

Task Force 3: Science and Digitalization for a Better Future



People-Centered Science and Digital Transformation: A Practical Proposal for the G7 and G20

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Abstract

To increase the benefits of scientific research and innovations in frontier technologies and digitalization, coordination, collaboration, trust building, and knowledge sharing between the Group of Seven (G7) and Group of Twenty (G20) countries and the rest of the world are crucial. Although breakthroughs in these fields are making progress toward achieving the United Nations (UN) Sustainable Development Goals (SDGs), a significant digital gap exists, hindering the effective implementation of progress. Often, the participation and engagement of ordinary people are an afterthought but are essential to creating sustainable processes for applying and scaling the implementation of scientific and digital breakthroughs so that all communities can become resilient.

Therefore, we propose the creation of the “Sustainable Prosperity Network”: a people-to-people network that harnesses science and data-driven digitalization to increase interoperability and integration between existing initiatives and global institutions in fulfilling global challenges. By connecting physical and digital communities with the goal of empowering ordinary people to participate meaningfully in policy making and innovation processes, we can act together to achieve results that will vastly increase the positive impact of science, frontier technologies, and digitalization. With minimal commitment from the G7 and G20 processes, the Sustainable Prosperity Network can expedite collaboration among key stakeholders, create resilient communities capable of meeting global issues like the climate challenge and multidimensional inequalities, and ultimately achieve the UN SDGs by 2030. A Sustainable Prosperity Network approach ensures that the G7 and G20 processes have an opportunity to effectively coordinate their respective efforts to build trust and share knowledge. We can increase the benefits of science, frontier technologies, and digitalization in a manner that facilitates “glocal”¹ development breakthroughs that can be scaled and adapted for various local contexts, while accelerating progress toward a more equitable and resilient world.

Challenges

Despite significant progress, our societies still live in a world of peril highlighted today by the perfect long storm (Shanmugaratnam 2022) of climate change, multidimensional inequalities, and conflicts such as the one in Ukraine. While we have developed a potential wealth of solutions (UN 2023; ISC 2021) we are not able to implement them rapidly and effectively. At the current pace, the world will not achieve the Sustainable Development Goals (SDGs) until 2092 (Social Progress Imperative 2020). These problems demand significant transformations in economies and societies and must engage all people. We lack a “loom” for weaving our diverse initiatives and the data we generate, to create a tapestry of resilience within and across countries.

¹ Describing the seamless integration between the local and global (Mayhew 2015).

Innovations to solve these problems need to be tailored to local requirements. Therefore, global actors must have access to local ideas to develop solutions with local people. Digitalization has the potential to allow for greater participation and representation of local perspectives, but we have not fully utilized our digital capabilities to facilitate effective participation in the decision making of innovation processes (Bertolaso, Capone, and Rodríguez-Lluesma 2022). The science and technology ecosystem's relatively small population has yet to achieve more meaningful participation from stakeholders that represent the majority of society. Meanwhile, in an accelerated digital transformation driven by corporate-driven technologies, only 14% of global digital technology companies are committed to digital inclusion (WBA 2023). We lack channels and venues where people can voice their priorities and needs and participate in public discussions to navigate the rapid digitalization of socioeconomic activity. This gap is due to the digital divide that exists in three areas.

First, at the community level, especially in low- and middle-income countries (LMICs), the widening digital divide is blocking people's participation in society and therefore the coordination needed to achieve the UN SDGs by global and local institutions. LMICs face a double burden of insufficient investments in research and development (R&D) to support contextually relevant innovations and instability when they cannot respond to high risks of displacement of jobs from automation. Nowadays, innovation tends to be shaped by high-income countries' regulations and assumptions, which lack universality (Maccaro et al. 2022). Furthermore, since R&D, product and service design, and marketing are largely undertaken in high-income economies, many people in LMICs risk becoming only consumers of products and services in which they had a minimal role in developing.²

Second, the digital divide exists at the individual level, where intersectional barriers hinder the development of sufficient pathways for vulnerable groups to participate more inclusively to enable career development in science, technology, and innovation (STI) ecosystems. For instance, women form only 23% of the technical workforce in digital companies (WBA 2022). There is a noticeable lag in opportunities for skills development for differently abled people (WEF 2021). Additionally, language barriers,³ the rural-urban divide, and lack of meaningful connectivity⁴ prevent many people from accessing key resources, putting them at risk of being left behind.

