIP exists because of our shared interest in understanding service innovation better and ISSIP provides recognition and awards for members all the way from students to retirees, to share and improve knowledge related to service innovation.

Thank you everyone for joining, and my special thanks to Deb Stokes, who is my partner in crime and is our ISSIP Vice President. Deb has been responsible for organizing today's discovery summit.

I am very excited to learn from the keynote and panelists about their views on today's topic, which is tech for good. Welcome everyone who has registered for the event. As Deb mentioned. or will be mentioning, we'll get a recording, slides and white paper. When it is ready. and team. It's not too late to add your own position, statement. and references to the white Paper.

Please take the short survey that Jim will post in the Link chat. Thank you very much again. And looking forward to today's session.

Back to you, Michele.

Michele Carroll (ISSIP) ISSIP is now a community of more than 1,600 people, representing 42 different countries, more than 400 entities. And today's a good example of the kind of blend of industry academia, academia, and NGO and government and their Logos are shown here today, too as an example for you.

We only have 2 hours together, and it's a jam-packed session. Here's how it's going to flow after that welcome by Utpal, and we are beautifully on time. I'm going to share a very brief look at preliminary findings from the survey that ISSIP has fielded over the summer on the topic of tech for good. And we are going to keep the collection open through the end of September, which is Friday.

So just a few more days. So again, you'll see that link in the chat to the survey. If you've not already completed it, please do. It should be a 5 min process for you, and we'd love to have your additional perspective in there. I'll share what we're learning so far to kind of set the stage for today's conversation among our panelists and then I'll turn it over to Deb. Stokes, who Utpal mentioned is ISSIP's Vice President and Chair of this year's Discovery Summit.

Deb will introduce our keynote speaker, who you see here is Carlotta Arthur, with the National Academies of Sciences, engineering and medicine, who will deliver a keynote on 'Multidisciplinary by Design'. And then there will be an opportunity there for you to ask Carlotta questions of Carlotta. Again through the chat there in your zoom. So please do engage with asking questions. There should be a good 10 min at the end of that half hour block and then Deb will moderate the conversation with our power panelists of executives and amazing people from NVIDIA, UC Santa Cruz Baskin school of Engineering, Meta and Shift5.AI

Deb Stokes, ISSIP VP/Dell Technologies: Thank you, Michelle. Thank you, Utpal. I also want to recognize the contributions for creating this Discovery Summit by Michele and Jim Spohrer, and if you don't know Jim is, then what rock have you been living under? Because everybody knows who Jim is. So just a thanks for all the contributions they've made. I'm Deb. Stokes, Vice President ISSIP, and also with Dell Technologies in the Office of the CTO. I'm responsible for our academic research portfolio, and I chair our internal technology exploration conference. And because everything has to have an acronym we call that TEX.

So we're going to talk about tech for good. And if you've noticed over the year, our ISSIP sessions have really been around this whole notion of tech for good, what new technologies always generate benefits that everybody is just so excited about. But underneath that, there's also some potential harms.

I have to share with you that everything that's been talked about and going on during 2023 is not a new concept. This is something that if you look back 55 years ago to the movie and novel 2001 Space Odyssey.

This is where a heuristically programmed algorithmic computer, affectionately known as HAL, makes some some really bad decisions and bad choices. I'm not going to spoil the plot for anyone who hasn't seen the movie or read Author C. Clark's book. But this is exactly what we are all fearing is going to happen right now. The machines will take us over. They will become intelligent. They will begin to think they will replace all of our jobs.

But I think one of the things that we want to focus on today is that we're going to talk about, how can we guide the development and design to better understand and implement across emerging and disruptive technologies to ensure that benefits will outweigh the potential harms. We know that innovation happens when there's cross collaborations across traditional science and engineering boundaries and disciplines. But we also know now that better innovation occurs when there is a diversity and equity included in those discoveries, and that includes collaboration across societal and behavioral sciences.

So with that, I am delighted to introduce our keynote address today, Carlotta Arthur is going to be telling us more about multidisciplinary by design - how we can leverage diverse teams to advance innovation and equity? Carlotta is the Executive Director of the United States National Academy of Science, Engineering and Medicine. I think I got all those right, and she is the Executive Director for the Behavioral and Social Sciences and Education Group. And with that., Carlotta, over to you and please feel free to add a few words of anything else that you think we should know about you before you start your presentation. Over to you.

Carlotta Arthur (National Academies/DBASSE): Thank you so much. Deb.

Hello, everyone as Deb shared. I'm Carlotta Arthur, executive director of the Division of Behavioral and Social Sciences and Education, or DBASSE. We love our acronyms at the National academies, too, at the National Academies of Sciences, engineering and Medicine.

It's really a pleasure to be here to have the opportunity to speak with you today. Thank you so much to ISSIP and to the Tech for Good Summit organizers. Deb, thank you, Michelle and Jim. Thank you so much for this invitation.

I'm actually a psychologist and an engineer by training. I have experience working across multiple sectors, including in industry, academia, and now at the National Academies. So I bring all of that experience and perspective to this topic of multidisciplinary by design, leveraging diverse teams to advance innovation and equity.

And before I dive into the talk. I'd like to start with an acknowledgement for the National Academies are located in Washington, DC. And we acknowledge that the National Academies, Kec Center, where my office is, and the National Academy of Sciences Building. Those of you who visit Washington. DC might remember the Einstein statue that's quite famous. That's the National Academy of Sciences Building.Those buildings are housed on the traditional lands of the Nakac, Anacosta people and Piscataway peoples, past and present.

We honor with gratitude the land itself and the people who have stewarded it through generations. We honor and respect the enduring relationship that exists between these peoples and nations and this land. We thank them for their resilience in protecting this land, and also aspire to uphold our responsibilities to their example.

As I shared my topic today is multidisciplinary by design, leveraging diverse teams to advance innovation and equity.

If you had a chance to review my full bio, I believe it may have actually been noted there that the National Academies has a long history of collaboration across the institution. If not, I will be highlighting that today. In fact, my division, DBASSE celebrated 60 years of social and behavioral sciences at the National Academies; yet many outside the institution aren't aware

that the National Academies has a division of social and behavioral science and education. Not only are these disciplines increasingly central to our work, but also their inclusion is often essential to ensure that we are doing the best science and providing the best possible advice on a topic.

So I'll start by sharing a little bit more during my talk today. My agenda is to share a little bit more about the National Academies and DBASSE. Then I'll provide a few key definitions to ensure that we're on the same page there. I'll spend some time talking more about what's at stake and why the inclusion of the social and behavioral sciences, diversity, equity, and inclusion matter, both in terms of multidisciplinary teams innovation, and also for tech for good.

Then I'll touch on some of the challenges to this work as well as a few strategies, to addressing these challenges that multi disciplinary teams and diversity, equity and inclusion might present. I'll wrap up by sharing a snapshot of some of the related and innovative work the DBASSE is or will be doing, moving forward.

The National Academies are private, nonprofit, are a private nonprofit institution that provides independent objective analysis and advice to the nation to solve complex problems and to inform public policy decisions related to science, technology, and medicine.

The National Academies are not a Federal agency. Nor do we, so do we receive funding directly from Congress for our work. The division of behavioral and social sciences, and education, or Dbass is one of the 7 program divisions within the National Academies. DBASSE advances the behavioral and social sciences and their application to policy and practice and advances evidence-based stem education.

The nature of our work is such that people are central. and that equity is often the key framework that underlies our work. DBASSE is home to 9 units plus special projects that include, for example, the science, engineering and technology equity Round Table, which we are in the process of standing up, the Board on Science Education. the Board on Human systems, Integration. the Board on Behavioral, Cognitive, and sensory Sciences.

:And if you're more, if you're interested in learning more about the work of the National Academies, and particularly of Dbass. I encourage you to visit our website **(Get link to website)** which is easily searchable, or to take note of this link. I understand that the slides will be shared. So you should have access to this link and the others that I'll share later

I could go on in talking more about DBASSE's entire portfolio of work. But there's a lot to learn about our works, so I would encourage you to visit our website.

So a few definitions. When I speak about multidisciplinary approaches, these are approaches that draw on knowledge from different disciplines. and each discipline makes a contribution in an additive way.

I myself am interdisciplinary, and that I bring both my perspectives from engineering and psychology and social sciences to my particular perspective. But multidisciplinary approaches don't really require that they don't require that you be an expert in the other discipline.

Rather, this is an approach that draws on knowledge from different disciplines with each discipline, making a contribution.And then another definition that's really important for our conversation today is that of equity.

So the National Academies office of diversity and inclusion defines equity as the absence of barriers, biases, and obstacles that impede equal access, fair treatment, and opportunity for contribution by all members of the community.

When many people think about diversity, they first think about racial and ethnic diversity. or perhaps gender diversity. However, diversity is much broader than that.

In fact diversity can be defined as the broad spectrum of experiences, cultures and physical attributes within a community including, but not limited to race or ancestry, ancestry, national origin, religion, age, gender, identity or expression, ability, sexual orientation, so socioeconomic status and perspective.

And increasingly in our work, geographic location, for example, rural or urban region of the nation, etc., is also being discussed as an important topic in diversity and inclusion, conversations

So in thinking about this work, what's at stake? Why, why are diversity, equity, and inclusion. Why is multidisciplinarity? Why do these things matter? Why are multidisciplinary teams and consideration of these things in our science and technology work important? So as Deb mentioned, there are some very high profile current examples of why this matters.

So, for example, the issue of AI, we're continuing to grapple with some of the conversations about AI. In spite of the fact that most of the people who answered the survey believe that technology for good is the primary right. Now, many of the conversations actually focus on the negative impacts of AI, for example. and I go on to speculate that this work could actually have benefited from more multidisciplinary teamwork involving the social and behavioral sciences and could have included more deep conversations about diversity, equity, and inclusion that hopefully could have preempted some of the negative conversations, or at least resulted in a more balanced conversation.

Unfortunately, many of the negative conversations about potential harms of AI are sort of drowning out some of the conversations around how this technology can be beneficial and how it can contribute to human thriving. Indeed, using an equity frame can help to ensure fair treatment, access, and opportunity, and it will broaden the demographics that must be considered included and heard during our innovative research and development and further addressing equity can increase trust in science and technology.

Here's another example of why multidisciplinary teams matter. We're reminded of the UN Sustainable Development Goals as the 2023 UN General Assembly wraps up, so pick a goal, any goal. There isn't a single sustainable development goal that can be addressed by one discipline, or even by a single sector acting on its own multidisciplinary teams, in consideration of diversity, equity, and inclusion, are critical to achieving these goals. In fact, solution to many, if not most, of our most pressing challenges are unlikely to be solved by a homogenous or unidisciplinary team.

Increasingly, the view that scientific work can't be excellent without consideration of diversity, equity and inclusion is growing. That's the perspective that we take at the

national Academies for science and technology to be more relevant, it needs to include a broader range of people of social and social science, related issues that need to be addressed. Diversity, equity, and inclusion should be considered as a matter of course in the work.

Innovation also benefits significantly from both multidisciplinary approaches that consider ethics and social factors. For example. factors related to fair distribution of benefits and risks of new technologies. Too often it seems that new technologies when they're launched the negative impacts disproportionately land on those who are already in disadvantaged positions, who face barriers and challenges in our society.So the inclusion and understanding of diverse perspectives, excellence, inclusion - all of those factors should be included at the outset. My division, the division of DBASSE has actually been taking a really close look at multidisciplinary teams and teamwork in science for quite a while.

In fact, one of the photos here is a photo of a cover of our 2015 report on team science, we're actually in the process of updating that topic and doing a new study on team science that was actually launched just a short time ago.

Again, all of the factors that are noted on this slide excellence, relevance and innovation have implications also for economic outcomes. Others are associated with the new technology. Again, as I mentioned, in relation to trust in the new technology. also in terms of new channels of services, new features, new markets.

All of these topics are likely of interest to the Isip membership. Finally, if the aim of a new technology is to benefit society tech for good. and the aim is to improve human thriving, which I believe is the ultimate goal in much of our work.

This will be positively impacted by consideration of equity and inclusion and social factors as we do this innovative work.

