GENEVA GRADUATE INSTITUTE

INSTITUT DE HAUTES ÉTUDES INTERNATIONALES ET DU DÉVELOPPEMENT

GRADUATE INSTITUTE OF INTERNATIONAL AND DEVELOPMENT STUDIES

Final Report

ARP 49: Geneva Digital Governance Hub

Master in International and Development Studies (MINT)

Spring Semester 2024

MINT317: Applied Research Project Foundation

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Submission date: 20/05/2024

Word count: 10'027

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Executive Summary

Based on case studies, interviews, and foresight analysis, this report explores how Geneva can maximize its potential as a global digital governance hub by enhancing its collaborative ecosystem. Our literature review highlights the fragmentation of initiatives, the rigidity of existing governance models and institutions, and a growing need for an inclusive approach to involve private actors.

Our case studies in Geneva indicate that governance frameworks are emerging sector by sector. In contrast, external hubs like Silicon Valley and China show different collaborative models where private actors play a larger role, are less risk-averse and include more economic considerations.

Interviews with experts from international organizations and civil society highlight the difficulty of establishing a common regulatory framework due to varying regional visions. Bringing all the actors to the table within the traditional UN system is challenging, especially since private actors play an increasing role in digital governance. From the private sector's perspective, a gap to the public sector still persists, highlighting the need to promote tech literacy and education. The Swiss State's perspective emphasizes the importance of enhancing tech diplomacy, collaboration with companies and researchers as well as the inclusion of the Global South. Finally, the academic perspective confirms a clear fragmentation and decentralization of digital governance, needing to be addressed.

Our foresight analysis presents four possible scenarios, evaluated in our foresight workshop:

1. International Geneva becomes a governance innovator and leader in one sector/specialization,
2. International Geneva becomes a central hub for governance discussions and instruments linking regional hubs,
3. International Geneva becomes irrelevant and the fragmented world is led by alternative, BRICS+ multilateral structures, and
4. International Geneva manages to build cross-sectoral partnerships and a collaborative ecosystem.

Following the evaluation of these scenarios, we have formulated six recommendations (see pp. 34-39 for the extended version):

- ❖ Nurture Tech Literacy & Awareness-Building
- ❖ Invest in Physical & Digital Infrastructure
- ❖ Foster Multi-Stakeholder Collaboration
- ❖ Enhance Geneva's Global Position
- ❖ Address Governance Gaps
- ❖ Prevent Fragmentation as our Worst-Case Scenario

Introduction

Digital technologies play a prominent role in today's interconnected, data-driven world. With the rise of digitalization, the need for digital strategies and a common framework have become an essential component of the international ecosystem. Governments and international organizations have increasingly incorporated digital topics in their action plans to offset the risks and leverage the opportunities presented by technological innovations. For example, states, like Switzerland, have incorporated digital governance into the main pillars of their foreign policy, interconnecting technological innovations with other areas of security, humanitarianism, sustainable development, or economic integration. In the words of Ignazio Cassis, Head of the Federal Department of Foreign Affairs, "Digital technologies are constantly evolving and there is no telling where they will take us next. But one thing is certain: the new technologies shaping our future offer enormous potential to drive sustainable development and prosperity – here in Switzerland and around the world." This quote stems from the Foreword of the Digital Foreign Policy Strategy 2021-24, and points to the growing importance of leveraging the ever changing scope of emerging technologies in common frameworks. Addressing Switzerland's role, and more specifically, that of International Geneva, is the aim of our Applied Research Project and precisely the objective of this report.

Research Objectives

Our research explores and follows the following two research questions:

1. As a host state, how can Switzerland maximize Geneva's potential as a global digital governance hub?

2. How can Geneva enhance a collaborative ecosystem for digital tech governance and governance mechanisms?

The first research question explores the opportunities that Switzerland can leverage to position International Geneva as a leading center for global digital governance. It defines, evaluates and connects relevant concepts of digital governance and assesses the practical applications of hubs as collaborative ecosystems. The second research question, more specific in its direction, examines existing partnerships, initiatives, and frameworks that contribute to Geneva as a digital governance hub. It explores mechanisms and discussions

around digital governance and seeks to answer how Geneva's collaborative digital ecosystem can be further strengthened. Interviews and foresight analysis expand our literature review and identify trends and signals through horizon scanning. These insights help construct future scenarios in order to provide specific recommendations which seek to strengthen Geneva's position as a leader in digital governance.

Literature Review

Digital Governance from Theory to Geneva

Governance can be broadly defined as a structure where values and norms of a given field are defined and executed through more or less formal practices within and between institutions of various kinds (Weiss 2011, 9). Global governance ties together a government-like service within an international system and exists in the absence of a world government, encompassing a wide range of cooperative and problem-solving arrangements. Especially evident with digital governance, the rapid technological advances of the previous century fortified a shared need for interconnected and multi-stakeholder solutions (10). Building on Habermas' theory between decision-making bodies and decentralized public sphere, organized civil societies play an important role in fostering global governance, as they engage in transnational dialogue through a pluralistic social realm (Nanz and Steffek 2004, 321).

Digital governance is an umbrella term encompassing numerous domains of digital technologies. There are multiple specializations within digital governance, such as e-government or digital government, which can be understood as digitalization of governmental affairs, virtual interaction between state and non-state actors, electronic official services, e-identity, and other public services delivered by digital technologies (Gubrium and Holstein 2012; Gibbons 2014; Bannister and Connolly 2012; Lee-Geiller and Lee 2022; Barthwal 2003; Ilves, Hurd, and Schroeder 2020). Examining digital governance through the lens of the Actor-Network Theory (ANT), involves meaningful insight as to how different human and non-human actors interact and influence the process of digital governance, and is aligned with the mentioned effects vs. cause approach (digital) governance follows (31-33).

Internet governance, a subcategory of digital governance, was first addressed at the World Summit on Information Society (WSIS) in 2003 in Geneva. WSIS resulted in the realization of a shared responsibility through governments, the private sector, and civil society in fostering "principles, norms, rules, decision-making procedures, and programmes" that would shape the evolution of the use of the Internet (The UN Working Group on Internet Governance 2005, 4). This resulted in the three fundamental pillars: digital for development, digital trust, and digital rights.

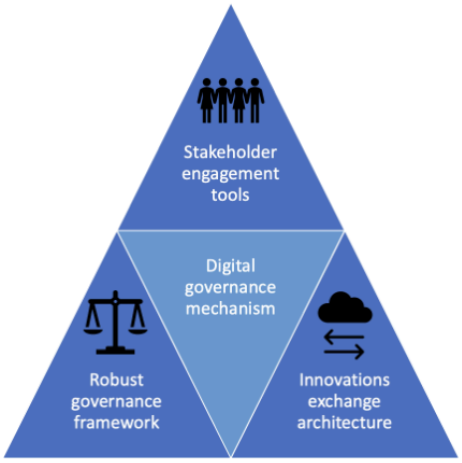

Figure 1 Digital governance mechanism. Inspired and adapted from Gill and Germann (2022, 927).

Hubs play a vital role in governance as a sphere for knowledge generation, exchange, dissemination, and application (Rundel and Salemink 2021, 652). As a collaborative ecosystem, forum, or infrastructure, integrating various institutions, organizations, and actors provide a "multi-level intermediation" of local collaborations and authorities to a national and international context, interlinking different sectors (Ansell and Gash 2018, 16-23). For example, the International Hub for Sustainable Development (HIDS) in Brazil, which encapsulates ecosystem characteristics such as engaging academic, private, civil society, local, state, and finance actors (Dibbern et al. 2023).

L'Esprit de Genève plays an indispensable role in applying concepts of digital governance and hub in Geneva's context. Known as the first international city of the twentieth century,

Geneva can be seen as a place of internationalist ideas, embodied by the many organizations the city hosts (Slim 2007, 109). Looking at Geneva's global reputation for internationalism, Slim (2007) discusses the city's urban branding as a "value-based city, a sort of liberal secular equivalent of Rome, Constantinople, Mecca or Benares", where people come together to shape ideas around peace and global policies, not at last humanitarian aid in the spirit of the Red Cross (109-110). In fact, taking into consideration the fostering of values of internet governance (Kende 2020), the Spirit of Geneva constitutes freedom and human rights and asylum, humanitarian protection and relief against persecution and violence, opposing the spirit of conquest and thus against political oppression and domination (Hieronymi and Intag 2007, 9).