Third, the digital divide exists between individuals and data-collecting entities. Currently, a few players hold huge amounts of data about individual people, to which the people themselves no longer have access. Data monopolies have shown their limits for ensuring safety and security of economic activity (Biancotti and Ciocca 2019). It is a matter of concern that the use of frontier technologies such as artificial intelligence (AI) and cloud computing by big technology companies and key stakeholders in finance and technology ecosystems threatens to amplify existing marginalization (Ahmed 2021). Only 22% of global big technology companies have ethical AI principles in place to guide their businesses (WBA 2023). Consequently, over prolonged periods, limited accountability between civil society organizations, governments, businesses, and the global

² There are projects working to change that. One example is a World Intellectual Property Organization initiative to motivate small and medium-sized enterprises in Argentina and Morocco to choose design-led strategies (Jewell 2016).

³ Today using the internet largely requires knowledge of English (Richter 2022), which is spoken by less than one-seventh of the world, putting a vast majority of the world at a disadvantage.

⁴ The coverage gap affects 7% and the usage gap 40% of individuals worldwide (Giga and BCG 2021).

multilateral system erodes trust. This results in siloed thinking and measures, such as accounting techniques, ethical frameworks and policies, which ultimately disregard key aspects of cultural and social contexts necessary for holistic development processes.

Proposal

In the 13th century “*Landsgemeinden*” (rural communities) in Switzerland gathered all eligible citizens in open-air venues to discuss political matters and vote by a show of hands (HLS 2021). Similar systems existed in various parts of the world even earlier, such as in Greece and in India (Witzel 1997; Yonezawa 1991). However, this level of participative democracy has become unfeasible at least since the era of nation states. A whole field of science is dedicated to addressing the challenge of ensuring the will of the people is reflected in decision making despite supra-regional structures (Bertolaso and Sterpetti 2020). With increased hyper globalization, individual country solutions are inadequate to address the need for democratic processes that include meaningful participation from ordinary people.

Digitalization has the potential to allow for greater participation and representation of local perspectives, and hence support local STI processes, which can be harnessed to promote collective well-being in all aspects of life, including on a global scale. However, this potential is not yet tapped. Despite having technology at our disposal to implement participatory democracy, forms of participation by ordinary people in global decision making are limited. A “glocal” approach is required as it captures the transnational challenges, interdependencies between nations, and our ever-increasing interconnectedness (UNEN 2020).

Given the persistent global digital divide (Dutta, Geiger, and Lanvin 2015), can we democratize the way we engage and shape digital technology? Innovative approaches, such as design thinking, which have often helped digital technologies make their breakthroughs in the private sector, could provide insight to overcome the digital divide (Plattner, Meinel, and Leifer 2015).

We propose the creation of the Sustainable Prosperity Network (SPN), which incorporates three of the common design principles found in most platforms for good (Zapata and Lobo 2022):

1. Distributing the ability to solve problems
2. Empowering local stakeholders with data and knowledge
3. Cultivating positive change offline

The SPN envisions local communities as key stakeholders that create solutions and innovations for global problems. It places communities at the center of a network for civic, corporate, and government stewardship. We can build the future we want for ourselves and for the next generations, based on five key principles:

- (i) Develop channels and venues for people-centered common use and dialogue that serve as stewards for integrating diverse stakeholders, supporting a sustainable planet. With participation and feedback systems we can prioritize stewardship of people and planet, and ethical goal fulfillment. Across people, products, and service life cycles, tracking geographically dispersed data over time and documenting, we can assure access to science for all.