I'd like to point to another recent example of why multidisciplinary teams matter? Most of us are likely aware of the Herculean multidisciplinary effort that went into developing vaccines during the COVID-19 pandemic; many of the day-to-day activities to prevent disease transmission, however, were social and behavioral in nature. So hand washing, mask, wearing, distancing, all of these factors have social and behavioral and education components that played a key role along with the infectious disease expertise that was brought to bear on the pandemic.

Another recent National academies report toward equitable innovation in health and medicine. A framework points to an example of the pulse oximeter. which systematically overestimated arterial oxygen. Saturation among Asian black and Hispanic patients as compared to white patients during the pandemic which resulted in delayed symptom, identification, and delayed treatment for these patients. Further, as we continue to grapple with the aftermath of the pandemic, many of the issues that we're dealing with, such as clinician burnout educational impacts mental health issues are related to social and behavioral factors and so incorporating social and behavioral expertise in our multiple multidisciplinary teams as we're thinking about new innovations and technologies can also help us think about the longer term societal impacts of the work that we're doing

So why does diversity and equity in stem matter at the national academies? Diversity, equity, and inclusion is embedded in the enduring tenets that guide our strategic goals.

These tenants include expanding with whom and how we engage and partner designing for diversity, equity and inclusion in all that we do. and embracing continuous innovation and learning. People often think first about the benefits of inclusion to the diverse individual. for example, equitable access to opportunities, the opportunity to contribute and, of course, fairness.

I hope that I've been able to clarify in some of the previous examples how diversity, equity and inclusion can actually benefit teams and innovation. And I'll share a bit more about this as we move forward.

But this benefit also extends to institutions and then ultimately to systems. If the list that's on this slide looks familiar, it's because it's the same list. Excellence, relevance, innovation, economics and human thriving associated with multidisciplinary teams that include the social and behavioral sciences.

So it stands to reason that leveraging diverse teams will also advance innovation and equity along the same lines in many ways as multidisciplinary teams. So the entire time that I've been speaking with you about multidisciplinary teams, I've really been focusing more specifically on the inclusion of social and behavioral science.

Why are the social and behavioral sciences specifically so important to engineering and technology? Well, you don't have to take my word for it. You can take Dr. John Anderson, who's the President of the National Academy of Engineering's word for it.
He shared his thoughts on why social and behavioral science was important and his contribution to the Y Social Science blog post that I cited here. Included a couple of quotes from Dr. Anderson here. But it boils down to the title of his blog post, which is why social science, because engineering is intended to benefit society tech for good. In other words. So, after all, that's what we're talking about. tech for good tech for the benefit of society.

So how more specifically can inclusion of the social and behavioral sciences on multidisciplinary teams be a benefit. So often, I hear some colleagues in engineering and technology, for example, refer to people as users. But people are this. people are diverse. People are complex. I've heard it said that people are messy. but I believe the individuals I've heard say that say it because navigating and understanding. The complexity of people and society are outside of that person's scope of knowledge and expertise.

But it's not outside the scope of the social and behavioural sciences. In fact, we've got this, the social and behavioral sciences take this complexity and we develop theories and approaches like this..

So this is the Bronfman Brenner ecological systems theory model. And in this model people are embedded in nested systems that interact with each other over time.
This model was actually first published in 1979. So we're looking at more than 4 decades of the use of this model in understanding people.

So the individual that user is actually embedded in systems, like families, schools, churches, for example. And then those systems are embedded in other social systems and those systems are embedded in the larger national context.Those systems all interact with each other. And then you can also add the dimension of time. So this is the kind of thing that people in the social and behavioral sciences do.This is how we make sense of all of that complexity that was illustrated

on the previous slide and this is the kind of expertise and knowledge that we can bring to multidisciplinary teams as you're thinking about how to do your tech in a way that will benefit society tech for good. Also note that in thinking about this model, for example diversity is inherent in this theory. The social behavioral sciences center people. and our work has space for diversity and for diversity frame built into it.

The social and behavioral sciences can elevate the evidence base around diversity, equity, and inclusion, because the social and behavioral sciences are central to the creation of that evidence base on diversity, equity, and inclusion.So bringing the social and behavioral sciences into your work. brings diversity, equity, and inclusion into your work as well and brings frameworks that that can bring that diversity, equity, and inclusion and the evidence base around it into your work.

In fact, some leading edge. Social and behavioural scientists are already thinking about how we might leverage some of these new technologies like AI to improve our models. So instead of this, what looks like a flat sort of one dimensional model which is actually not actually becomes more of something that can be interactive. For example, as we think about how? How these multiple systems that are nested interact with each other, and how they change with the dimensions of time.

So how should multidisciplinary teams with social and behavioral sciences work well. I like to use a cooking metaphor. And our cooking or and or dining metaphor. We don't want a seat at the table as social and behavioral sciences. By the time that dish arrives at the table it's already baked. **We want to be in the kitchen when the recipe is being created**. Not only will this have an impact on the questions that are being asked and the problems that are intended to be solved by the technology but it can actually lead to a richer outcome.

You know, for example, instead of this hard, crusty cupcake. It can lead to this rich dessert, one of these rich desserts that you see here. or it may actually lead to an entirely different outcome. Maybe what's needed to address this challenge isn't a cake but actually a pie. So bringing the social and behavioral sciences into the kitchen when you're developing the recipe can not only lead to richer. deeper outcomes in terms of the richness related to societal benefits, diversity, equity, inclusion, but you may actually come up with a different technology or a different answer to the question entirely.

This slide includes a couple of examples of the work that DBASSE is doing that leverages multidisciplinary teams, and that will use an equity lens in our work.

One example is the climate, resilient communities pathway of the National Academies institution-wide Climate Crossroads Initiative.This is a cross-cutting initiative that will leverage all of the divisions across the National academies to address issues related to climate. And not only will this be the climate resilient communities pathway will be based in the division of behavioral and social sciences and education.

But it won't only bring the social and behavioral sciences and education perspective to the work. But we will also partner across the academies, for example, with colleagues and the division of engineering and physical sciences, with the health and medicine division to bring all of these perspectives to that climate, resilient communities pathway.

So that's one example of work that we're doing at the National Academies that will leverage diverse teams even within the institution, to advance innovation and equity around a really

critical topic, which is climate. Another example is one that I briefly mentioned in our science, engineering and technology equity Round Table, which we're working to stand up right now. Which will aim to identify ways to fake equity into science, engineering and technology systems and structures. And it will be a multidisciplinary multi-sectoral activity that DBASSE will lead in partnership with the National Academies of engineering, the division of engineering and physical sciences, and our diversity of inclusion, office of diversity and inclusion at the National Academy.

These 2 activities both will aim to address the kinds of challenges that again can never be addressed by a single discipline, or even by single sectors. And both of them, as it happens, actually map onto sustainable development goals

Now, I've shared a little bit about multidisciplinary teams. What some of the benefits are, likewise with diversity, equity, inclusion, and diverse teams and leveraging diverse teams. What I didn't say was that any of that work would be easy.

We know that there are challenges to multidisciplinary teamwork and to incorporating diversity, equity and inclusion in teams.Fortunately, we, as the National Academies, have undertaken, undertaken a series of of reports and studies to not only identify the challenges, but also to share some evidence-based recommendations for how to address them. This is really extensive work. Each one of the reports that are illustrated here, for example, are several 100 pages long. and that they summarize the evidence based on each particular topic, and and and share some extensive recommendations for addressing some of the challenges that are discussed.

So I'll just touch on a couple of examples here. But again, I refer you to our reports, for much more in-depth looks at these complex issues. So for example, challenges to team science can actually occur. When a problem requires deep integration of knowledge among team participants.

So clearly individual team members who come from distinct disciplinary perspectives may have more difficulty than if everyone is coming from the same disciplinary perspective in terms of integration of knowledge. One of the reasons I shared definitions at the beginning of this talk is to ensure that when we're thinking about diversity, when we're thinking about multidisciplinary, that we're sharing the same definitions. Even something as basic as definitions of topics can be a challenge unless everyone takes the time to get on the same page.

So when technical knowledge, for example, is valued above the social behavioral science, knowledge of knowledge, those distinct disciplinary perspectives can be a challenge to deep integration of knowledge among team participants.

Another challenge is when the goal of a multidisciplinary team is at odds with that of other teams.So, for example, multidisciplinary work may actually take longer and be at odds with the team that's responsible for setting the timelines of the work of the multidisciplinary team. So if that's not taken into consideration. There can be the desire, for example, to take shortcuts and skip over some of those really critical diversity and inclusion, or multidisciplinary perspectives for the sake of saving time.

But some of the recommendations that we share. And these reports address these challenges. So, for example, in in terms of the challenges that I've elevated here, some of the recommendations may include making it clear at the outset that team members have equal status and ensuring that any sort of asymmetric power differentials are addressed and removed at the outset and that the technical team members are not, for example, in power positions over

the social and behavioral science. Experts that are members of the team, but rather there is equal power shared amongst all members of the team, and then also stepping back and thinking about the incorporation of diversity in developing team roles can proactively address some of these challenges.

Seeing the importance of diversity and inclusion to the team can ensure that all team members have clear roles and expectations that are in alignment with each other about those roles and the importance of the contributions of each team member. So again, if you're interested in some of the details about how to do multidisciplinary teamwork, how to address issues associated with diversity, equity, and inclusion in your organization. I highly recommend these 2 National Academies reports that go into great depth about addressing these topics.

And I mentioned before that social and behavioral scientists. When we look at these issues, we often take this really strong systems approach.And, in fact, that includes sometimes the history. And this report on anti racism, diversity, equity, and inclusion in stem organizations actually does that situating this work in some historical perspectives so that everyone again is starting thinking about these issues starting on the same page with respect to the history of some of this work, and why it's important for for our work to understand that history going forward

So then, what's next for DBASSE? I've I've talked a little bit about some of the reasons why the work that we're doing in the social and behavioral sciences and education are important, not only at the National Academies. But how the work that we're doing can inform some of the work that you're doing around. The contributions of multi-disciplinary teams of diversity, equity, and inclusion in the stem sector show how you might be able to leverage some of the work that we've done to inform your work.

But we're gonna continue our work. We're gonna continue landscaping, looking out at the field and seeing what's next and what's needed.

And in doing some of that, we've identified some topics that we're moving forward with already, and some additional topics that we plan to move forward with in the near future.

So I Mentioned already that we are in the process of updating the team. Science report that work just launched. The previous report was published in 2015. So that's been about 8 years. So we're going to be updating that work and incorporating an additional 8 years of knowledge about what we know in terms of the evidence base around team science and how to do it. Well. we're also hoping to recognize that team science doesn't always address all of the issues of multidisciplinary.

So we're planning to do a team, a multidisciplinary team's workshop in 2024. I mentioned the climate, resilient communities pathway of climate crossroads. We're in the scoping phase right now. Understanding exactly what will be incorporated into that pathway as part of our cross institution, cutting climate crossroads initiative.
I mentioned the science, engineering and technology equity Round Table. As we're increasingly thinking about equity, it's clear that equity, like the social behavioral sciences, really need to be baked into the work that we do at the outset. Not the sprinkles that are added after the product is baked. Not served up kind of at the table after the work has moved forward. But really it really needs to be integral to the work. It needs to be baked into our science, engineering and technology systems and structures to ensure that equity. Is included at all fast in all facets and at all steps of our work.

And our goal is to launch this work in 2024. We're also doing work and on data equity. Looking at data equity, the division of behavioral and social sciences and education includes a strong focus on. And we actually have a committee on national statistics. And so we're gonna be looking at data equity as a component of our work. Community engagement is also something that my division does really leading edge work in at the National Academies. And we're going to be increasingly looking at how we can engage communities in our work. And as part of that work as well. We're also thinking about the science of storytelling. How can we leverage that science to ensure that we're we're telling stories about how tech can be used for good and to address issues such as trust and science, by telling our stories in ways that resonate and that elevate our science to a broad range of stakeholders and to the public

So this is just a list of some of the references that I mentioned during the talk. I would encourage all of you who might be interested in more in depth information that I could share in a 30 min keynote to please. Go to our website. All of these references are available free of charge on our website, and you can take your time and read as much of it as you'd like

And I would also just like to thank all of our team and staff at DBASSE. We have a really outstanding team and if you would like to learn more about how you can be involved in our work, I encourage you to please reach out to me. Here's my email address. That's the best way to reach me. And I hope that I hear from some of you, and I hope that you found the topics that I raised today helpful. Again, I realize that I can't possibly address everything there is to be addressed on this particular topic in 30 min. So I'm hoping that this is just really the beginning of a conversation, and that you found this helpful in thinking about how you might engage your own multidisciplinary teams, and how you might leverage diversity, equity, and inclusion in your innovative work. Thank you.