Enhancing Geneva's Digital Governance Ecosystem

As mentioned, digital governance is closely interlinked with Internet governance (Michael Kende 2020). In fact, Kende underscores the lack of collaboration in digital Geneva, identifying it as a primary effort to achieve a global digital governance consensus between the actors constituting the collaborative fabric of the digital ecosystem. Due to its international importance, Geneva could make use of initiatives to fill these gaps, such as the Swiss Digital Initiative (SDI), which was created to fortify collaborative patterns, serving as a solid example of the multisectoral approach evolving in the Swiss digital landscape (FDF 2022). Similar steps have been promoted by FDFA in the *Digital Foreign Policy Strategy 2021-2024* with Geneva in the heart of discussions on digitalization (FDFA 2020). This has led to the promotion of Science diplomacy in digital governance discussions as seen in the foundation Geneva Science and Diplomacy Anticipator (GESDA), a joint effort between FDFA, CERN and UBS (GESDA 2023).

Other examples created by the Swiss government include Platforme Tripartie for digital governance and artificial intelligence to foster collaboration between universities, public authorities, community experts, civil society and private actors (OFCOM 2023). Similarly the Geneva Internet Platform (GIP), now operated by the NGO DiploFoundation focusing on capacity-building (DiploFoundation, n.d.), was created to provide a collaborative framework based on neutrality, digital policy analysis and promote development, fostering projects such as actor mapping and the *Digital Atlas 2.0*.

Kende's report warns that further fragmentation could lead such platforms to other hubs. This resonates with Ittelson and Rauchbauer's study (2023) on emerging hubs offering high economic potential and attracting crucial tech actors for example Bengaluru in India, one of the fastest growing digital economies and potentially the next leading tech innovation and science part attracting foreign investors and diplomatic missions. On the other hand, existing hubs such as Beijing try to become more relevant in digital talks, as argued by Chinese tech giants Alibaba, Tencent, and Huawei (24). The role of the private sector is not to be underestimated. Llorente (2018) and Jeutner (2019) highlight the need for leadership within companies like Microsoft in proposing new frameworks on cybersecurity and other regulations. Contrary to observable trends in other hubs, the FDFA insists on working with existing frameworks and institutions instead of creating new structures (FDFA 2020). There is, however, significant emphasis put on the prominent role of digital innovation hubs in the development of digital governance mechanisms leading to a hybrid or decentralized approach (Sarraipa et al. 2023; Abrahams 2020; Ciuriak and Ptashkina 2020; Flyverbom, Deibert, and Matten 2019).

Thus, Geneva is an active place hosting debates and discussions across various disciplines (Kende 2020). Whether at the UN High-Level Panel on Digital Cooperation (Guterres 2019), or at the upcoming Summit for the Future 2024, digital technologies are of central importance in the building of a new framework with SDGs in mind and drawing on the tripartite approaches already established by the ITU and ILO. Whilst the inclusion of the private sector as a growing actor seems evident (United Nations 2023), the increasingly diverse set of actors and the emergence of many different, independent systems results in a polarized world where each country follows its own framework and rules, as is observable between the United States, China, and the European Union.

Definitions

Digital governance is a leading-edge concept that refers to the development, use and management of digital technologies based on commonly agreed regulations, collaborative actions, ethical principles, and accountability mechanisms. Its main objective is to cultivate trust, ensure safety, improve efficiency and foster inclusivity within digital ecosystems, while promoting innovation.

Further, digital governance encompasses numerous specializations of digital technologies. We explore its components in Figure 2, involving AI, Data, Quantum computing, Internet, Biotechnology, Blockchain, augmented and virtual reality and e-governance. The list is however non-exhaustive and tends to be flexible as new technologies emerge. A wide variety of actors are involved and the collaborative framework spans a wide spectrum of sectors (e.g. Human Rights, Migration, Environment, Health, etc.), resulting in the need for cooperation on numerous domains such as policy and regulations, technologies, education, security, collaboration and economy. Digital infrastructures *per se* are developed mainly by the private sector and are located on states' territories, thus expanding States' sovereignty in cyberspace.

A **digital governance hub** can be defined as an ecosystem, whether physically located, virtual or hybrid, that assumes a leadership role in the governance of digital technologies. Its main objective is to foster multi-stakeholder discussions, establish consensual regulations, promote ethical principles, and deploy reliable accountability mechanisms. Highly adaptable, a digital governance hub should be capable of adopting diverse forms to suit the specific needs of digital technologies.

These definitions originate from our group's collective understanding of digital governance, which we developed through insights gathered from our literature review and our expert interviews. This process added practical value and nuance to our theoretical knowledge and enriched our understanding of the subject. In this sense, the cooperation part, Figure 2, is inspired by Domenico Zipoli's Human Rights Data Revolution (2024) report and interview.

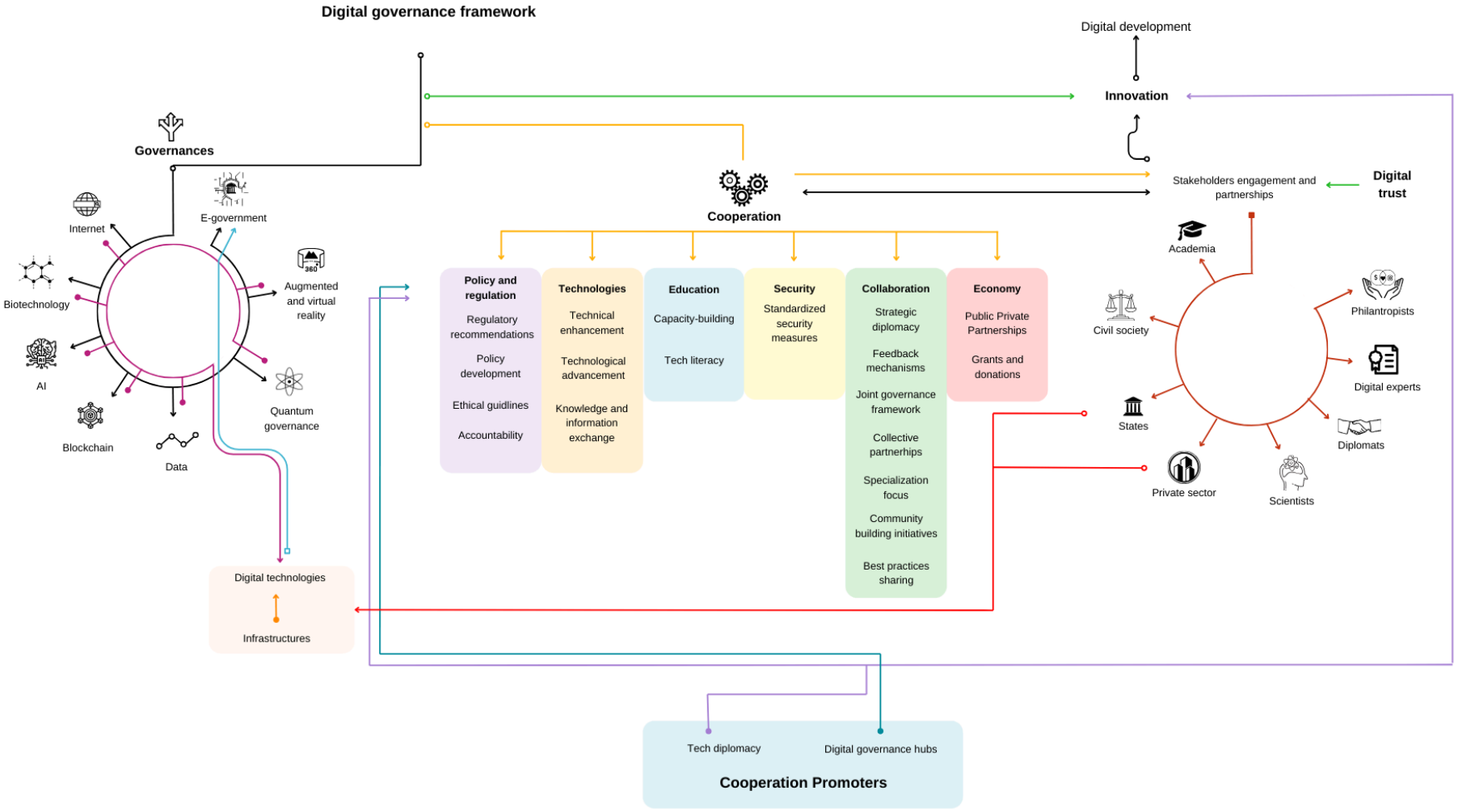

Figure 2 Visualization of digital governance, its main specializations, actors and areas.