- (ii) Increase local chances for innovation and commercialization.⁵ Adapting to integrate global knowledge and implement locally different solutions⁶ can harness diverse local and cultural talents. Meaningfully engaging local people as problem identifiers and solvers can validate and legitimize scientific and digital innovations.
- (iii) Encourage governments to create policies that offer tax breaks, technology subsidies, and other incentives to encourage commitment from digital technology companies to fast-track digital inclusion.
- (iv) Develop ethics on the foundation of science and digitalization with participation from communities (Bertolaso, Capone, and Rodríguez-Lluesma 2022). On a local level, methodological and ethical boards must be connected over a global-level interdisciplinary network. By documenting local practices, policies and decisions, each community can learn from the global interdisciplinary network.⁷
- (v) Strengthen collaboration in R&D by supporting open-innovation ecosystems and building on existing initiatives, like National Research and Education Networks (NRENs).⁸ The G7 and G20 can lead the way by enabling market discovery and opportunities for local players to participate in finding context-specific solutions.

By implementing these principles, we can ensure that people's needs are met while also having accountability (Bertolaso 2019; Bertolaso and Rocchi 2020). We must work at different levels and scales, considering contextual and territorial characteristics. By harnessing the power of digital technologies and facilitating people engagement, we can promote collective well-being and develop sustainable solutions for the challenges facing our world today.

Implementation

The SPN aims to help the G7 and G20 in unleashing the power of local changemakers who can solve problems globally. Innovative ideas can be gathered from around the world, then customized and improved to meet the specific needs of local communities through collaboration and constant refinement.

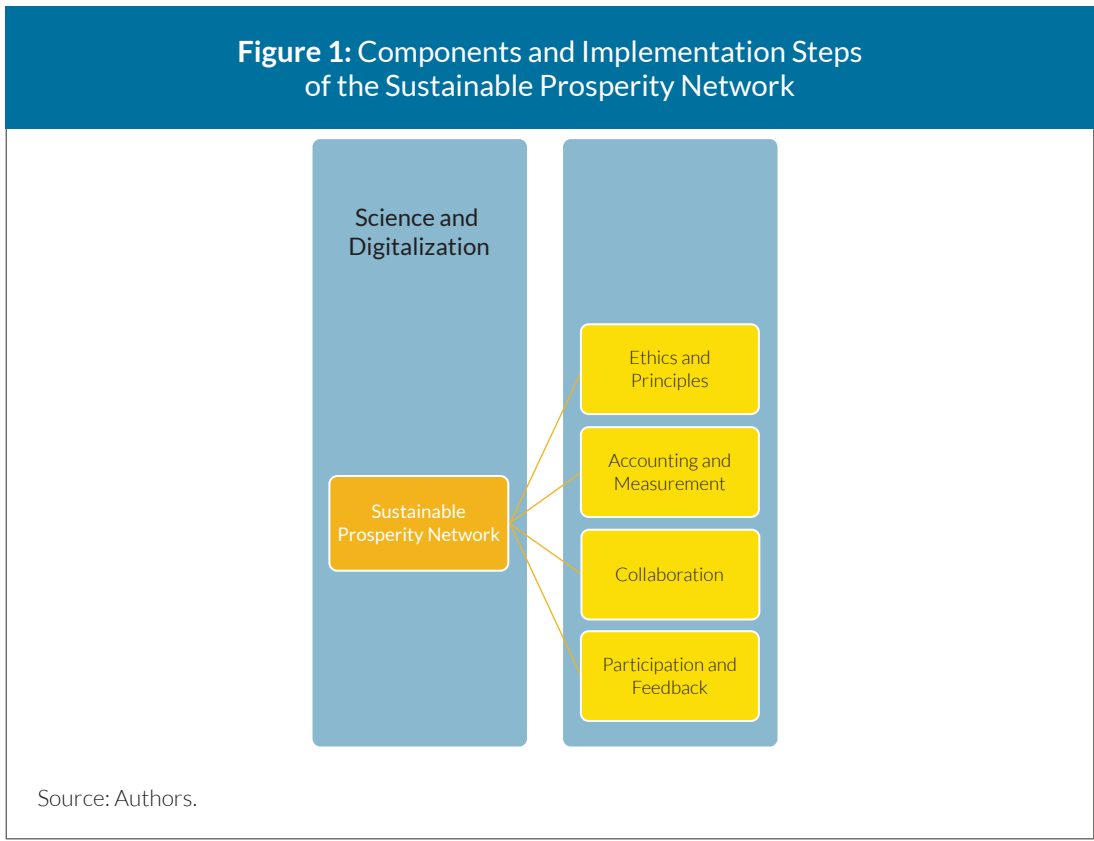
The scaffolding for the SPN will have four components (Figure 1). The first component is focused on **ethics and principles**, which will inform the second component, **accounting and measurement**. These two components will then inform the third component, effective **collaboration** and scientific and digital interoperability. Finally, the SPN will provide **participation and feedback** mechanisms that allow for real-world interactions, similar to online testing and tracking, to determine whether an innovation works.