Deb Stokes, ISSIP VP/Dell Technologies: Wow! There's so much rich information that you just gave us in a very short period of time. I don't currently see any questions in our window. We do have a few minutes that we could do some questions, but I have one that I'd like to ask and I do love cooking. But you know sometimes, Carlotta, assembling all the ingredients, making sure you've got that special secret ingredient that you need to create this beautiful masterpiece. Isn't this similar to how do you assemble and create those multidisciplinary teams to make sure you include those behavioral sciences from the get go rather than Oh, wait! We've got this plan, we need to have some diversity and inclusion and equity baked in. And oh, it's already, you know, 350 degrees, and it's halfway done? What, how? How does that just slow us down? Don't we need to just move forward? How do you pull it in up at the beginning, as part of the critical recipe.

Well, that's a really great question, Deb. Thank you for that question. That's a question that often pops up when I'm thinking about doing multidisciplinary work. And when people think about trying to do work that addresses equity from the outset, and it's true that it can take longer, especially when you're first starting out but in my last role in industry, I actually worked in quality control. And so like quality control, it has to be something that the organization values right? So ensuring from the outset that like quality, it's something that's important to the institution. I know I was responsible for slowing down production on many occasions. But it was something that the institution valued,enough that it took time to address that because it was something that the organization saw as being really critical for the work that it was producing for the product that was being produced. So ensuring that the time to do that kind of multidisciplinary work and the time to address equity is built in and has to be an institutional, organizational, essentially a value.

That's held up along with other things that the institution or organization values from the outset. So like we do at the National Academies, elevating it as one of the core principles of our work in terms of diversity and inclusion, ensures that we will take the time to make sure that it's baked in, or that that ingredient is part of what's mixed in from the beginning, and that it doesn't end up being the sprinkles on the dish after it's all baked up.

Deb Stokes, ISSIP VP/Dell Technologies: Hard to believe, but there are some forces in our society that are speaking in opposition to DEI. Do you have any experience and advice to the rest of us about how we can engage the people who are somewhat, and I can't imagine why, but they're skeptical about this topic. What do you think?

Carlotta Arthur (National Academies/DBASSE): Well, I think that there are a couple of things that can be done, one being at the National Academies, we elevate the science we share the evidence base on why diversity, equity, and inclusion is important. Not only in terms of just, you know again, fairness, but how it benefits our work. And increasingly, again, the perspective is based on the science that we can't do the best science without considering diversity, equity, and inclusion that it's a necessary component of our work.

If you think of it from the perspective of being innovative and competitive. Having those diverse voices that bring different perspectives, different ways, different approaches to the work, will enrich the work. and in terms of trying to convince those who are who are really skeptical. I actually find that perhaps the better approach is to identify those who have an open mind and who are willing to listen to the evidence and take that into consideration versus those who might have their heels dug in about a certain perspective that excludes diversity and inclusion, and get the majority thinking along the same lines.

In terms of the importance of diversity, equity, and inclusion, you might find that some of those who have been really hardline skeptics, once they see their colleagues and others that they respect understanding the importance of diversity, equity, and inclusion, and are multidisciplinary in the work, seeing the benefits. Seeing how it actually improves the work to have those perspectives represented. How you can reach a broader swath of the population, how you can significantly improve the positive impact by incorporating those perspectives. The hope is that they'll come around but you may actually get more traction, not starting with the hardliners who have their heels dug in around the particular perspective, but by identifying those who who have an open mind and just need some of that science are are some who can leverage their own perspectives and their own stake.

To think more broadly about how these particular perspectives could actually improve the work that they're doing and have a positive impact.

Deb Stokes, ISSIP VP/Dell Technologies: Great answer. Thank you very much.
Another question from Chat. What are some of the metrics that you use to know that these are successful, what are the measurable outcomes that it would help us to be thinking about as we look across this whole realm of what we're talking about? In other words, I love the way you said this. How do you know if it worked or not?

Carlotta Arthur (National Academies/DBASSE): Those are great questions, and this is one of those short, medium and long term impact type of questions. How do you know it worked? Much of what we address in my division. This division of social science and education actually has the longer term impacts that are harder to measure in the shorter term.

But you can see, for example, around some of the specific reports that are released. For example, my division actually released a report on child poverty a few years ago, and many of the recommendations were taken up by Congress and as a result of taking up those recommendations and implementing some of those recommendations in the policy that was developed. There were significant declines in child poverty.So those are some of the impacts that we can actually point to in the shorter term.

But many of the kinds of impacts that you'll see from the kind of work that we're doing are the longer term harder to measure impacts. It's sort of the nature of the social and behavioural sciences. If you think about those systems, though. So think about that model that I shared where they're the nested systems. It can take time for the benefits to ripple out through each one of those systems. But ultimately, the benefits can hopefully be measured in terms of quality of life,, in terms of positive impact on society. In ways that the families and communities, for example, measure those things which may be different than some of the ways that us as scientists or people in the technology space might measure them.

Deb Stokes, ISSIP VP/Dell Technologies: Right, yeah, there's always so many intangible benefits. That is very, very hard to measure. And I have one last question. Before we move into our panel conversation: is there any active research going on in this area in addition to what you're doing for your round tables? Do you have any of the government research labs looking at this, is there any academic research looking at this, any research labs looking at this? Anything that you can share with us on what's happening from a research perspective.

Carlotta Arthur (National Academies/DBASSE): So one thing I should share is that we actually do very little research at the National Academies. What we do for the most part, is pull together the research that's already been done and incorporate them into these reports that, for example, the ones that I mentioned.So there is research that's being done. It's being done across the nation in many academic institutions. It's being done by some of the scientific organizations, The National Science Foundation, the National Institutes of Health.

They all have articulated their interest in these topics. And so you can actually identify, you can reach out to these organizations. Look, for example, look up on their website. what their commitment is. And some of the work that's being done in these spaces.

And so yes, it's being done increasingly in multiple sectors again, because increasingly, multiple sectors are understanding and recognizing how important this work is, not only to individuals but also to pretty much every facet of our society. And it's something that's really going to be increasingly important as we move forward as a nation,to address the needs of all the members of our society. And so thinking about tech for good. It's good for who or for whom and that's you know, the population of the nation is very diverse, and thinking about that one slide where I shared the definition of diversity.

So I think it's probably more the case that you can't ignore this going forward, and I think that many people in the scientific endeavor are thinking about how to increasingly incorporate these

perspectives, both multidisciplinary and diversity equity, and inclusion in their work in meaningful ways.

Deb Stokes, ISSIP VP/Dell Technologies: What an absolutely awesome, closing statement that you just did in answer to that question! Round of applause. Thank you so much, that was fantastic. Really appreciate your insights and sharing. And now we're gonna flip just a little bit and let's talk about the implementation of tech for good. I think you'll see from our panelists that are coming up we have what I would call really best practices around tech for good. So with that I'm going to ask each one of our panelists before they speak to do a quick introduction, and and and they have a few slides that they want to share with us to accompany their remarks, and with that

I will ask Vanita from Vanita Wells, from Meta to go ahead, share your screen. And let's hear from you. Very excited.

Vanita Wells (Meta): Thank you. Thank you, Deb, and and thank you, Carlotta, for your presentation. And you know, reminding us how important it is to bring an inclusive mindset into our every day work.

There's definitely published evidence that tells us that diverse teams create better products and that companies with diverse leadership deliver better business results. And I don't know about you all. But I wanna be on a winning team. And so that's the kind of team I wanna be on

My name is Vanita Wells. I lead Meta reality labs, operations. Or really my team, I think we run the business for reality labs at Meta. What that means is that my team manages the planning, procurement and placement of inventory to all of our distribution centers around the world as well as our customers. We manage customer orders all the way through to fulfill global logistics for all of our products as well as all of our R and D activities, and also all the post sales operations which includes customer support, customer experience, work as well as all of our reverse logistics and repair operations. I also lead a team that is driving the development of tools and systems that we need to run this part of Meta reality labs. Because the work that we're doing building VR and AR products has a very different business model than the standard Meta social media slash advertising business that supports the family of apps.

So with that, I will start sharing. Alright. So today, I'm gonna provide some real life, tangible examples of how VR technology is already being used for good.
But first, let's set the level set on what exactly, is virtual reality and why, it's such a powerful technology.

VR, in some form, has been around for a long time. Basically, VR is a computer generated simulation. It's an environment that users can interact with in a way that seems real.

There are basically 3 types of VR, it starts with non-immers of VR, such as console or gaming computer games. These have been around for quite a long time. The user is still fully in their real world, but they interact with a computer-generated environment.

Next, we have what we call semi-immersive. So this is a situation where the user is still aware of their surrounding world. But they're really heavily embedded in the environment. And the best example of this that I came up with is a flight simulator.

I know I've had the experience of actually using a flight simulator back in the old days. And so that was in effect, I think my first exposure to virtual reality.

But what we're going to talk about today is really what we call fully immersive virtual reality. This is the most realistic simulation experience. It's complete with sight and sound and sometimes touch or haptic feedback as well, and generally it requires a head mounted display in order to experience.

So before I came to reality, labs or Oculus, as it was known at the time. I really had no idea about this technology or how it could be used. It's fair to say that I was pretty skeptical of VR. As you know, I, who built a career in high tech hardware, would fit in at Facebook as the company was known then, which is a social media advertising company.

All of that changed when I experienced VR firsthand. It was a demo experience called toy story. Excuse me, toy box where I was in VR with another person, and we interacted with virtual toys that just, you know, rolling a dump truck or tossing balls back and forth and at the end of the demo I was playing ping pong in VR with the other person.

Now they were actually in the other room right next door to me, but I realized that that person could have been anywhere in the world, and we were engaged in this game. And I realized I was getting really competitive.I felt immersed in that world, and it felt just like I was experiencing the competition in real life. That's what we call a sense of presence, which I think is one of VR's magic powers

I was interacting with and manipulating the virtual items of the objects in the virtual world. That's agency And that competitive feeling was an emotive response which I think is another superpower of VR, although there are many examples, I'm going to focus on the use of VR in health. training and education and in bringing humankind closer together.

First of all, let's talk about health and fitness. So this clip shows people playing supernatural, which is one of the most popular applications for both fun and fitness. We have a lot of testimonials from people who are using VR as a gym, especially for cardio workouts.
The cardiovascular effects of exercising in VR are really just the same as any other exercise and if it's fun and engaging, such as including a personal trainer or introducing competition, people are more likely to stick with it. And then you think we'll realize more positive effects.

Very different kind of application for VR is to use it for pain management. This example is about helping remove the perception of pain from people receiving some very painful treatments that are required for burn victims. So there are several techniques for distracting the mind, because, remember, pain is in the mind, regardless of where it originates. You know it's in the mind is where we actually perceive it. And there are several techniques for distracting the mind during painful experiences to reduce that perception. You know, thankfully, I haven't experienced it, but I've read that regular skin cleaning and abrasive abrasion required for burn treatment can be extremely painful, and when patients experience the pain, they're more anxious the next time that the treatment is required which causes the mind to think even more about the anticipated pain. This study from the University of Washington showed that exposing children to VR. During these treatments significantly reduces the patient's perception of pain and lowered the anxiety level and after reviewing 10 studies about using VR as a pain management tool, the National Institute of health, concluded that this can be an effective, effective, and significantly reducing

the perception of pain of burn victims, and presumably that would be effective for other painful treatments as well.

The next area is really with respect to well-being or mental health. and VR is also being used in this area. There are VR. Apps for meditation, for example, that can be effective in lowering levels of stress and anxiety which really helps to manage the mental health and high blood pressure for a lot of people in controlled settings. VR. Can be used to treat mental health conditions, such as phobias by exposing patients to their fears in what's really a safe environment because of the strong sense of presence and emotive response evoked by VR, you really do feel like you're there.