Case Studies

In complement to our data from the literature review, expert interviews and foresight analysis, this section seeks to introduce four case studies of governance, two in Geneva and two outside Switzerland. In addition to desk research, interviews were conducted to gain insight into the different specializations. The aim is to showcase other existing models and practices of hubs, some of which could be insightful for Geneva as a hub for global digital governance.

Case Study 1: Human Rights

This case study focuses on the Geneva Human Rights Platform (GHRP) and its digital human rights tracking tools and databases initiative launched in March 2023 at the Geneva Academy. It relies mainly on an interview conducted with Domenico Zipoli in April 2024 and the analysis of his report Human Rights Data Revolution (2024). The primary objective of the initiative is to improve coordination and exchange of shared best practices in using digital tools for human rights, targeted for human rights experts and developers of digital technologies. The GHRP is structured around three key areas:

1. The directory, an online platform exposing existing Digital Human Rights Tracking Tools and Databases (hereafter DHRTTDs) to inform the human rights community of available digital technologies,
2. Publications exploring digital-related subjects, highlighting their challenges and opportunities in the human right sector, and
3. Expert Roundtables, bringing together diverse actors to discuss common practices and solutions, ensuring better coordination and practice-oriented publications.

In his last report, Human Rights Data Revolution (2024), challenges and opportunities related to the use of digital tools in human rights are addressed, focusing on accessibility, sustainability and interoperability or cooperation of DHRTTDs. Challenges mentioned include data inconsistency, technical disparities, resource limitation, and as well as privacy concerns among others. Domenico Zipoli emphasized the need for guardrails to ensure inclusivity and efficiency of these tools and proposes a governance framework comprising policy and regulation, technological innovations, and partnerships building.

The report's findings and solutions originate from two expert roundtables held in 2022 and 2023 in collaboration with the UN High Commissioner for Human Rights (OHCHR), involving actors from the technology sector human rights practitioners from international organizations (UN), states representations in Geneva, national mechanisms for implementation, reporting and follow-up (NMIRFs), national human rights institutions (NHRIs), NGOs and academia. What is important to see in this initiative is that it conveys a rich and interesting collaborative framework that proves to be successful in collective thinking aiming at finding common solutions to the usage of digital tools, highlighted in the report, in response to global and common challenges that technology may induce. In this sense, Switzerland can be seen as a crucial neutral platform facilitating discussions and decreasing competition. In addition, the academic sector is highlighted to have a central role in promoting and facilitating collaboration on digital technologies due to its scientific background and its mechanisms for preventing bias.

The case study reveals the evolving governance framework within the Human Rights domain, demonstrating the effectiveness of specialized initiatives, practice-oriented and crucial for a broader governance framework. Domenico Zipoli highlights the necessity to ensure that general elements across sectors are discussed at the international level. However, he advocates for maintaining a sectoral governance framework adapted to address human rights concerns, emphasizing the need to preserve the silo approach in a positive manner. Smaller initiatives prove to be more practical and concrete, enabling us to propose more action-oriented recommendations and adapt the specialized governance framework from a bottom-up perspective.

Case Study 2: Global Health

Geneva as a hub for global health governance traces back to the city's history. After the Second World War, many parts of the world, especially in Europe, lay in ruins, to which world leaders agreed to convene a conference that should lead to the creation of an institution that would connect regional and international health organizations to collaborate around common objectives. This led to the establishment of the World Health Organization (WHO), whose headquarters was agreed to be located in Geneva due to the historical prominence of the League of Nations' Health Organization. Brock Chisholm, one of the founders and the first Director General of WHO, established a structure, linking the headquarters to regional

and country offices within one single institution (Lee 2008, 12-27). Ever since, Geneva's 100+ years of global health discussions has attracted many health-related actors around the lac léman.

In conversation with the Global Health Centre in April 2024, we discussed how Geneva's global health governance is based around the WHO, which functions as the center of gravity in global health discussions. As a result, the more international health players moved to Geneva, the more Geneva became a hub for global health. Geneva's health ecosystem is documented as shown in Figure 3 which maps Geneva's global health actors from academia, NGOs, partnerships, and UN-offices.

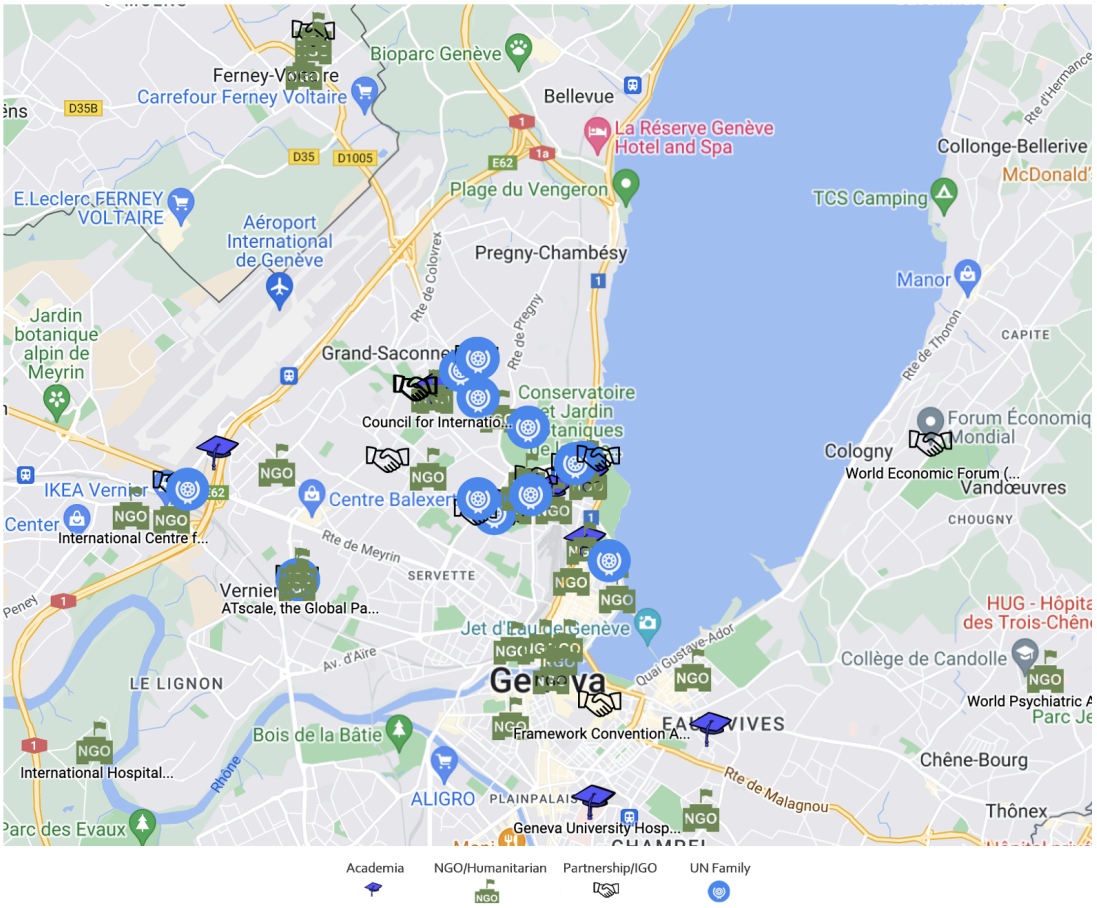

Figure 3 Map of Health Organizations and Collaborations in International Geneva (Global Health Centre, n.d.).

Some examples include Medecins Sans Frontieres (MSF), Enfants du Monde (EdM), Food and Agriculture Organization of the United Nations's (FAO) regional office, the International Committee of the Red Cross (ICRC), Save the Children, and many others. Whilst WHO connects different actors together through their mandate, it also functions as an authority

body, which includes tasks such as setting norms and policies, as seen during the Covid-19 pandemic. In addition, Geneva hosts multiple events and initiatives, such as the annual health assembly, a week-long series of policy-making processes, to which governments send their attachés to discuss global health advancements.

A key difference between Geneva as a hub for global health governance versus as a hub for global digital governance is the presence of a dominant organization, such as the WHO, that functions as a decision-making body. In this sense, a takeaway from Geneva's global health governance could be the creation of a decision-making body equivalent to the WHO for global digital governance.