⁵ Examples are the Gatekeeper's community and projects that aim to overcome the digital divide of the elderly in the healthcare field (Gatekeeper Project 2023) and the US Census Bureau setting up a digital cross-sector sandbox in Puerto Rico to assure equitable recovery and resilience (US Census Bureau 2022).

⁶ Some examples and issues related to healthcare processes and technological advancements can be found in Ienca et al. 2022.

⁷ During the time of the Magna Carta, in the United Kingdom, Justices of the Peace were set up and local volunteers in good standing in the community made decisions to keep the peace. Case precedents could be cited from other communities. Over 700 years, the British Common Law evolved (Skyrme 1991).

⁸ NRENs are specialized internet service providers dedicated to supporting the needs of the research and education communities within their own country (NREN, 2023).



(i) Ethics and Principles

The SPN will play a crucial role in building a framework with a focus on improving net societal welfare. Developing common goals and principles that can track and regulate scientific and digital developments will involve locally-convened review boards to address the various issues on an ongoing basis. Documenting decisions will provide precedents that can be cited by other boards.

The myriad of contributions to decisions across the SPN will enable the emergence of guiding principles for the responsible stewardship of ethical and trustworthy technology, based on real-life cases. These guiding principles can inform the national policies of the G7 and G20 member states, and international cooperation can be based on the data and evidence of actual real-world cases to guide us on how technology should be developed, used, and implemented for the public good.

An urgent example and critical starting point is AI security and safety. Given the potential for militarization and weaponization of AI, the SPN can supervise and implement mechanisms to govern such adverse outcomes (Kissinger, Schmidt, and Huttenlocher 2023). It is essential to consider the perspectives of experts and the experience of people from lower-income countries and incorporate them to strengthen the reach and positive impact of international frameworks (Pecchia et al. 2020).

Another key area is the development of principles and policies that incentivize technology companies to publicly and statistically track and promote inclusive participation. These principles will feed into policy think tanks that can offer various levers to generate inclusive outcomes,

including trade and tax policy, government procurement recommendations, and improve the ease of doing business in the countries where they operate. Additionally, tracking mechanisms for participatory engagement should be established to ensure transparency and accountability.⁹

(ii) Accounting and Measurement

Developing globally accepted and adhered financial and social accounting, measures, and checkpoints to ensure active monitoring (Singh et al. 2022) and path correction of the principles outlined above requires a methodological foundation for data analysis and modeling multi-scale and context-dependent dynamics to create common solutions that can be implemented at different levels.

The next steps in this process involve designing needs assessments and impact evaluations for digital citizenship and digital economy to build the foundation in data and knowledge for evidence-based policy decisions for digital inclusion. This approach can feed into the post-SDG agenda and enables business leaders and policy makers to develop knowledge to make better decisions that achieve the desired impact and minimize harm to stakeholders.