I remember being in VR. On a very tall structure, and I could feel my own fear of heights coming through.So again leveraging some of the superpowers of VR can be used in so many ways for general health and fitness.

So there's also been a lot of headlines lately regarding the use of VR. In training and education. These are all headlines. It took 5 min. I just clipped them and put them here, and you can see that it's a pretty hot topic right now in this world. and also several companies have been established to actually develop VR training and curriculum.

So why does it work?

There's several reasons why VR is an effective medium for learning, and most of these are related to the superpowers that I noted earlier without external distractions. Students are more focused on the material adding a physical component to the training which is an agency that aids in memory and recall. And, unlike many real world locations. VR. Simulations are physically safe which allows for practice of a dangerous task in a dame in a, in a safe environment one of the first to demonstrate the efficacy of training in VR was Johnson and Johnson Institute. Here, you see surgeons being trained on arthroscopic knee surgery, and the results were astounding. Surgeons who received VR. Training demonstrated proficiency in far less time than those who only received traditional training.

This next example from Duke Energy Duke uses VR. To train natural gas power plant technicians on inspection and maintenance procedures. Imagine a technician learning to say, not necessarily for Duke, but you know, with your police department learning to diffuse a bomb in a safe environment, or a police officer. Learning how to defuse a hostage situation that leads into really one of the next areas, which is the development of soft skills.

This example is from Pwc, they have been using VR simulations as part of their Dei curriculum for leaders walking a mile in the shoes of an individual allows you to see someone else's world. You can see what they're seeing. You can hear what they're thinking. And that really helps to equip leaders to value diverse perspectives and become more inclusive leaders.

And then, finally, in this section, there's the use of VR. In university and high school settings. Morehouse College, for example, found that using VR. To teach students a variety of subjects was more effective than classroom teaching and they found that they were more in, give it gauge, and they at the end of the course, had a higher score than their peers who did not use VR.

I often imagine a high school biology class, you know, where students can travel through the body to learn about anatomy, and how various organs work. Imagine dissecting an animal heart in VR. And imagine how making this available to students can improve learning outcomes the final kind of VR. For a good application that I'm going to talk about today leverages. V. R's ability to make you feel you are somewhere where, when you aren't actually there.

The first one is around. This is a walkthrough of a refugee camp. Now, this is actually a depiction when you're actually in, and you can. You know you can navigate this like you've all seen for movies and whatever that are filmed in 3D. But when you're in the headset and you're looking around. And you see the people. And you see the conditions, it really has a much more emotive response.

Specifically it allows you to understand the social, the actual suffering, the human suffering. You know what people are experiencing. And there are a lot of examples of these 360 videos that you can view in VR. That this particular one is a Syrian refugee camp. But you can find many of these documentaries that are depicting the life of refugees in South Sudan, in Greece, in Thailand, and many other places where large populations have been displaced.

And then, finally, for me. This is actually one of my favorites.This film is called Traveling While Black it is set in the Jim Crow Era. It's a re-enactment of what it was like for black people to travel throughout the United States during this era and, as you can see in the quote below.

This experiential film is really about empathy. It harnesses VR's superpowers of presence and empathy to help the viewer appreciate everything the black travelers had to navigate for a simple trip. Say, to visit your relatives for a holiday

Vanita Wells (Meta): which restaurants would serve you. what neighborhoods to avoid. where to find safe and welcoming lodgings? Many of us have had a hard time appreciating others. Experiences and films like traveling while black, provide a path to open doors of understanding.

Thank you for having me and I hope to see you someday in VR.

Deb Stokes, ISSIP VP/Dell Technologies: Well, we're almost there now. We're at least a virtual part of it, but not necessarily the reality part of it. But thank you, Vanita, That was wonderful. I'd like to turn it over to Doctor David Lee. Please go ahead, share your screen and tell us a little bit about yourself, and then just jump right into what you have to tell us today, David.

David Lee (UC Santa Cruz): Wonderful! Let me just share my screen setup/my slides
Well that both of the talks so far have been amazing and so excited to be here to be part of this conversation. My name is David.

I did my Phd. At Stanford, where I worked with governments on engaging community members in participatory democracy initiatives. And that's kind of where I started this journey on tech for good. And now I'm a faculty at Uc. Santa Cruz, where I run the tech for good lab.

What I wanted to bring to this conversation today is how education can integrate with work and community engagement, with industry and civil society to strengthen the development of technology for good.

I want to start with a quote from my advisor. From my time at Stanford, he said, algorithms used to be what made computers run faster now they create social and economic systems.
And it's true, if you think about it.

New computing has transformed our social interactions, how we buy things, political discourse and activism, how we find housing, transportation work, our financial system. We could go on and on.

We're in a world where our technological and social or societal systems are inseparable. The Internet creates a global network for technology facilitated interaction.Our devices allow us to tap into this network and for that network to tap into us and the cloud. And Api economy means that innovations are rapidly and continuously being introduced into these interactions that affect every part of our society.

So if you want to guide development of technology for good. We need to educate public minded innovators that can design to both technological and societal system level concerns in its innovations. But we're not just in a sociotechnical world. We're also in a Whitewater world.
John Seely Brown describes 3 different eras that require different ways of living, working and learning. He said, when he was growing up, his father told him, well, think of yourself. Your career, like a steamship. Set a course for your life and power through any obstacles that get in your way. But he found that his career was more like a sailboat adjusting to the natural forces of change to get to where you want to be.

Well, now, we're entering an age where living, working, and learning. It's more like Whitewater kayaking. You're constantly being buffeted by new rapids.

And we, as individuals and as communities. have to continually adjust and learn and adapt to navigate our way through. So we not only need public minded innovators that can design to social and technological concerns, we also need new models of continuous learning and collaboration that enable individuals and communities to adapt to change.

This is one of the things we think about in tech for good.

How do we build student programs? How do you build digital platforms that support students in growing into their full career identity and capacity amidst change.

Leaders that can contribute to communities and organizations learning to navigate a Whitewater socio technical world. In my research lab, we have over a hundred undergraduate students involved each quarter, and most of them join without any prior background. So let's say, they're interested in web development. They don't have prior experience, but they want to learn that. So we add them to an introductory web development team. And these students are learning user research design web development machine learning in the context of making real contributions to advancing social computing, research on education work and community engagement.

I want to share some of the projects they've worked on that will help. Both, illustrate the great work they're doing while they're learning. and that also themselves capture some of the ideas. And we have, or potential new models for learning.

One of the earliest projects we worked on was a platform called Causeway. It's a platform designed for learning web development.

And the big idea, and the platform was to organize learning around what we call micro roles. instead of going through a sequence of topical MoD modules like HTML, then Css. Then javascript.

Each module in our platform instead corresponds to these micro roles that are the building blocks of both the learning pathways and as well as building blocks for organizational structures that coordinate project contributions.

So someone new might be an elements developer or a layout developer, you know, working on a single component, that's part of a larger page managed by a more experienced page manager.

We found that people with little to no past experience in HTML. And Css. Really enjoyed it.

This is just a proof of concept, but they were able to complete static views of a web application as they were learning, and they said the ability to learn the concepts in such a way that they are applied quickly, then practiced on pages for real world use is rewarding and makes the material stick better.

This is how we started to think about organizational structures that center learning and that connects learning with real world contributions. It's one of the ideas that make our lab possible with 100, you know, plus undergraduate students. And we've also used it in a course based community consultancy program that we've been developing in my business strategy and information systems course.

I organized the entire class of a hundred plus students around a single large strategic assessment and design exploration project for nonprofits.

Students survey and interview dozens of the organization's staff leaders, volunteers and clients to understand internal perspectives on the organization's strategic position, its core values, its strengths, weaknesses, opportunities and opportunities and threats, as well as external perspectives on client journeys from discovering the organization, experiencing its services and re-engaging, finally, students, brainstorm ideas for using digital tools to support the organization and then split up into smaller teams to implement or prototype various ideas.

Some use existing tools to provide immediate value, and others prototype concepts for new apps. So there's this diverse portfolio of projects that allow us to support student learning and creativity while also ensuring that students are delivering at least some projects that have immediate value for our nonprofit partners.

To make this all work, we organize the course after the workplace as an organization. So you take just the first phase and the landscape analysis, we structure that by dividing up the course into 8 divisions, each delivering its own independent report with 3 teams focused on understanding either the organization's values, its strengths and weaknesses or its opportunities and threats.
In the first week everyone jumps in by learning thematic analysis. in which they analyze a few existing interviews that I've already conducted. And then in the second week. people are actually assigned to different roles, different homework assignments.

Some people practice that analysis again on new interviews, but people who did well in the first assignment can help conduct new interviews, or they can be. One of the team leads is working on synthesizing a divisional report with the leads from the other 2 teams in their division and then finally the leads in the top divisions they finalize and present the final report.
This process of learning thematic analysis is further supported by one of the platforms, Anota that students have built in tech for good. It's a platform where students can read and annotate transcripts towards defining themes that answer the given research questions and the big idea of the platform is, well, how do we turn large classes into an advantage rather than a disadvantage in a big class? It's not possible for Staff to engage in in-depth discussions and feedback with each student.

But you do have many students that are all analyzing the same interviews.
So could we leverage that? And so what we do is after students submit their initial annotations. Anoda will run an algorithm that predicts which parts of the transcripts are relevant and use this to provide personalized hints to students for further reflection. What we found is that even though only 25% of students identify a particular relevant sentence on average, after just around 20 students, the algorithm has an accuracy of 75% that far exceeds the best students.

So this is just a small example of organizational structures augmented by AI linking learning with advancing real projects.

This thematic analysis process we've been talking about happens in just the first few weeks of one class. But you can imagine what if an entire degree program were structured in this way. where students were learning business strategy and information systems, human centered design, research web and mobile app programming, all contributing towards experiential community engagement projects as they learn.

And what if past cohorts return in leadership classes where they take on managerial roles across the entire process.

Heather Mcgowan says, in the past we learned in order to work now in a white water world. We need to be engaged in work in order to continuously learn. And in a sociotechnical world we need to engage students and workers in the complex social community societal context that technology will increasingly be integrated into.

I want to conclude by saying that the Isip community has a really unique opportunity and position to think about new models for collaborative programs across industry, academia, government and civil society that provide students with rich learning experiences and development communities with innovation and engaged constituents
and industry with talent, innovative research, and impact in their communities.

Thank you.

Deb Stokes, ISSIP VP/Dell Technologies: Thank you very much, David. There are a couple of questions in the chat, but I think we'll hold them until the end of everyone's presentation. So let's turn it over to Renee,from Nvidia. And again, a brief intro and just jump right into your presentation. Renee. Thank you.

Alright. Hi, everyone, great to be here today. I lead ecosystem business development for health care and live science.

The first thing first is to ‘level set’ on who Nvidia is? As a company. We pioneer accelerated computing and our ecosystems span about 4 million developers, 400,000 companies and over 3,000 applications. Many people thought that maybe we are. A chip company is only looking at a small circle at the bottom left, whereas we actually built many different types of hardware with software system software, accelerated libraries, application framework, across many different industries, including healthcare, climate change retail oil and gas manufacturing, self-driving, car robotics. AI city. And more my day to day. Job is working in the healthcare life, science, space, and Nvidia supercharges, healthcare life sciences from medical imaging to drug discovery, genomics to patient monitoring, and many of the researchers use our traditional simulation, and AI to solve the next grand challenges.
To have the most recent hype is a generative AI, large average models and the similar techniques are being used to transform the pharmaceutical industry, to discover disease targets, design novel molecules and protein based drugs with our solutions called the Bio Nemo to help find the next drug candidate and the speedup what usually would have taken 5 years for the early discovery phase down to a couple of days, or maybe even hours.

Recently, ee also broke the world record with researchers from Stanford for DNA. Sequencing, be able to turn back results within 5 h and 2 min to reach a genetic disorder diagnosis within the same day for critical care patients from the software-defined medical devices perspective. We are also pioneering a lot of accelerated computing with hollow scan and igx to help speed up any of the real-time streaming solutions at the edge right here, and some of the use cases that you can see here is, for example, using augmented reality overlay of a patient anatomy from a Ct. Scan rendering in real time and augmented reality. And we can help surgeons actually be able to see patients' vascular and tissue structure a lot clearer and be able to make real time decisions and train younger surgeons on how to perform surgeries better.