Case Study 3: San Francisco

The San Francisco Bay Area has been one of the leading innovation hubs around the world, concentrating large tech firms, startups, venture capital funds, and universities. The increasing capitalization, geopolitical leverage, and societal impacts of Big Tech influenced state actors to engage with private stakeholders. Tech firms operate as net states, organizations with an immense global and cross-sectoral reach, shaping agenda-setting, policy formulation, implementation, and cyber infrastructure (Khanal, Zhang, and Taeihagh 2024, 12).

Denmark spearheaded tech diplomacy in the Bay Area in 2017, prioritizing digitalization in its foreign policy framework and appointing a tech ambassador to bridge "the diplomatic deficit in the old structures of international relations" (Klynge, Ekman, and Waedegaard 2020, 187). Other countries soon followed, boosting the practice of tech diplomacy. For example, the EU opened a new office to promote its "human-centric vision of the Internet and digital technologies" (European Union External Action 2022), France, South Korea, and Brazil to strengthen technology and science partnerships, and Canada to advance online privacy and data protection (Ittelson and Rauchbauer 2023, 18-22). Switzerland has been hosting Digital Dilemmas Salon series with the ICRC and Swissnex, highlighting impacts of technology on civilians during armed conflicts (Swissnex 2023).

The tech diplomacy includes formal and informal networking events, fostering closer ties between tech experts and attaches, such as Denmark-Australia Cyber and Tech Retreat,

multi-country Freedom Online Coalition, Austria's Tech Diplomacy Initiative, or joint-NGO Technology Diplomacy Network (Ittelson and Rauchbauer 2023). Moreover, more frequent engagement between policymakers and tech experts can strengthen technical cooperation and adaptation of digital standards, frameworks, and regulations (World Economic Forum 2022).

Generative AI revived the San Francisco Bay Area, stimulating investments and new start-ups after a period of significant job cuts at Big Tech firms such as Amazon, Google Microsoft, Meta, or X (Vynck 2023). The rise of and advancements of Large Language Models (LLM) made a breakthrough in practical applications of AI, notably with the release of OpenAI's ChatGPT or Google's Bard. As of 2023, there are 2101 AI scale up projects, 17% of which are generative AI, amounting to $143.7 billion of raised capital (Marinucci and Onetti 2023, 10).

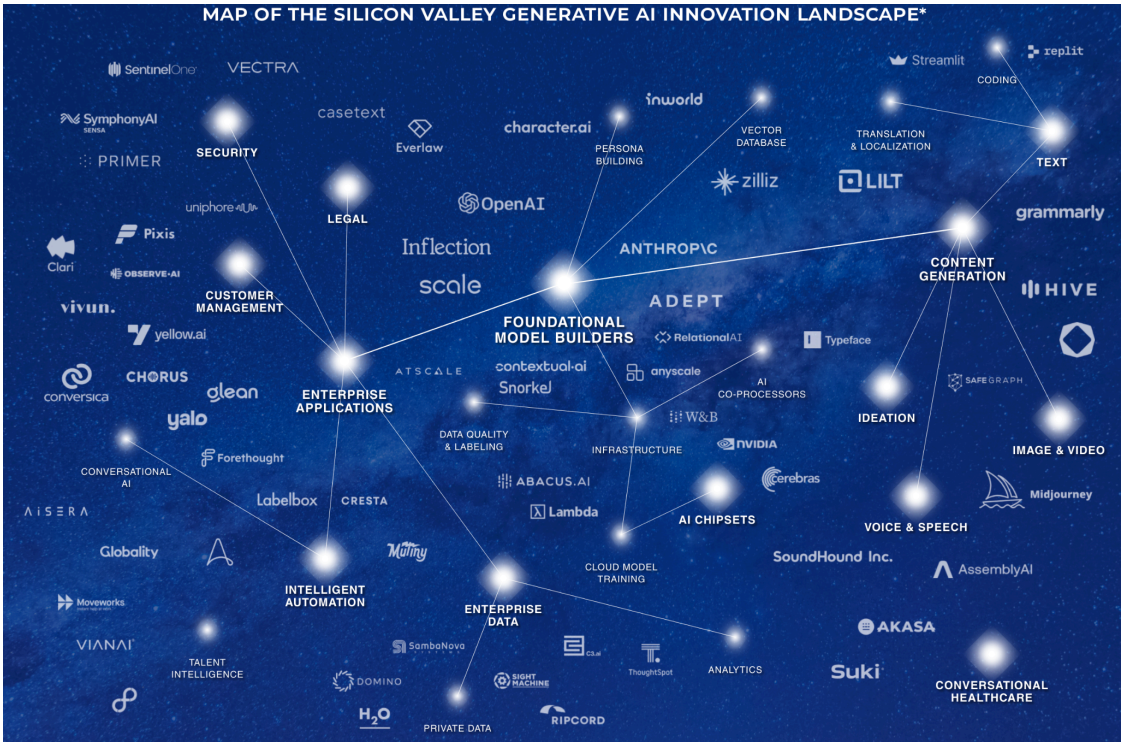

Figure 4 Map of the Silicon Valley Generative AI Innovation Landscape (Marinucci and Onetti 2023, 17-18).

Several interviewees highlighted lack of representation of Global South, in terms of tech firms and civil society groups, in the Bay Area. The absence presents vulnerabilities and ramifications on equitable development of digital technologies, especially in the development of LLMs, which can promote Western norms and values, leaving out Global South voice. The

silicon doctrine, “move fast and break things” (Taplin 2017), often perceived as an accelerator for tech innovation and competitive advantage, is not necessarily transferable to other contexts. The high cash injection and failure rate may create new breakthroughs, however, investors’ risk tolerance varies by regions. Applying these findings to the context of Geneva, heightened and targeted investment in emerging technologies through start-ups and academic centers could imitate Silicon Valley’s incubating ecosystem.

Case Study 4: China

As an active participant in global governance and one of the main driving forces behind global digital development, China has been committed to contributing to global digital governance. While China still lags behind developed countries in terms of digital technology and rule-making capacity, the digital divide and the limitations under the Western system of global governance provided opportunities for China.

China is trying to lead and contribute to the different initiatives and other major achievements in global digital governance (Kai and Zhihan 2022). At the G20 Summit held in Hangzhou in 2016, China took the lead in proposing the G20 Digital Economy Development and Cooperation Initiative. President Xi Jinping sent a congratulatory letter to the Wuzhen Summit of the World Internet Conference 2022, emphasizing that China is willing to work with countries around the world to blaze a global digital development path that features joint building and sharing of digital resources, vibrant digital economy, efficient digital governance, effectively guaranteed digital security, and mutually beneficial digital cooperation (The State Council of the People’s Republic of China 2022). In 2023, China submitted to the United Nations China's Position on Relevant Issues of Global Digital Governance on the Global Digital Compact, proposing the principles of international digital governance, such as adhering to solidarity and cooperation, and fostering fairness and justice (Ministry of Foreign Affairs the People’s Republic of China 2023). The initiative aims to expand cooperation in the field of the digital economy and unleash the enormous potential of the digital economy in the implementation of the United Nations 2030 Agenda for Sustainable Development. To create regional digital cooperation frameworks and strive to bridge the digital development gap, China released the Beijing Initiative for International Cooperation on the Belt and Road Digital Economy in 2023.

China's attention to global digital governance has been mainly focused on the topic of global digital economic governance. In comparison to Switzerland, China seems to prioritize global digital governance within existing global governance frameworks and regional collaborations rather than reinforcing its desire to become a hub for global digital governance. China is now seeking to take the lead in existing cooperation platforms and regional cooperation or to build new initiatives to establish the common goals and values of countries around the world on global digital governance issues. In contrast to Switzerland's current strategy, China is decentralizing the goal of global digital governance within the country, by leveraging the strengths of different cities to maximize the benefits of China's participation in global digital governance. This strategy also serves to increase Chinese city's participation, thus allowing China, as a whole, to gain more of a voice in global digital governance. Obviously, global digital economic governance is a strategic first step for China to participate in global digital governance.

Methodology

Our research project utilizes two methods: semi-structured interviews and foresight analysis. The interviews bridge our literature review gaps and expand our understanding of digital governance. The foresight analysis relies on interviews for identifying signals and trends, and for developing future scenarios of International Geneva. The forecasting exercise contextualizes our recommendations for strengthening Geneva’s digital governance hub and elevating its international leadership.