There will be specific efforts to improve accounting for the informal economy, which are accounted for in most countries by extrapolation of sample surveys. Transactions not captured in financial statistics will thus be included (from records of mobile and electronic transactions). Next, economic activity undertaken without financial records can be captured using technology. For instance, childcare activity undertaken by family members can be fed into government statistical systems using participatory mobile phone applications.

Accounting and measurement being pioneered in initiatives for sustainability accounting¹⁰ requires the need for international frameworks for data sharing, such as the European Union's (EU) Health Data Space, which should be extended beyond the EU and to include LMICs where most of the world's population resides (European Commission 2022). Proposals for new models for data sharing emerged during the G7 summit in Germany included Digital Utilities for Scientific Research (Fung et al. 2022) and Digital Public Goods (Fischer et al. 2022), which build on the UN Digital Cooperation Roadmap.¹¹

⁹ For example, Particip.ai, a voice enabled conversational AI can get feedback from a million people and organize the feedback in the methods shown in planning for the Puerto Rico Prosperity Initiative in The Opportunity Project organized by the US Census Bureau (US Census Bureau 2022).

¹⁰ The International Sustainability Standards (IFRS) Board sets a clear path for the Sustainability Accounting Standards Board (SASB) when it launched draft IFRS Sustainability Disclosure Standards, explaining how initially the industry-based SASB Standards can help companies identify their sustainability risks and opportunities along with metrics to use in their disclosures. The SASB Standards provide disclosures across a range of sustainability matters and, over time, will inform the industry-based requirements in the IFRS Sustainability Disclosure Standards (SASB).

¹¹ "Digital technology is shaping history. But there is also the sense that it is running away with us. Where will it take us? Will our dignity and rights be enhanced or diminished? Will our societies become more equal or less equal? Will we become more, or less, secure and safe? The answers to these questions depend on our ability to work together across disciplines and actors, across nations and political divides. We have a collective responsibility to give direction to these technologies so that we maximize benefits and curtail unintended consequences and malicious use." Antonio Guterres, UN Secretary-General introduction to the Digital Cooperation Roadmap (UN 2020).

(iii) Collaboration

To foster a culture of innovation and entrepreneurship that addresses systemic issues, we propose setting up a collaboration space that brings together science and technology research communities and open-innovation ecosystem players.

The collaboration space supports scientific communities through community learning and living labs, which identify challenges and opportunities and explore ways to conduct high-quality research that positively impacts marginalized communities. This will involve identifying research opportunities and resources that can help bridge the digital divide, supporting open standards, and publishing results. To ensure innovators consider the real needs of LMICs, clear guidance is offered (Piaggio et al. 2021).

In addition, the collaboration space provides a platform for communities and civic organizations to offer market discovery opportunities for innovation hubs and co-build solutions to address developmental and inclusion challenges. The measurement group will complement these efforts by identifying problems and solutions that maximize both social and private welfare.¹²

(iv) Participation and Feedback

The key to implementing problem-solving innovations effectively at a local level is to ensure that everyone involved is included in an action-oriented learning framework. The SPN will achieve this by using the Plan-Do-Study-Act (PDSA) cycle method (IHI 2020).

Once the collaborative level has defined new goals for a local target group and established measurement indicators, these goals and indicators are tested, monitored, and evaluated in the real world. Based on the results, the goals and indicators are adjusted and retested at the collaborative level.

Risks

The lack of a level playing field poses a primary risk that could prevent LMICs from fully participating in the SPN. These countries often do not have the necessary policies and network effects to take full advantage of the digital era. However, to build initial momentum, the platform will proceed with universally accepted principles of digital development that can benefit all participating countries, regardless of their economic status (Digital Principles website). For policies that may have winners and losers, the collaboration component of the platform will foster the dialogue for development of policy design and instruments that lead to inclusive and just outcomes.