Besides, in the healthcare space, we're also doing a lot in the climate tech world. And in that space one of our key initiative is Earth 2, which is a digital twin of the earth, and we hoped the simulation of the world, we be able to help predict the complex multi-physics of earth, atmosphere, land, sea, and ice caps at significant high resolution
to be able to help us better predict the regional impact of human action. One of the demos that we recently saw is in the next couple of years. There will be a few degrees increase in temperature in India that will cause a 30% decrease in crop, and that has resulted in regional policy changes on the import and export of crop for their local citizens.

Of course, besides many of the different AI for good use cases at Nvidia that we are pioneering. We're also working with ecosystem partners that are in either small start up stages or larger companies as well. Inception is actually one of our start up programs for 15,000 startups worldwide across a hundred countries. And last year our growth was about 40, and in our inception program we are working with startups in AI deep learning AR VR. Gaming, networking, and graphics.

We help them with innovating their solutions, building and growing with them. A lot of the start ups leverage our Nvidia Deep Learning Institute to take classes and leverage many of the AI technical expertise to speed up their training and development of their A. I. Solutions.
and if they do decide to build and buy, they can have preferred pricing on both software and hardware. And when they're ready to go we have go-to-market solutions, marketing, and also 700 Vcs in our Vc alliance.

And now let's take a look at some specific examples from our inception program.

This company is called evozyne. They are using generative AI for novel protein design. They can design novel adapted and high performance proteins to solve longstanding challenges in therapeutics and drug discovery and sustainability in climate change, they were able to come up with a hundred 65 mutations for drug disease, for disease mutations within just a few days to help with many rare diseases.

Scribe is a company that helps solve physician burnout by automatically document a lot of the charts. So 40% of the clinical workdays to day is actually spent on documentation and 60%. The physician burnout actually came from administrative tasks. So Scribe is able to use Gpo cello, the AI solution to help close charts in less than 2 min and reduce documentation by 75%. And that is actually an additional 2 patients per day for those who may be familiar with the oncology space. A doctor tends to see about 25 to 30 patients a day and sometimes for a patient who got diagnosed with cancer from day one, maybe down to getting the actual treatment, it can actually take them 6 months to get treatment. So anything in between that process that we can help automate using technology and AI is definitely help contributing to better. Ca, patient care.

Another company called Artisite. They are based in Chicago, Us. And for them they help with operational efficiency in the hospitals. What you're seeing here on the screen is they're able to detect the beginning and the ending of a surgery to help optimize number of surgeries that they can schedule with AI powered camera solutions. And they can also automatically detect temperature and use body post estimation to figure out when the patient is trying to get out of bed to predict, prevent patient falls, and since they're launched they are able to actually deploy across 2,000 hospitals and help report back a 16 X return on investment for the hospital, and during the COVID-19 pandemic they were able to reduce the nurse's need to enter into very infectious rooms by 3 to 6 x. And also able to reduce patient falls by close to 80%.

Another company, viz. AI is solving a challenge in stroke, which is one of the leading costs of disability. Just a few minutes delay. You can be forever actually paralyzed. So vis AI were able to automatically analyze CT. Images and send the results through mobile phones, coordinating a lot of care through multiple different players. In this stroke care continuum, within just minutes, Heart flow is company that's helping with heart disease, which is a world's biggest killer in the space, and they are able to help leveraging some of the Ct scan and computational fluid dynamic to actually put together a very personalized model of patients arteries and help analyze impact of blockage, and they were able to help reduce the unnecessary invasive Angiogram by 83% and reduce the healthcare system cost by 26%.

Noel is a Korea based company. They put together a digital microscopy platform to help solve the shortage of pathologies around the world. 2 thirds of the world's pathologists actually only distribute it across 10 countries. So for them, they have this software-defined medical instruments called Melab, which you only need minimum blood drawn from your fingertips to be able to diagnose malaria and blood cell mythology.

One of my personal favorite is Oxford Nanopore. They are a company that produced these palm size, seek gene sequencers, and they essentially can help identify the DNA and Rna. Sequencing of anything biologic and using Gpu accelerated AI, they're able to help immediately diagnose the devastating plant diseases in Africa to help with
 plant yields and saving lives, and also on-site testing for viruses such as Zika disease to help prevent the spread of infectious disease.

We consider anything that is software-defined in an instruments, devices that in the future can be autonomous robots. So many of the robotics across industries, such as manufacturing to agriculture, to securities, to home-based healthcare, are listed on this slide. Here, as you can see, many of the AI and Tech for goods are being implemented across many different industries.

I am very proud to be work working for a company, Nvidia, that's considered as one of the best place to work, and one of the smartest company on earth, and I hope. Many of the students in the audience here can consider in Nvidia as one of your employers in the future, and do your life's work with Nvidia or with Nvidia's ecosystem. We currently have about 16,000 generative AI companies that built their solutions on Nvidia, and we're very proud to be solving world's most tough, some of the toughest challenges within the company and in our ecosystem.

And if you enjoyed hearing some of the use cases, you can see actually a lot of the solutions live with us at our Gtc. Conference in person next year, March 18, in San Jose Convention Center, and for those who may want to get started in AI and deep learning. We also will be hosting a lot of the boot camps and Deep Learning Institute classes on site, too. So I hope to see many of you guys there and continue AI and tech for goods journey with us. Thank you.

Deb Stokes, ISSIP VP/Dell Technologies: Thank you, Renee, and yes, indeed, it is great to be a part of a company that's doing so many advancements in this space right now.Moving on to our next panelist, Nicole, I just have to personally say is so delightful to share stage with you again. It's been way too long. So over to you for your remarks and presentation. Thank you.

Nicole Reineke (she/her) CTO, Shift5.ai: Thank you. And as always, I'm so excited to see everything everybody is doing here. It's amazing and exciting for those of you I haven't met yet. My name is Nicole Reineke.

I am the chief technology officer for shift. 5 AI. And we're building and training cutting edge AI solutions to solve a lot of critical tech domains. Prior to starting this company, I was a senior vice President of Innovation for Iron Mountain, and prior to that I was a senior distinguished engineer at Dell technologies. I'm also an inventor with about 100 pending and Grant patents. I'm the co-author with Hannah and Debra Slapak of the book called Compassion Driven Innovation.

And that's really what I want to talk to you about today, because it's all about, how do you blend agile design thinking and user experience and research into moving technology forward for the best for everybody involved. So I'm gonna share with you some of the real process, and then walk you through some examples that we've implemented over the past 6 months. We could move forward.

So Ux or user experience design has this incredible concept and way of thinking about helping people to create sustainable and right focus. Do you have to do more than just
care about somebody, right? Because that's what sympathy is. So you get a glimpse of understanding, and you care about someone suffering that sympathy.
And then the next thing that happens is when you start to go into design thinking or using other methods. They really encourage empathizing with the user. And empathy is when you feel for someone suffering, and you, you kind of want to stop it right? But that's not far enough, because what that does is it forgets everything that's happening around. The person who you're trying to help. What you really need is compassion and compassion is an understanding of the situation

and an understanding of all the surrounding components in a depth where you want to and can identify how to relieve the suffering that's happening for everyone involved in the situation.

If we could click forward - the way you do that is, through a really deep understanding of who is involved in the situation. The impact that's being had on the situation.

And this is where, as far as starts to diverge the existing journeys for everybody involved across an environment or across a situation. And then, most importantly, where your goals and capabilities as a human and as a company intersect with the needs of the people.

This is a really important concept. If we move forward. So what we did as as a set of co-authors and as co-workers, because at the time we were all adult technologies is we identified a way to build and repeat systematic compassion.
It sounds a little bit overwhelming. It sounds a little callous. It is not. This actually really works.
and the reason it works is because it's all hinged on storytelling.

One of the most effective ways to understand people and to understand what's going on in an environment is to display a deep empathy and compassion for people in impact. And you can't do that with glossy slides.

You really need to do it with immersive research and storytelling. if you move forward, please.

And so you can break that down. I know this is small, but it's gonna seem really obvious in just a second with just 5 storytelling techniques. And you do these in order in order to create true systematic implementation that's repeatable. And that actually ensures you're doing something good for everybody involved in what you're trying to build.

You want to make sure you have what's called a relationship map. So how do you know who you're trying to sell to or who you're trying to help? Who are the people who are influential in that environment list? All of those people. And then who are the possible people impacted? What are the ramifications of any kind of change that are happening? So this is a relationship map. And you can do this in just a few minutes. What do you understand about the situation? Who's involved?

I actually really have started to use generative AI deeply when I'm going through this process. So I will go and sit down and say, here's the situation I'm thinking about. Create a list of 50 people who are either the people who are affected, the people who could influence it, or the people who are impacted by it.

The next thing that you're going to do is you're going to create what's called a prototype journey map. What do you think happens in 10 to 20 steps between when the person starts to think about the issue at hand to when the issue at hand comes into play all the way through. What happens at the end of the day or the end of this cycle.

This is what you think happens. This is your journey map. The next thing you're going to do is this third thing over here is, you're going to create a list of all of your assumptions that it took for you to make that map. You're going to question everything.

So here's why you do it in this situation right here. This is a company called Innovation Africa. Innovation. Africa is an organization that has helped millions of people get access to clean water.

That is not where they started. Where they started was the the woman who founded it is this incredible woman, and she said I was in Africa, and I noticed children weren't receiving education. I want to help children go to school.

So what she saw initially was that the children weren't in school, and it was dark, and they didn't have access to electricity in these buildings. So she took what she thought was her knowledge, which is, she had a deep understanding of solar electricity and and electricity generation. And she started putting electricity in in buildings, in villages in Africa that actually didn't solve the problem. The children still weren't going to school, and it was only after she created the systematic way of looking at what was happening, saying, well, who's really involved. Who are the decision makers? What's the journey? What are the assumptions where she actually discovered that the point of friction that was happening is that the children did not have access to clean water.They were getting sick. They couldn't attend school because they were ill, or they had to help with the the identification and getting of water from this far off location to bring it back to their families to help their families survive.

So, as you can see by simply sitting down, saying, What is the actual journey? What are all my assumptions? And intercepting that early you can start to make different decisions. So by providing clean water, she actually was able to positively impact the ability to educate the children within villages.But it wasn't until the systematic approach. So the top 3 are. Who are you trying to help? Who's involved? What do you think the journey is?

Challenge every single assumption. When you challenge every assumption you can now draw out a linear version of the journey, and you can identify the points of friction that are happening along every point of the way.

And when you've identified these points of friction, you can then intercept them and say, What do I do to intercept the points of friction at the earliest possible moment, in a way that benefits all of the people I've identified in the relationship in in a way that uses my skill set and my desire to do good for the world and in a way that's positive for my company. So you start drawing out these things on the bottom, which are linear journey maps that identify points of interception.

Once you've identified and and created a solution that actually resolves enough of the issue to create benefit for all of the people involved. You then do what Pixar does, which is a storyboard. Now tell the story in a way that is meaningful and impactful

So that's a story about innovation, Africa. And so in the last 6 months have actually used this process incredibly, effectively across both Multi 1 billion Dollar company. And you just start up day 1, 2 people.

The first was around digital pathology. So in the situation we were at, we were trying, the large organization was trying to work with people who were building models to automatically detect cancer cells based on pathology scrapes. And as we started to sit down and say, wait a second. Why isn't this working? Why aren't we selling? Why aren't we getting anywhere? And we wrote out the relationship map and the real journey map? It turned out that the first point of friction that we were encountering is that in order to train models to detect cancerous cells, you have to

have access to hundreds, if not thousands, of existing digital images that are well documented to have a specific set of features which are known to be cancer. It's using this set of data to that, you can actually start to train models.

Well, the organization I was working with actually had billions of glass slides which they could say, well, we know what these glass slides are, because we have billions of glass slides, and we can identify the different information that's in the patient files.

So instead of working on the model, it turned out, they actually needed to take 10 steps back and actually work on converting all of the glass slides, associating it with patient metadata and creating these datasets that they could then sell into people who are experts at building models.

This is now a massive market and a massive market opportunity for the company, simply because they stepped back, looked at everyone involved, and identified that first point of friction that aligned with the needs of all the people involved and the capabilities of the company.