Interviews

We deploy a series of semi-structured interviews tailored to professionals and high-level officials to explore the current digital technology landscape and governance developments in Geneva. These serve to fill the gaps found in our literature review as well as to complement our second method of foresight analysis, and by providing policy insights and recent developments. High-level officials possess valuable knowledge, which might not be codified in literature, and which is essential for understanding the full picture of the researched subject and contextualizing forecasting exercises (Mosley 2013). In sum, the method of interviews follows four main objectives to answer our research questions:

1. Acquire a better understanding of the current landscape of digital governance in Geneva and beyond,

2. Envision future scenarios of International Geneva,
3. Identify opportunities to enhance Geneva's collaborative ecosystem,
4. Develop strategies to strengthen Geneva's international leadership in digital governance.

Research Design

Our interviewee selection processes are convenience and snowball sampling. We started off with contacts provided by our project partner. This includes experts from the Federal Department of Foreign Affairs, the Federal Statistical Office, the UN University, and the DiploFoundation. We complemented our sample list with referrals from the interviewees and additional desk research. Overall, this mixed selection process represented 18 individuals from the public, private, and academic sectors located primarily in Switzerland, including four interviewees from other hubs, such as San Francisco and Guangzhou. Figure 5 visualizes the different sectors interviewed.

Data Collection & Analysis

The interviews were conducted primarily in-person and deployed online tools for more accessibility. Our method implied using a universal interview grid with thematic questions adapted for each interviewee. Divided into three parts, each with around three to five questions, the themes ranged from the definition of digital governance to individualized questions on the interviewees' area of expertise (e.g. data governance in the interview grid for the Federal Office for Statistics, or the private-public ecosystem in the interview grid for Google), to foresight questions. The interviews were conducted by at least two team members for the respective roles of leading the interview and notetaking. To assure a detailed transcript, and in accordance with our ethical framework, the interviewees' consent were systematically taken orally for audio recording and their anonymity for the final report guaranteed if expressly asked. Following Bazeley's (2009) three-step method, we described, compared, and related results to identify categories and themes. We then summarized and visualized each interview, and compared the outputs from all discussions. A more detailed summary of each interview can be found in the appendix (see pp. 45-48). In the upcoming part are described the major takeaways per field of expertise.

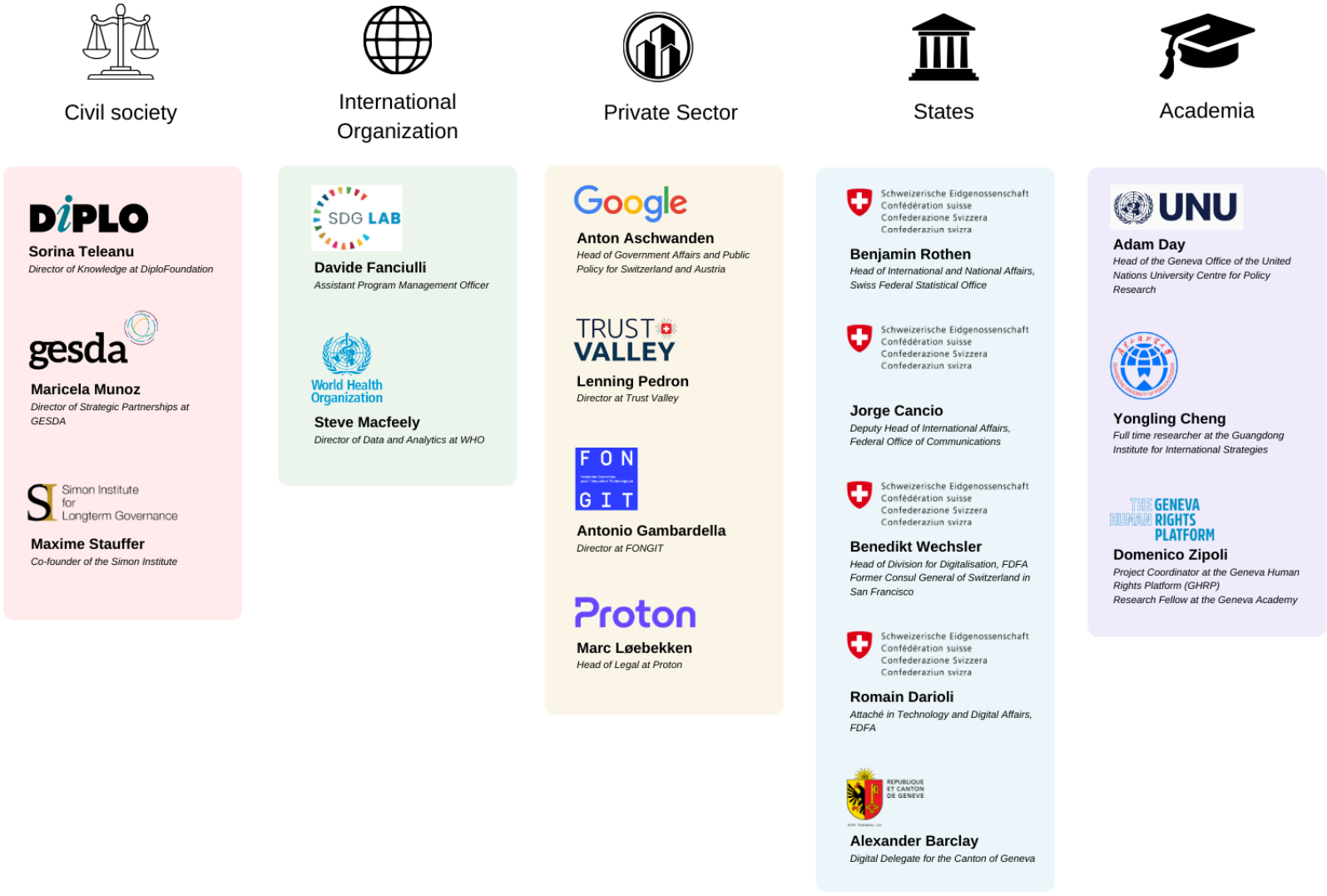

Figure 5 Visualization of interviewees by sector.

Findings

International Organizations & Civil Society

Interviews with DiploFoundation, WHO's Data Division, GESDA, and SDG Lab highlighted several interlinkages and overlapping themes. First, all interviewees agree on the complex and multifaceted nature of digital governance due to geopolitical tensions, different interests in regards to resource disparities as well as a visible lack of common frameworks. The interviews confirmed the already mentioned lack of common frameworks and the difficulty of agreeing on rules and regulations that encompass and involve all stakeholders. As pointed out by WHO's Data and Analytics office, there are three dominant models: the individual-centric European, the state-centric Asian, and the company-centric American model. Thus, digital governance requires an urgent need for cross-cultural collaboration in order to avoid any monopolization, for example that of big tech companies such as OpenAI, Google, Microsoft, Meta, and X, who currently dominate resources relevant for the governance of digital technologies. Whilst Geneva offers promising ground for such leading initiatives to take place, it faces issues in cross-sectoral collaboration leading to an imparity between macro- vs. micro-level discussions on the ground. The interviewees all state the dire need for new initiatives to break the silos and connect the dots, highlighting the need for resolutions and guiding principles to ensure responsible governance.

Private Sector

Several key themes emerged from our conversations with private sector stakeholders such as Google, Trust Valley, Fongit and Proton. For one, there is a growing need for a correct assessment of opportunities and challenges that emerge with emerging technologies such as artificial intelligence. Thus, collaboration as well as education are highlighted as essential in this regard, especially in ensuring tech literacy among decision- and policy-makers and bridging the gaps between the private and the public sectors. Equally important for the establishment of digital frameworks is the insurance of responsible, ethical and secure use and governance of technology. These include data privacy, cybersecurity, as well as digital rights, and requires the coming together of all stakeholders. Although the limits of Geneva's landscape marks a difficulty to incorporate all aspects of a global hub for digital governance, for example by imitating Silicon Valley's endeavors around the Lac Leman as pointed by Fongit and Proton, the interviewees from the private sector seem to agree that whilst Geneva

has all components to form its leadership in digital governance, it lacks successful involvement of the various parts. Other than an unattractive tax system, as mentioned by Proton, Geneva requires a proactive state-led push for initiatives linking stakeholders into a common direction and establishing clear guidelines and mechanisms, as well as taking into account other hubs with strong innovation mechanisms such as Israel, Singapore, Hong Kong or Berlin, as argued by our interviewees from Trust Valley and Google.