¹² One example of such a collaborative space are the United States Health Resources and Services Administration Breakthrough Collaboratives. In a trusted social network, health practitioners at the local level can share insights to address national health challenges. This has significantly accelerated the patient-centered innovation process in the health sector (Calvo and Fung 2015).

To ensure policies are fair, the people who will be affected by them must be involved. Ideally, policies should be co-designed with the people they will serve. The “not about us without us” approach should apply to all stakeholders, regardless of their demographics or social status.

Geopolitical tensions may inhibit ethical and scientific collaboration, which could undermine joint initiatives in science and digitalization. To avoid such risks, scientific and professional journals, international professional associations, university research networks, and standards development organizations should steer away from geopolitics whenever possible. The SPN can mitigate geopolitical risks by incorporating participation and feedback systems that enable people to voice their opinions on what works best for them and what advances science, resilience, and the UN SDGs.

The challenges and proposals addressed by the SPN go beyond the first phase of implementation. By harnessing the power of the people to solve problems relevant to their day-to-day lives and the future of their children, we address broader and deeper issues more sustainably.

Why this Structure will Work

The SPN is an adaptive framework where new and existing collaborative initiatives can be incorporated to avoid duplication of efforts by deeply engaging with current initiatives and which can also reap the benefits.

Convergence and amplification (instead of duplication) of ideas: The SPN aims to strengthen and improve practices to achieve the goals of global institutions such as the International Science Council, the SDG Action Campaign, or the “Our Common Future” Report of the World Commission on Environment and Development. The ongoing work in the respective areas will be strengthened through a deeper discussion by highlighting different opinions and solutions. By systematically harnessing data from implementation and improving practices, we provide a “use-case” approach to support on-the-ground adaptive action at scale which allows for diverse cultural situations. Given that various organizations have their own agendas, the SPN will bridge the chasm that today there is no clearinghouse of global cases and decisions. Together developing the rules for setting up a clearinghouse will immeasurably enrich the dialogue: Being able to cite use cases and data, differences between stakeholders can be discussed scientifically and statistically with data that digitalization offers.

Free and fair platform for dialogue: The informal nature of the G7 and G20 make them a conducive platform for free and frank opinion sharing. Using the G7’s and G20’s parallel tracks with ministries of finance and other working groups, the SPN platform will ensure that action-oriented items get heard by the right people.

Minimal financial commitment needed: The collaboration needs minimal financial commitment as it can be undertaken as part of ongoing G7 and G20 working group activities and integrate existing initiatives underway in parallel in different countries. When action-oriented items are agreed on, the G7 and G20 network can reach out to multilateral agencies, such as the African Development Bank, the Asian Development Bank, the Inter-American Development Bank, and the World Bank for providing financial and knowledge resources.

Participation strengthens the impact of science and digitalization: Institutions such as the International Science Council greatly increase international scientific exchange and thus the problem-solving power of science. When such institutions are complemented by people participation in community learning and living labs, we mobilize the hidden reserve of our innovative powers to solve our global problems. The G7 and G20, through the SPN, will have the opportunity to demonstrate how science is relevant to everyday lives and provide pathways for ordinary people to contribute to achieving the UN SDGs and meeting the climate challenge, and in the process making their own lives and the communities they live in more resilient.

Conclusion

The Sustainable Prosperity Network proposed in this brief is a novel and practical solution to the pressing issues in digitalization, science and technology. The network recognizes the vital importance of community participation in addressing these issues, which has been notably missing in the current institutional framework. To address this gap, the SPN will build upon the existing institutional strengths, while simultaneously opening up an avenue for people's participation into a system that has traditionally felt inaccessible and siloed. In this manner, the SPN presents a strategic option for the G7 and G20 to enable greater participation of its people to shape a desirable and sustainable future.

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Think7 (T7) is the official think tank engagement group of the Group of 7 (G7). It provides research-based policy recommendations for G7 countries and partners. The Asian Development Bank Institute (ADBI) is the lead chair of T7 under Japan's 2023 G7 presidency.