So they went from failing and flailing to massive market opportunity, and something that's really good for the world simply by taking a step back and using the systematic compassion, capability.

It's how, how this use of systematic compassion is an advancement on the historic empathy and journey maps that have been made up in the past. Yeah, yeah, it's a great question. There are pieces of it that have existed, you know, across a bunch of different disciplines. And what we've done is we took the discipline of everything that's in Ux. So a lot of people think of design thinking, that's really a user experience discipline, plus all of the discipline that comes from the product management approach to things. So how do you understand
the users? How do you understand what's going on in the market? How do you understand the capabilities of technologies? It takes all of the best practices from product management, the best practices from ux, and the best practices from architectural diagramming.

Which is that next step of how do you really clearly explain to technologists what needs to be implemented and what those end goals are, and it collapses all of that down into a very concise system of basically 5 different types of maps that can be repeated over and over again.
So it's it's taking the best of everything and really collapsing it down and making it repeatable and systematic, consistent.

Okay. So the second one that we recently worked on was about the Inflation reduction Act, which is really exciting. So the government put 8.8 billion dollars into the market and said for for the next 4 years you can use 8.8 billion dollars to reduce the electricity consumption of all residents and to electrify homes. And the reason this is really important is because if we do this as a country in the United States, we can meet 50% of all of our climate goals, changing absolutely nothing else, simply reducing the electric consumption and electrifying, which means moving people off of dirty fuels being consumed directly in their homes to using the electric grid, which will eventually be converted into more efficient fuels.

The challenge was, I was brought in to have the conversation, and they were saying, well, how can we market this and I started looking at it. And I started drawing out the relationship map and the journey map. And it became apparent that you can't market this to more people because it's unexplainable.

The actual system that was put out was a set of 200 pages of Pdf documents from the the DOE that is really indescribably hard to read, and is just a series of rules. It's not regularly consumable. So what we actually did is, we said, well, the reason you're not getting more people to adopt it into more people. To drop your program management software is because nobody understands what the heck is going on.

So can we use all of the technology that we understand today? Can we use Chatbots and generative AI to actually build a way to interface with this information that's generally consumable by the market and generally consumable by the people who are going to be doing this implementation.

So we took all of those Pdfs. Took everything we know about electrification, which is a great deal. There are many books on it, and put that all into a chatbot. So we trained or tuned the model for an existing large language model created a chat interface and then used that to actually start building ways to implement programs for regular people. So people who, you know, aren't reading 200 pages worth of technical manual documentation at a time. And that's what helped bridge the gap between. Hey, I've got 8.8 billion dollars that's being unused and is unusable and understandable to. Now, people are interfacing with this in a way that's really easy to understand, and we can help them build their programs up overnight.

So that's another one. And then the last one that we're working on is personalized data vault. Which is, how do we enable people like me to collect all of our data around health and finances and personal life, and actually start benefiting and selling my data to people who are doing things that are good, who are doing good model research, and allow me to monetize that or donate it if I choose to. So those are the projects that we're working on right now, and we're approaching it with that exact same systematic approach which makes it easy for us to be very successful very quickly.

Deb Stokes, ISSIP VP/Dell Technologies: Thank you so very much, Nicole. We don't have a lot of time for questions. But I do have one question that I think if each of you could maybe do about a minute and 30 s response on. When you think about the historic innovations and their primary benefits and harms. Okay, as an example, cars were great - the transportation. You got to go somewhere faster than you been walking or taking a horse? Right? But then it was okay. Then, now you've got accidents that happen on the highway that can cause harm to people. What innovations that, in your opinion, only have positive outcomes? And how will the benefits balance any potential harms of that innovation? And who would like to go first with that response.

Vanita Wells (Meta) I'm not sure that there are any technologies that are purely positive. I couldn't think of any. but I think that the important thing is that we think about what those possible harms are right. And we build into the way that we build the product or the way that we administer. Or in our case, you know, build the platform and and and govern the the platform. Minimizes those opportunities.

Nicole Reineke (she/her) CTO, Shift5.ai: Perfect. Thank you.. Yeah, I just want to add to that. So it's about being transparent as well and making sure that what you're doing, you've taken a a strategic look and a well a diverse look at what the potential implications are, and then communicated those implications widely and made purposeful trade-off decisions. That's really the most important part to me is understanding and making those trade-off decisions in a very conscious way.

David Lee (UC Santa Cruz): I'm just gonna echo what others have been saying. I think that you know benefits and harms come from people and how we use technology, how we understand each other, how we relate to each other. And I think about how to enable benefits to, you know, balance the harms. I think that. we do need to think of appropriate guidelines for technology. And we also need to think about how to educate people, to empathize with others, to think about the deep for impacts of technology and to want to, you know. Use it for for good.

Renee Yao (Nvidia): I echo everyone else's comments. And one thing to add is AI in particularly is very much garbage and garbage out. So, being very mindful in terms of how the data is collected and what sort of data is being used to train AI. And now, with generative AI and large language model, it's even more important to ensure putting the guard rails around. It is something that I think our future innovators should definitely think through. Thank you.

Deb Stokes, ISSIP VP/Dell Technologies: Really good, quick answers. Thank you very much. There's some great chat and commentary going on out on the chat window. We'll definitely include some of those and several really good links in there as well in our white paper that we'll be publishing shortly. At the after the conclusion of the session today. I do again want to thank all the panelists, Upal, Michelle, Jim.

Everyone who joined on the call and participated today and added comments, I will now turn it back over to Michelle to wrap us up, if you will please. Thank you all again, great job.

Michele Carroll (ISSIP):And thank you, Deb, for fantastic work pulling this all together. Fascinating conversation, great examples, panelists. You are all just inspiring and informative. Thank you and thank everybody who took the time to patch in today and join us, powering this discovery. Someone with your questions, your comments and your participation. We appreciate it.

All of our speakers will be receiving isip digital credentials for helping to advance service, innovation, innovation, sharing and thinking the slides will be available on Slideshare and the recording on Isup, Youtube, and there will be an email sent out to everyone who has registered and participated.

So that you will have easy access to those things, and we encourage you to stay engaged with us. October is a big month for Isaac. We vote for our Vice President Deb. Stokes will be shifting into the Presidency next year, and we need a vice President. So we have 3 very strong candidates. That announcement will be coming out shortly. And we vote over the course of October. All members are eligible to vote.

and you saw in the chat hopefully from Terri Griffith there was a call for nominations, for service, innovation, excellence awards for 2024 that those nominations are open now. Through the end of the year and then the judging happens. In January, February. We will announce in the spring. so follow us on Linkedin. I believe there will be a link there in the chat to follow us, and that's how to stay up with the many, many, many things that are going on and look for that white paper coming out in the fourth quarter.

So thank you all. We look forward to seeing you at the next interchange.

6
Appendix II: Event Chat

The event had 249 people registered, and about 70 attended online (dropping to about 50 by the end of the 2 hour online event).

Chat from invite:

00:32:00 Jim Spohrer (ISSIP): Welcome everyone - Jim Spohrer, ISSIP - here in California Bay Area
00:32:02 Dr. Mohamed Naser: Hi All and evening from UAE
00:32:10 Jim Spohrer (ISSIP): Reacted to "Hi All and evening f..." with 🎉
00:34:11 Jim Spohrer (ISSIP): Survey - add your position statement - https://tinyurl.com/ISSIPTechForGood
00:34:19 Yash Gandhi: Hello everyone!
Yash Gandhi from San Jose State University in San Jose, California
00:34:26 Jim Spohrer (ISSIP): Reacted to "Hello everyone! Yas..." with 🎉
00:34:47 Jim Spohrer (ISSIP): ISSIP
Home Page: https://www.issip.org
Membership Registration: https://www.issip.org/register
00:35:15 Bert Painter: Very glad to join you, from the Sociotechnical Systems Roundtable.
00:35:21 Alan Hartman: Good evening from Israel
00:35:26 Jim Spohrer (ISSIP): Please add your perspective - Survey - add your position statement - https://tinyurl.com/ISSIPTechForGood
00:35:30 Jim Spohrer (ISSIP): Reacted to "Good evening from Is..." with 🎉
00:35:37 Jim Spohrer (ISSIP): Reacted to "Very glad to join yo..." with 🎉
00:36:00 David Lee (UC Santa Cruz): Hello everyone! David Lee from UC Santa Cruz - looking forward to getting to know everyone 🙂
00:36:09 Jim Spohrer (ISSIP): Please add any questions/comments here in the chat
00:36:13 Jim Spohrer (ISSIP): Reacted to "Hello everyone! Davi..." with 🎉
00:36:27 Carlotta Arthur (National Academies/DBASSE): Hello everyone - thrilled to be here!
00:36:33 Jim Spohrer (ISSIP): Reacted to "Hello everyone - thr..." with 🎉
00:37:31 Nila Windasari: Glad to join, and warm hello from Indonesia :))
00:37:33 Michel Leonard: Hello everyone from Geneva! Michel Léonard
00:37:38 Jim Spohrer (ISSIP): Reacted to "Glad to join, and wa..." with 🎉
00:37:44 sakarbajagain: Hello everyone!
Sakar Bajagain from San Jose State University in San Jose, California
00:37:45 Jim Spohrer (ISSIP): Reacted to "Hello everyone from ..." with 🎉
00:37:52 Jim Spohrer (ISSIP): Reacted to "Hello everyone! Sak..." with 🎉
00:39:00 Jim Spohrer (ISSIP): Please add your perspective - Survey - add your position statement - https://tinyurl.com/ISSIPTechForGood
00:39:22 Yash Gandhi: Reacted to "Hello everyone! Sak..." with 🎉
00:39:23 Yash Gandhi: Reacted to "Hello everyone from ..." with 🎉
00:39:24 Yash Gandhi: Reacted to "Glad to join, and wa..." with 🎉
00:39:25 Yash Gandhi: Reacted to "Hello everyone - thr..." with 🎉

00:39:28 Yash Gandhi: Reacted to "Hello everyone! Davi..." with 🎉
00:39:30 Yash Gandhi: Reacted to "Good evening from Is..." with 🎉
00:39:32 Yash Gandhi: Reacted to "Very glad to join yo..." with 🎉
00:39:37 Yash Gandhi: Reacted to "Hi All and evening f..." with 🎉
00:39:53 Dr. Mohamed Naser: Although Benefits of Technology were too much, harms increased and became above the range in the last 10 years.
00:40:14 Jim Spohrer (ISSIP): Reacted to "Although Benefits of..." with 👍🏽
00:41:14 Yash Gandhi: Reacted to "Welcome everyone - J..." with 🙌🏽
00:41:38 Dr. Mohamed Naser: Replying to "Although Benefits of..."

Welcome on: https://www.linkedin.com/in/dr-mohamed-naser-60016264/
00:41:53 Jim Spohrer (ISSIP): Reacted to "Welcome on: https://..." with 👍🏽
00:44:00 Tram Nguyen: What a neat combination - engineering AND psychology! We are so blessed to have Dr. Carlotta Arthur - Thank you ISSIP!
00:44:15 Jim Spohrer (ISSIP): Reacted to "What a neat combinat..." with 🎉
00:44:26 Jim Spohrer (ISSIP): Reacted to "What a neat combinat..." with ❤️
00:46:07 Yash Gandhi: Reacted to "What a neat combinat..." with 💯
00:46:48 Michele Carroll (ISSIP): Reacted to "What a neat combinat..." with ❤️
00:46:50 Bashirat Are: Reacted to "What a neat combinat..." with 💯
00:47:02 @TerriGriffith: Reacted to "What a neat combinat..." with ❤️
00:47:40 Armon Sohirad: Reacted to "What a neat combinat..." with ❤️
00:51:03 Michele Carroll (ISSIP): Diversity of mindset as well …
00:54:46 Dr. Mohamed Naser: Replying to "Although Benefits of..."