State

We have conducted interviews with various Swiss state actors such as the Federal Statistical Office in Neuchâtel, the Federal Office of Communications in Biel/Bienne, the FDFA Division for Digitalisation, the FDFA's Attaché in Technology and Digital Affairs, as well as the Digital Delegate for the Canton of Geneva. The conversations with state actors reveal several key aspects regarding data governance and digitalization. On the one hand, it was highlighted that data governance requires and involves technical, legal as well as institutional elements with a growing importance of the private sector. Whilst all Swiss state actors recognise the importance of policy making, existing regulations and power dynamics involved pose a difficulty. Collaboration is seen as an essential step in data governance and in mitigating cybersecurity threats which requires the involvement of the private sector. Another important element to Swiss state actors is tech diplomacy, which also involves tech companies and researchers, through which the Swiss government participates in international discussions around digital technologies, including notions of autonomy and democracy. Thus, geopolitics too becomes an important element of consideration when investing in a global digital tech hub. However, they specifically acknowledge the lack of the global south's representation in the ongoing discussions.

Academia

Given the growing importance of academia as a cooperation enabler in digital governance discussions, we have conducted three interviews with professionals from the United Nations University, the Geneva Academy centered on a sectoral approach, and Guangdong Institute for International Strategies in China to incorporate another perspective. The main takeaway from these interviews revolves around the importance of adopting a multidisciplinary approach regarding the use of digital technologies. Interviewees highlighted the lack of involvement from big tech companies and the challenge to find a common playground between main actors of digital governance. There is currently a sharp decline in consensus,

information exchange and discussions. However, from a sectoral or silo point of view, we can see a marked improvement in collaboration between developers and users of digital technology software and hardware, enabling fruitful discussions on the use and best practices associated with digital technologies. In the future, our interviewees foresee a rise of inequalities and competition involving the monopolization of the digital sphere as well as a growing decentralized approach to digital governance.

Limitations

As we saw in our definition of digital governance, the wide range of sectors, players, technological specializations and areas of cooperation makes digital governance a vast subject by nature, posing challenges to incorporate all elements in depth. Given the broadness of the topic, and as well due to our non-tech backgrounds, it was challenging at the beginning to narrow down the questions in order to still get some specific answer, especially with our time constraint of one hour per interview.

Another limitation was the accessibility of experts. Additionally, we observed diverse time-related limitations linked to conflicting time constraints and work schedules, rendering the anticipation of expert availability uncertain. Further, we encountered difficulties to reach certain experts, especially if they were not in Switzerland or Geneva. However, thanks to the recognition of our partner organization and our faculty lead, most of their recommended experts generously offered a time-slot for interviews.

A last limitation touches on the representativity and diversity or the experts interviewed. Whether diversity of sectors or nationalities, we had ideally planned to include a more diverse set of interviewees. Reasons for scarcity could be various forms of biases, such as selection or attention bias, inefficient networking, or mismanaged time. This could lead to a skewed and incomplete outlook. Whilst complete inclusion could not be guaranteed, we tried to preempt any lack of diversity by taking contrary actions, such as interviewing experts from different professional and national backgrounds, beyond Geneva and Switzerland.

Foresight Analysis

Foresight analysis is an adaptive and participatory process that diagnoses past and present dynamics, builds scenarios, and ideates strategies to achieve desired futures (Krishnan et al.

2022). Foresight begins with driver mapping and horizon scanning to understand recent dynamics. The first component analyzes drivers, underlying forces of change, commonly through a STEEPV framework[1] (Miles, Saritas, and Sokolov 2016, 50). The latter scans for signals and indicators to identify opportunities, risks, and uncertainties. The ultimate goal is to provide a broad range of scenarios of varying complexity and uncertainty represented in Figure 6.

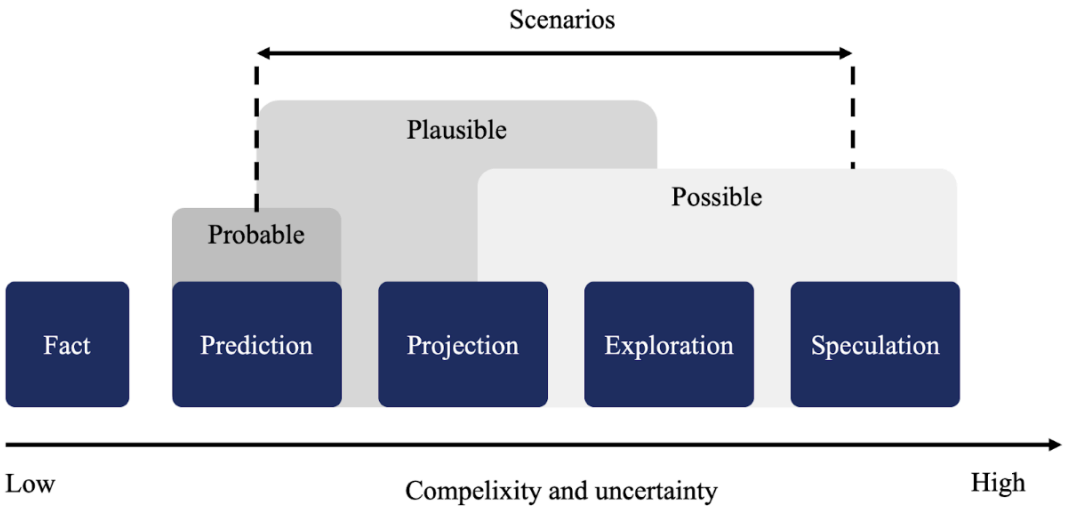

Figure 6 Levels of uncertainty and complexity in foresight scenarios, adapted from Wiebe et al. (2018, 547).

Foresight reports integrate a series of multi-stakeholder sessions throughout the process to generate more representative future scenarios. For example, EU sustainability foresight hosted two workshops for scenario validation and design of strategic interventions to complement its research and analysis (Matti et al. 2023, 17). This is vital for an open-ended process like foresight to create multidisciplinary perspectives. Surveys and interviews complement quantitative and qualitative research components to contextualize trends and drivers (Miles, Saritas, and Sokolov 2016).

Furthermore, indices can provide valuable metrics for both future scenarios and implementation strategies. Foresight analysis of the agricultural sector in Spain, for example, contextualized four scenarios (baseline, liberal market, regional sustainability, and international sustainability), with estimates of prices, yields, subsidies, chemical inputs, and

[1] STEEPV stands for different categories, such as social, technological, economical, ecological, political, and values.

ecological constraints, to assess the dynamics of the alternative futures (Gomez-Echeverri 2018). Data and text mining can help identify signals and determine the saliency of trends. Another example, a joint UNDP and MBRF report on the future of knowledge utilized alternative metrics, such as social media channels, to determine the popularity, engagement levels, and sentiment towards a given topic (UNDP RBAS and MBRF 2018).

Implementation of Foresight Analysis

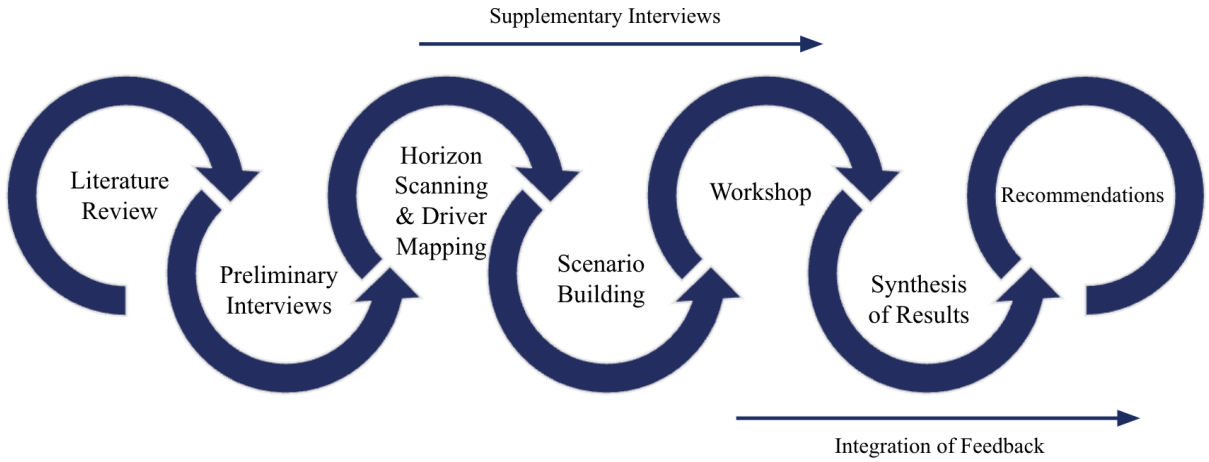

Figure 7 Step-by-step visualization from literature to foresight analysis.