For those interested in innovation with different variables and nations...Etc, Today: World Intellectual Property Organization (WIPO) launched the Global Innovation Index for 2023.
00:54:51 Peter Sorenson: I have friends, family, and colleagues who are neuro-typical and neuro-atypical and fully-abled and dis-abled. They add an excellent dimension of diversity to my personal and work lives!
00:55:15 Michele Carroll (ISSIP): Reacted to "I have friends, fami..." with 👍
00:57:02 @TerriGriffith: Happy to share this call for papers — my co-editor and I request authorship teams that balance social science and computing expertise in this special issue on AI and Groups and Teams: https://terri.es/SGR_AI
01:05:38 Michele Carroll (ISSIP): “A seat at the table is too late. The work is already ‘baked!’ C Arthur DBASSE
01:06:33 Dr. Mohamed Naser: Replying to "Although Benefits of..."

Report is available on the WIPO site.
01:07:15 Michele Carroll (ISSIP): React to "Report is available ..." with 👍
01:09:34 @TerriGriffith: Replying to "Although Benefits of..."

https://www.wipo.int/pressroom/en/articles/2023/article_0011.html#:~:text=Switzerland%2C%20Sweden%2C%20the%20United%20States,fastest%20climbers%20of%20the%20ranking.
01:09:41 Deb Stokes, ISSIP VP/Dell Technologies: We'll have time for a few questions for Carlotta - if you have a question for her, please add to the chat.
01:09:58 Joycie: Replying to "[Full message cannot be displayed on this version]"

Thanks Much!
01:11:33 Joycie: I had a bit of an issue logging on, until I found the link in email 👍
01:13:24 Bashirat Are: Reacted to "For who interested i..." with 👏
01:14:34 Peter Sorenson: Replying to "I had a bit of an is..."

Me too!
01:19:42 Nicole Reineke (she/her) CTO, Shift5.ai: Such important work, Carlotta!
01:19:54 Jim Spohrer (ISSIP): Reacted to "Such important work,..." with 👍🏾
01:20:04 Dr. Mohamed Naser: Reacted to "Such important work,..." with 👍
01:20:11 Joycie: Reacted to Such important work,... with "👍🏾"
01:20:21 Joycie: Reacted to Such important work,... with "👏"
01:20:24 Tram Nguyen: 🙏TY Dr. Carlotta Arthur!
01:20:38 Jim Spohrer (ISSIP): Reacted to "🙏TY Dr. Carlotta ..." with 🎉
01:21:17 Peter Sorenson: Carlotta! Excellent sharing! Thank you! There are some forces in our society that are speaking in opposition to DE&I. Do you have any experience and advice to us about how we can engage people who are skeptical on this topic?
01:21:33 Jim Spohrer (ISSIP): Reacted to "Carlotta! Excellent ..." with 👍🏾
01:21:35 Debra Satterfield, she/Her: Reacted to "Carlotta! Excellent ..." with 👍
01:21:36 Joycie: Reacted to Carlotta! Excellent ... with "👍🏾"
01:21:38 Joycie: Reacted to Carlotta! Excellent ... with "👍"
01:21:55 Alan C. Lee: Hello, great presentation- can you state a few measurable outcomes that you would say it would be helpful to think of in this realm of tech? So how do you know if it worked? Thank you.
01:22:13 Jim Spohrer (ISSIP): Reacted to "Hello, great present..." with 👍🏾
01:22:22 @TerriGriffith: This is a great audience. I bet many have leveraged tech for good. Please consider the 2024 ISSIP Excellence in Service Innovation Awards — receive recognition for your important work (and thank you for sharing with others in your network): https://issip.org/recognitions/call-for-2024-excellence-in-service-innovation-nominations/
01:23:12 Jim Spohrer (ISSIP): Reacted to "This is a great audi..." with 🎉
01:23:19 Joycie: Reacted to Hello, great present... with "👍🏾"
01:23:23 Joycie: Reacted to Hello, great present... with "👏"
01:23:32 Michele Carroll (ISSIP): Reacted to "This is a great audi..." with ❤️
01:24:09 Tram Nguyen: I believe the "opposition" comes from the varied definitions of DEI+++. I find that there are a number of different sentiments around the term
01:24:31 Debra Satterfield, she/Her: How will the dismantling of DEIA offices in the universities and the undermining of Affirmative Action affect this work at the industry levels? How can we bring forward rich and diverse voices with important perspectives in their backgrounds when we can't make things like education, healthcare and fair wages a part of our society?
01:24:44 Jim Spohrer (ISSIP): Reacted to "I believe the "oppos..." with 👍🏾
01:24:57 Jim Spohrer (ISSIP): Reacted to "How will the dismant..." with 👍🏾
01:25:07 Joycie: Reacted to How will the dismant... with "👍🏾"
01:25:13 Bert Painter: What has been useful in guiding development of multi-disciplinary efforts in our work of designing Sociotechnical Systems is the concept of "Discretionary Coalitions", which gives real purpose to the inclusion of diversity and equity to resolve a complex, ambiguous question.
01:25:19 iPad: Thank you for the presentation! Is there a framework to implement and put into practice multi disciplinary approaches? Is there active research ongoing in this area?
01:25:48 Jim Spohrer (ISSIP): Reacted to "What has been useful..." with 👍🏾
01:25:53 Jim Spohrer (ISSIP): Reacted to "Thank you for the pr..." with 👍🏾
01:26:38 Gopakumar R: Reacted to "Thank you for the pr..." with 👍
01:27:33 Jim Spohrer (ISSIP): Per Carlotta's presentation - (Bronfenbrenner,1979; Bronfenbrenner & Crouter, 1983; Bronfenbrenner & Morris, 1989)
01:27:34 Alan C. Lee: Reacted to "Hello, great present…" with 👏

01:27:49 Tram Nguyen: I agree with Dr. Arthur on longer term impact research. Especially for corporations that invest a lot of their name/reputation on it, if I were the company's leader, I'd want the most accurate research results (which comes from long-term research)
01:28:11 Jim Spohrer (ISSIP): Per Carlotta's presentation - To learn more about DBASSE: https://www.nationalacademies.org/dbasse/division-of-behavioral-and-social-sciences-and-education
01:28:20 Jim Spohrer (ISSIP): Reacted to "I agree with Dr. Art..." with 👍🏽
01:31:20 Yassi Moghaddam: Great presentation Carlotta! Thank you!
01:31:29 Jim Spohrer (ISSIP): Reacted to "Great presentation C..." with 👍🏽
01:31:29 Joycie: Great presentation Carlotta and response to great questions!
01:31:34 Jim Spohrer (ISSIP): Reacted to "Great presentation C..." with 👍🏽
01:31:53 Joycie: Reacted to Great presentation C... with "👍🏽"
01:39:01 Jim Spohrer (ISSIP): Please add your perspective - Tech For Good Survey - add your position statement - https://tinyurl.com/ISSIPTechForGood
01:44:12 Tram Nguyen: Just sharing: Game-learn (https://www.game-learn.com/en/) is a fun leadership (also includes sales and marketing team) VR-ish game scenarios that I've used for a utility service client
01:45:58 Jim Spohrer (ISSIP): Reacted to "Just sharing: Game-l..." with 🎉
01:46:10 Russell Elliott: Great presentation! Fascinating what diverse activities can be done in VR!
01:46:20 Dr. Mohamed Naser: Reacted to "Great presentation! ..." with 👏
01:46:22 Tram Nguyen: (I hope I'm in reality right now....🤪 otherwise, which dimension am I in???)
01:46:24 Jim Spohrer (ISSIP): Reacted to "(I hope I'm in reali..." with 🎉
01:46:36 Joycie: Reacted to Just sharing: Game-l... with "🎉"
01:46:38 Joycie: Replying to "Just sharing: Game-l..."

Thank you!
01:47:38 Alan C. Lee: Reacted to "Great presentation! …" with 👏
01:47:47 Joycie: Great presentation! ... with "👏"
01:48:05 Deb Stokes, ISSIP VP/Dell Technologies: We're in Zoomland ;D
01:48:56 Jim Spohrer (ISSIP): Reacted to "We're in Zoomland ;D" with 😃
01:48:58 Dr. Mohamed Naser: Reacted to "We're in Zoomland ;D" with 😇
01:50:02 Jim Spohrer (ISSIP): Service innovation is all about win-win interaction and change. Learning to change in a win-win way.
01:50:35 Michele Carroll (ISSIP): Reacted to "Service innovation i..." with 👍
01:51:14 Rasa Raghavan (she/her): David, are your students computer science majors or from multiple disciplines?
01:52:08 Jim Spohrer (ISSIP): Replying to "David, are you stud..."

Rasa, David invited some of us to his annual meeting - will put the website in the chat. The students were from all over - amazing multidisciplinary teams.
01:52:39 Rasa Raghavan (she/her): Reacted to "Rasa, David invited ..." with 👍🏽
01:53:21 Patrick Consorti: Reacted to "Rasa, David invited …" with 👌
01:53:47 Jim Spohrer (ISSIP): Replying to "David, are you stud..."

https://tech4good.soe.ucsc.edu/#/people
01:53:59 Dr. Mohamed Naser: Replying to "Service innovation i..."

Even Product innovation is about win-win...but to be accurate and in majority of cases service innovation ROI is longer.
01:55:51 Yassi Moghaddam: Reacted to "Service innovation i..." with 👍
01:55:59 Peter Sorenson: Replying to "David, are you stud..."

Wow! Interesting gaggle of humans!
01:57:19 Debra Satterfield, she/Her: What will be the ultimate human professor role in education? Is AI playing the main role in student engagement or will the professor be in this role?
01:57:29 Jen Karlin (she/they): Our program does a lot of this: Iron Range Engineering at Minnesota State University, Mankato. We love to visit with folks about it
01:57:34 Bashirat Are: This is important..we found this with our interns that exposing them to business systems early on helps prepare them for the professional digital world.
01:57:51 Jim Spohrer (ISSIP): Replying to "David, are you stud..."

McGowan I,T,X-shaped learners - https://www.thinkbeyond.co.nz/blog/x-shaped-learner/
01:58:05 Joycie: Reacted to Service innovation i... with "👍"
01:58:10 Jim Spohrer (ISSIP): Reacted to "This is important..w..." with 👍🏽
01:58:17 Joycie: Reacted to This is important..w... with "👍🏽"
01:58:26 Jim Spohrer (ISSIP): Reacted to "our program does a l..." with 👍🏽
01:58:35 Jim Spohrer (ISSIP): Reacted to "What will be the ult..." with 👍🏽
02:00:24 @TerriGriffith: Replying to "What will be the ult..."

I'll argue for a combined role. Watching the University of Michigan with great interest. They've rolled out custom tools: https://genai.umich.edu/
02:00:35 Jim Spohrer (ISSIP): Reacted to "I'll argue for a com..." with 👍🏽
02:02:38 Jim Spohrer (ISSIP): AI, VR-AR, Digital Twins - all are advanced with more compute, data, and hopefully at lower and lower energy requirements 😊
02:03:10 Michele Carroll (ISSIP): Reacted to "AI, VR-AR, Digital T..." with 😃
02:04:26 Carlotta Arthur (National Academies/DBASSE): Replying to "What will be the ult..."

We have to think about how people learn as we think about new technologies in classrooms: please see this National Academies Board on Science Education Report https://nap.nationalacademies.org/catalog/24783/how-people-learn-ii-learners-contexts-and-cultures
02:04:40 Peter Sorenson: Replying to "David, are you stud..."

Powerful Ideas: The X-shaped learner moves in the transdisciplinary space where learning includes interdisciplinarity with a participatory approach and a more holistic focus on a common goal. Learning in this space often focuses on a problem of society at large, such as climate change and global warming.
02:04:49 Peter Sorenson: Reacted to "our program does a l..." with 👍🏽
02:05:02 Jim Spohrer (ISSIP): Reacted to "Powerful Ideas: The ..." with 👍🏽
02:05:05 Andrzej Rucinski: Great presentation!
02:05:08 Peter Sorenson: Reacted to "AI, VR-AR, Digital T..." with 😃
02:05:17 Carlotta Arthur (National Academies/DBASSE): To Debra's question, about the role of human professors, we have to think about how people learn as we think about new technologies in classrooms: please see this National Academies Board on Science Education Report

https://nap.nationalacademies.org/catalog/24783/how-people-learn-ii-learners-contexts-and-cultures
02:05:28 Jim Spohrer (ISSIP): Reacted to "To Debra's question,..." with 🎉
02:06:02 Michele Carroll (ISSIP): Reacted to "To Debra's question,..." with 👍
02:06:05 David Lee (UC Santa Cruz): Replying to "David, are your stud..."

@Rasa Raghavan (she/her) yes, the students are from diverse disciplines. Many CS majors, but also many cognitive science/psychology and arts. Have had anthropology and English majors. All really important, especially since user research and design are a big part of the process (not just technical development)
02:06:17 Jim Spohrer (ISSIP): Reacted to "@Rasa Raghavan (she/..." with 🎉
02:06:24 @TerriGriffith: Crucially, the tech is only good if the organizational techniques change alongside. Prof. Matt Beane in Wired (paywall) https://www.wired.com/story/med-students-are-getting-terrible-training-in-robotic-surgery/ or the Academic version: https://journals.sagepub.com/doi/10.1177/0001839217751692. My take on this study is that the med schools didn't do enough to adjust the broad systems. Thinking about access to simulators, adjusting for the different views given by the robotic systems. You can't change just one thing and expect tech to be good. Deeper dive on the process of the research https://asqblog.com/2020/05/01/beane-2019-shadow-learning-building-robotic-surgical-skill-when-approved-means-fail/
02:06:25 Joycie: Reacted to @Rasa Raghavan (she/... with "🎉"
02:06:26 Joycie: Reacted to Powerful Ideas: The ... with "👍🏽"
02:06:38 Rasa Raghavan (she/her): Reacted to "@Rasa Raghavan (she/..." with 🎉
02:06:51 Jim Spohrer (ISSIP): Reacted to "Crucially, the tech ..." with 👍🏽
02:06:59 Dr. Mohamed Naser: Replying to "Great presentation!"

It reflects a Powerful processing within Nvidia...
02:07:17 Jim Spohrer (ISSIP): Reacted to "It reflects a Powerf..." with 👍🏽
02:07:20 Peter Sorenson: Replying to "What will be the ult..."

As a former professor I am excited that these technologies will make it a much easier, more effective learning process that the prof can design and facilitate while putting the learner in a place where they can exercise initiative. More learning for the prof too!
02:07:37 Peter Sorenson: Replying to "What will be the ult..."

Co-Creating Knowledge as a learning model.
02:07:42 Jim Spohrer (ISSIP): Reacted to "Co-Creating Knowledg..." with 👍🏽
02:07:51 Joycie: Thank you very much for the shared links!
02:08:15 @TerriGriffith: Reacted to "Co-Creating Knowledg..." with 👍🏽
02:08:47 Debra Satterfield, she/Her: Reacted to "To Debra's question,..." with 👍
02:08:51 Jim Spohrer (ISSIP): Reacted to "Thank you very much ..." with 👍🏽
02:09:07 David Lee (UC Santa Cruz): Replying to "What will be the ult..."

Yes, resonate with all this!
02:09:09 Dr. Mohamed Naser: Reacted to "Crucially, the tech ..." with 👏
02:09:50 Renee Yao (Nvidia): Here are some of the links I shared. NVIDIA Deep Learning Institute: https://www.nvidia.com/en-us/training/online/

NVIDIA Inception for startups: https://www.nvidia.com/en-us/startups/

NVIDIA healthcare: https://www.nvidia.com/en-us/clara/

NVIDIA earth-2: https://www.nvidia.com/en-us/high-performance-computing/earth-2/

NVIDIA GTC 2024: https://www.nvidia.com/gtc/
02:09:57 Debra Satterfield, she/Her: Replying to "To Debra's question,..."

I just downloaded the book at this link and realized I have used the first version. I have honors students doing research and surveys on AI and human roles in education right now 🙂
02:09:58 Russell Elliott: Very interesting to see all the medical applications for AI!
02:10:03 Tram Nguyen: TY Renee! I'm so impressed and amazed about the healthcare arm of NVIDIA. I didn't know about those particular tech-based solutions you all are working with
02:10:18 Renee Yao (Nvidia): Reacted to "It reflects a Powerf..." with 👍🏾
02:10:28 Tram Nguyen: Reacted to "Here are some of the..." with 🙏🏻
02:10:40 Renee Yao (Nvidia): Reacted to "Very interesting to ..." with 👍
02:10:50 Renee Yao (Nvidia): Reacted to "TY Renee! I'm so imp..." with 👍
02:11:49 Carlotta Arthur (National Academies/DBASSE): Replying to "To Debra's question,..."

That's great Debra!
02:12:36 Dr. Mohamed Naser: Replying to "Very interesting to ..."

From early 1970 expert systems (AI type) were supporting Health care sector..
02:13:16 Joycie: Fantastic information from all panelists! I'm new to these technologies.
02:13:22 Michele Carroll (ISSIP): Reacted to "TY Renee! I'm so imp..." with 👍
02:13:32 Michele Carroll (ISSIP): Reacted to "Very interesting to ..." with 👍
02:13:55 Michele Carroll (ISSIP): Reacted to "Fantastic informatio..." with 👍
02:14:40 Rasa Raghavan (she/her): Replying to "What will be the ult..."

David, any lessons learned in your research to help everyone on a multidisciplinary team feel included and successful?
02:15:42 Dr. Mohamed Naser: Replying to "Very interesting to ..."

developments keep moving positively in a solid way within medical sector...
02:15:52 Deb Stokes, ISSIP VP/Dell Technologies: Questions for the panelists? Please add to chat.
02:17:55 Peter Sorenson: Journey maps and empathy maps have been techniques we have used for a long time. How is this use of “Systemic Compassion” an advancement on these approaches we have previously been using?
02:18:20 Debra Satterfield, she/Her: Reacted to "Journey maps and emp..." with 👍
02:19:24 Joycie: Reacted to I’ll argue for a com... with "👍🏾"
02:19:32 Joycie: Reacted to What will be the ult... with "👍🏾"
02:19:39 Peter Sorenson: “First point of friction”
02:21:10 David Lee (UC Santa Cruz): Replying to "What will be the ult..."

These are not all from my own research, but I’ve found that these have helped: 1) having intentional relationship-building (time carved out for getting to know each other in meetings, quarterly social events), 2) ensuring that everyone has clear roles/goals where they feel they are contributing, 3) having appropriate structure/process that helps teams to understand how their contributions build on each other, 4) having students practice communicating emotions and give healthy direct feedback

02:21:19 Peter Sorenson: Product Design, User Interface, Architecture Design - integration of disciplines + nuances
02:21:35 Jim Spohrer (ISSIP): Reacted to "Product Design, User..." with 👍🏾
02:22:09 Dr. Mohamed Naser: Reacted to "Product Design, User..." with 👍🏾
02:22:51 Peter Sorenson: Relationship Map, Journey Map, Empathy Map - Using a systemic perspective
02:22:52 Joycie: Reacted to Here are some of the... with "🙏🏻"
02:23:49 Debra Satterfield, she/Her: Reacted to "These are not all fr..." with 👍
02:23:52 Saba Kheirinejad: Reacted to "These are not all fr..." with 👍
02:24:05 Debra Satterfield, she/Her: Reacted to "Product Design, User..." with 👍
02:25:22 Yassi Moghaddam: Great presentations @Venita, @David, @Renee, @Nicole! Thank you!
02:25:23 Jim Spohrer (ISSIP): Good tough question! :-)
02:25:29 Renee Yao (Nvidia): Reacted to "Great presentations ..." with 👍
02:25:34 Joycie: Reacted to Great presentations ... with "👍"
02:25:36 Debra Satterfield, she/Her: Reacted to "Good tough question!..." with 👍
02:25:43 Joycie: Reacted to Great presentations ... with "👏"
02:25:51 Jim Spohrer (ISSIP): Possible harms: Safety, weaponization, etc.
02:25:53 Joycie: Reacted to Good tough question!... with "👍"
02:26:07 Jim Spohrer (ISSIP): Possible harms: Unintended consequences
02:26:27 Peter Sorenson: When I was teaching entrepreneurship in an engineering school I prepared an MS PPT presentation that was a Pictorial Journey Map for electricity from generation to use. Simple pictures and arrows. I was surprised and delighted that the simple 12 slide journey map /diagram changed the whole nature of the conversation and was an entrée to the topic of complex adaptive systems.
02:26:31 Jim Spohrer (ISSIP): (Harm reporting is important system level)
02:26:47 Jim Spohrer (ISSIP): (Social-behavioral scientists can help a lot)
02:26:53 Russell Elliott: There's isn't ever black or white; everything has nuance; I don't think there is any innovation that is purely good, as some negative consequences occur both directly or by proxy. Reminds me of a question of what horses would think (if they were capable of thinking) of the invention of cars, and how that parallels with people's thoughts of AI potentially replacing them in their fields.
02:27:02 Jim Spohrer (ISSIP): Reacted to "There's isn't ever b..." with 👍🏾
02:27:05 Joycie: Reacted to There's isn't ever b... with "👍🏾"
02:27:12 Joycie: Reacted to (Social-behavioral s... with "👍"
02:27:21 Nicole Reineke (she/her) CTO, Shift5.ai: @peter - it is amazing how drawing a picture is able to deeply ground a conversation and ensure everyone is on the exact same page and not talking past each other
02:27:27 Yassi Moghaddam: Reacted to "There's isn't ever b..." with 👍🏾
02:27:29 Joycie: Reacted to (Harm reporting is i... with "👍"
02:27:32 Peter Sorenson: Harm is often discounted by those in power. As a Vietnam Veteran harmed by Agent Orange I have an opinion about that.
02:27:41 Jim Spohrer (ISSIP): Reacted to "Harm is often discou..." with 👍🏾
02:27:48 Peter Sorenson: Reacted to "@peter - it is amazi..." with 👍
02:27:53 Peter Sorenson: Reacted to "@peter - it is amazi..." with ❤️
02:28:16 Alan C. Lee: @Jim Spohrer (ISSIP) How about the health tech - as microscope? As the starter? Always there is harm to all modern tech
02:28:19 Joycie: Reacted to Harm is often discou... with "👍🏾"
02:28:23 Joycie: Reacted to @peter - it is amazi... with "❤️"
02:28:28 Jim Spohrer (ISSIP): Reacted to "@Jim Spohrer (ISSIP)..." with 🎉
02:28:32 Peter Sorenson: Reacted to "@Jim Spohrer (ISSIP)..." with 👍

02:28:36 Jim Spohrer (ISSIP): ISSIP
Home Page: https://www.issip.org
Membership Registration: https://www.issip.org/register
02:28:44 Hanna Yehuda (she/her): Reacted to "@peter - it is amazi..." with ❤️
02:28:46 Dr. Mohamed Naser: Thank you All...
02:28:51 Nicole Reineke (she/her) CTO, Shift5.ai: @alan - the increase in digital storage is a tradeoff for started
02:28:52 David Lee (UC Santa Cruz): Replying to "What will be the ult..."

On the ultimate human professor role in education, I think professors will be guides augmented by AI to better facilitate/organize/highlight/point people to resources/etc. more to say, big question!
02:28:55 Frank Odasz: Wonderful event, smart speakers, unlimited potential. Thanks.
02:28:55 Jim Spohrer (ISSIP): Thank-you all for presentation and engaged participants
02:28:56 Yassi Moghaddam: Thank you Michele, Jim, and Deb for a great DS!
02:29:10 Deb Stokes, ISSIP VP/Dell Technologies: Thank you all for joining! Great comments from the audience!
02:29:17 Hanna Yehuda (she/her): Great presentations! thanks.
02:29:19 Alan C. Lee: 👏thank you
02:29:23 Peter Sorenson: Michelle and Team! Well done!
02:29:25 Debra Satterfield, she/Her: Great event, Thanks ISSIP for offering this!
02:29:28 Joycie: Thank you everyone! And chat folks- amazing learning curve for me! Cheers!
02:29:47 Carlotta Arthur (National Academies/DBASSE): Thank you everyone!
02:29:56 Michel Leonard: Thank you everyone for this great event!
02:30:00 Russell Elliott: Amazing presentation! It's quite amazing getting insight into the broad applications of tech and AI for good. I hope to stay engaged with your organization and conferences!
02:30:12 Andrzej Rucinski: Thank you - Greetings from Poland
02:30:19 Jim Spohrer (ISSIP): Call for nominations - organize nominate an innovation - https://issip.org/recognitions/call-for-2024-excellence-in-service-innovation-nominations/