Our foresight methodology follows a multi-stage approach, represented in figure 7. In the first stage, we consulted secondary signal reports produced by governments, IOs, NGOs, and private companies and academic literature on the topic as a preparation for our interview phase relevant for the horizon-scanning and driver-mapping steps (UNDP RBAS and MBRF 2018; Dufva and Rowley 2022; Deloitte Consulting GmbH 2017; UK Government Office for Science 2021; GESDA 2023). In the second stage, we highlighted and visualized observed trends, (weak) signals, shocks, and disruptors to understand linkages and patterns with interactive maps on Miro (see figure 8). In the third stage, we adapted Dator's (2009) Four Future Futures framework and Johansen's (2018) morphological analysis to create alternative visions with a medium probability of occurrence, based on the horizon mapping gathered from the literature review and the conducted interviews. We utilized AI throughout the scenario-building process to seek inspiration and compare preliminary visions. Although we found it useful to visualize a different perspective, we excluded its recommendations due to unsatisfactory and superficial results.

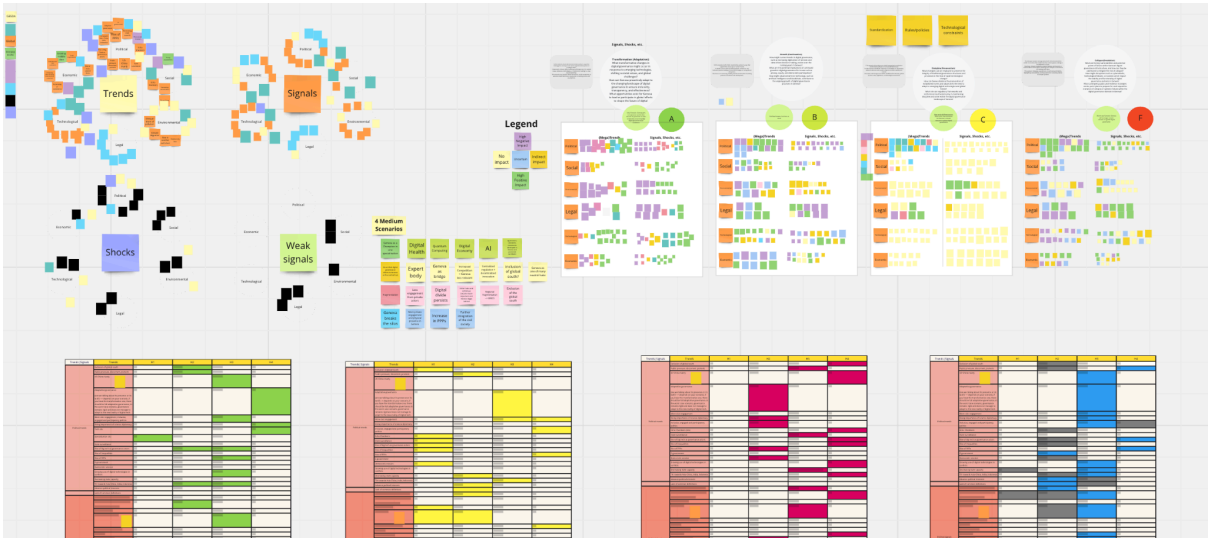

Figure 8 Driver mapping, horizon-scanning, and scenario building in Miro

Moreover, adding a participatory approach, we hosted an interactive workshop with various stakeholders, depicted in figure 9, in which we showcased our preliminary findings and tested our scenarios through an interactive session in small groups and an open discussion to broaden our vision of the present and future as well as map out similarities, differences, and missing links. We then refined our scenarios and utilized backcasting techniques, evaluating how favorable visions can be achieved and less favorable ones can be minimized step by step as a prerequisite of the preliminary recommendations. The insights and feedback also visualized policy gaps between our literature review and case studies, and diversified our synthesis of results.

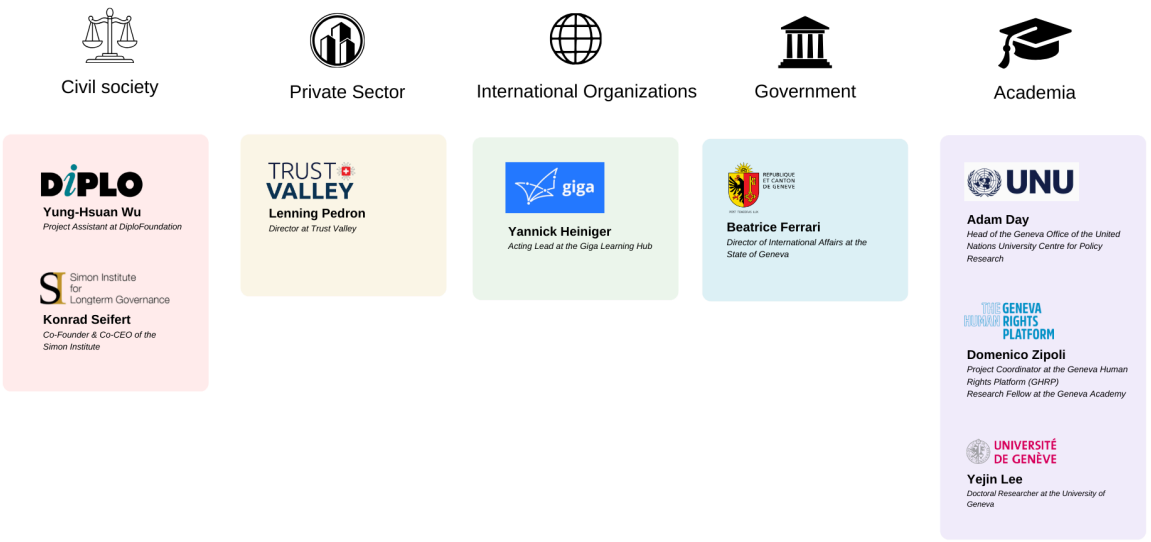

Figure 9 Foresight workshop participants.

Foresight Scenarios

The tables below provide a brief overview of our four scenarios, describing key dynamics, trends, and signals. The first scenario highlights a vision of International Geneva as a governance innovator and leader in one sector/specialization, the second as a central hub for governance discussions and instruments linking regional hubs, the third offers a fragmented world led by alternative, BRICS+ multilateral structures, and the fourth a win-win opportunity for cross-sectoral partnerships and a collaborative ecosystem. Potential shocks provide an additional layer of uncertainty, highlighting highly disruptive events that can occur in any scenario at any given time.

Scenario 1: Specialization Geneva coordinates global AI governance discussions and frameworks
International Geneva innovates and promotes new norms, frameworks, and standards, coordinating global AI governance. The existing ecosystem of IOs and NGOs increases cross-sectoral partnerships and heightens adaptive governance mechanisms with intensified participatory and transparency components. The increasing automation and digitalization of private, academic, and professional spaces generate new data and spark more discussions on job loss. Present challenges persist, such as missing the physical presence of

private actors, the widening gap between policy implementation and technological progress, varying geopolitical perspectives on the ethical use of AI, and lacking tech literacy of policymakers.	
Key trends	Key signals
● Medium-high increase in PPPs ● High adaptive governance ● Medium-high civic engagement ● High specialization silo ● Rise in national digital governance regulations ● Highly concentrated digital governance hubs ● High AI ethics	● Medium-low public interest gap ● High digital sovereignty ● A rise in digital initiatives ● Increased tech literacy of policymakers & cross-sectoral collaboration ● Low regulatory competition ● High disruption by generative AI ● High data monetization ● High enforcement challenges

Scenario 2: Decentralization Geneva links existing and emerging international hubs	
Geneva remains an important player in global digital governance discussions instead of becoming a hub for global digital governance par excellence. Instead of taking a leading role, International Geneva serves as a link to bridge existing and emerging international hubs. The city's renowned diplomatic and neutral character continues to draw representatives from governments, multinational corporations, and civil society organizations to engage in dialogue and cooperation on digital governance, ranging from quantum computing, cybersecurity, digital health, to AI governance. Technological innovation occurs outside of Geneva as regional hubs attract more private engagement and infrastructural investment.	
Key trends	Key signals
● High increase in PPPs ● Medium-high adaptive governance ● Medium-high tilt towards Asia ● Medium-high rise in national digital governance regulations ● Medium-low concentrated digital governance hubs ● High decentralized technological innovation ● High ethical standards	● Medium-high digital sovereignty ● Medium-high rise in digital initiatives ● Medium-low fragmentation and regulatory competition ● Medium-high disruption by generative AI, metaverse, blockchain, VR ● Medium data monetization

Scenario 3: Fragmentation BRICS+ revolutionizes multilateralism and diminishes the role of International Geneva	
The traditional multilateral system experiences a radical shift. BRICS+ challenges the status quo by setting up alternative structures and institutions. International Geneva loses its long-standing leadership and prominence as geopolitical tensions increase and discussion fragments. Investments, innovations, and conferences take place in new hubs, mostly in the Asia Pacific, new dominant digital markets. Private actors join the wave and relocate to new centers of technological and governance innovation. Consequently, multilateralism faces an immense challenge of radical transformation or relocation along with eroding public trust and the democratic world, and worsening the climate crisis.	
Key trends	Key signals
● High exclusion of the south ● Low adaptive governance ● Big tech as powerful governance entrepreneurs ● High inequalities ● High tilt towards Asia ● High rise of national regulations and competition ● High decentralized technological innovation ● Medium-high advancement of technologies ● High trade fragmentation	● High public interest gap ● High digital sovereignty ● High policy formulation and implementation gap ● Medium-high increase internet coverage ● High inadequacy of the current global governance system ● High disruptive Metaverse, generative AI, state investment in tech R&D ● High data monetization

Scenario 4: Collaboration International Geneva breaks the ‘silos’ and champions in PPPs
Geneva emerges as a central hub for global collaboration and innovation in digital governance. Public-private partnerships flourish, tech literacy among policymakers increases, and collaboration between tech experts and legislators breaks the silos. New mechanisms, tools, and collaborative spaces further integrate private and civil society actors, stimulating cross-sectoral innovation and harnessing the science diplomacy potential of International Geneva. Tech companies follow suit of Microsoft, establishing public diplomacy representatives, heightening their physical presence in all-year-round governance discussions, and increasing their investments and projects across Switzerland.

Key trends	Key signals
• Medium-low exclusion of global south • Medium-high adaptive governance • High increase in PPPs • High rise of big tech as governance actors • Medium-high tech literacy of stakeholders • Medium-high innovation for societal changes • Medium-high advancement of technologies	• Low public interest gap • Medium-high digital sovereignty • Medium-high scrutiny over big tech • Medium-low political fragmentation • Medium-low policy formulation and implementation gap • Medium-low regulatory competition

Potential shocks for all scenarios
• Elections in influential and strategic states • Data breach leading to total loss of trust • Large-scale cyber attacks on critical infrastructure • Energy and Internet blackouts • Climate overshoot • UN collapse or relocation • Financial crisis • WW3

Foresight Workshop

Workshop participants presented their perspectives around our scenarios and the corresponding trends and signals, either based on their own fields of study or the organizations they work for. Our four scenarios reflect the challenges, established strengths and future opportunities that Geneva will face, based on findings from our literature review and interview sections. Taking into account the conclusion from our workshop, Geneva is currently not a global leader in key elements of global digital governance, such as the representation of stakeholders and the private sector participation. However, Geneva can capitalize on the established global governance ecosystem and promote cooperation to enable more stakeholders to participate in global digital governance. By strengthening cooperation with key countries and leveraging Switzerland's high-tech resources, Geneva has the potential to bridge global divides and become a hub for global digital governance in the future.

Scenario 1: Specialization

We find that Geneva is still underrepresented in global digital governance and may also be struggling to attract global resources for science and technology. The former is mainly reflected in the lack of representation from the Global South within Western-dominated civil society organizations. The latter could result in a lack of private sector participation in Geneva-centered governance due to the scarcity of resources for technology and talent, which in turn could affect Geneva's role as an intermediary between the world. Geneva's position as a leader in a single area, such as digital health, was equally challenged, mainly because other countries were trying to collect more data and were actively developing norms.

Scenario 2: Decentralization

This scenario was identified as the closest to reality. Geneva's strength lies in its international public policies and Geneva's role as a bridge for governance discussions is acknowledged, although it's not considered an ideal hub solely for technological advancement. It’s worth noticing that the potential decentralization of the UN might lead to increased friction among different hubs but may also provide more incentives for investment. Further, participants’ feedback from the workshop considered a combined mix of the second and fourth scenarios ‘decentralization & collaboration’ as the most plausible future outcome.

Scenario 3: Fragmentation

This is the most pessimistic scenario in terms of our research question, and according to the participants’ feedback, the least likely to happen. Even though other countries may be interested in forming leading hubs, they lack the robust governance structure of International Geneva and its organization, which is critical to addressing the challenges of global digital governance. However, there is a potential concern that the world could further polarize between the United States and China, and which could further escalate to the brink of World War III, leading to a large-scale fragmentation of the global landscape.

Scenario 4: Collaboration

There was a critical view that the current pace of crisis management in Geneva lacks efficiency to resolve conflicts of interest quickly and effectively. Thus, Geneva remains unattractive to the private sector. Emerging technologies, like quantum computing, will play a crucial role in shaping the future landscape and the monetization of digital technology cannot

be achieved without collaboration between government and the private sector. Moreover, the tension between norm-setting, characterized by slow processes such as treaty negotiations, and converging power, facilitated by soft law mechanisms like forums, remains a key dynamic in shaping global governance.

A Possible Fifth Scenario

The scenarios we provided are not all the possibilities for the future, so in the open discussion of the workshop, the participants were asked to share their vision of a fifth scenario. Other than a combination of second and fourth scenarios, following insights were shared. Focusing on AI, a fifth scenario views Geneva having the potential to establish verification infrastructure for AI hardware, enabling a deeper understanding of its functions and increasing control over its operations. While the idea of CERN for AI seems unlikely, Geneva's reputation could position it as a leader in monitoring mechanisms. Despite concerns about job loss, the efficiency gained from AI could lead to positive outcomes, enhancing operational efficiency.

Trends and Signals

While we didn't have enough time to discuss trends and signals in every scenario, we tried to capture missing trends or signals from the discussions. It is true that the growing importance of social media, for example, was not included in our discussion like Tiktok, Facebook which are highly influential social media platforms. The impact of this on the future of global digital governance is as incalculable as the initial disillusionment of everyone at the time of the birth of these platforms.

Overall, Geneva faces several challenges in its pursuit of becoming a hub for global digital governance. These challenges include the exclusion of the Global South due to Western or European dominance, coupled with a lack of private sector engagement. The funding shortages and the decentralized nature of technology reflect the unattractive state of affairs in Geneva for the private sector, which might present significant hurdles in the future. However, amidst these challenges also lie numerous opportunities. Geneva can leverage its position to foster tech for good initiatives and promote science diplomacy, for example by strengthening cooperation with the United States, China and BRICS countries. Its established ecosystem, including various secretariats and dialogue spaces, offers potential for collaboration and bridging global divides. While fragmentation poses risks, it could also offer opportunities for

more equitable representation. Participants also raised that Zurich's high-tech human resources and existing financial infrastructure could complement Geneva's ecosystem.

Limitations

Our research project adapts foresight, integrating its general objectives and frameworks; however, it narrows down the scope of the method due to the time constraints of our project. The first phase of horizon scanning and driver mapping excludes an important component of the quantitative analysis of indices. Our main reliance on literature research and interviews can leave out key trends and weak signals, which can have an effect on future perspectives. That is why we integrate trends and signals identified by a variety of actors to extend the range of possible scenarios. Selection bias of workshop participants can occur and impact our findings, providing skewed horizons of Geneva's digital governance hub. For this reason, we attempted to diversify our workshop participants, carefully selecting stakeholders from different sectors to minimize knowledge and policy gaps. Equally challenging was the initial difficulty in connecting with foresight as a rather new and developing method, unfamiliar to us prior to this research project. Fortunately, our faculty lead provided us with insightful tools to customize ourselves with the methodology in due time.

Synthesis of Findings & Recommendations

Synthesizing our findings from the literature review, case studies, expert interviews, and foresight analysis, we identified several actionable policy recommendations. The first set of themes underscores initiatives and steps to obtain a desirable future, interconnecting foresight scenario 2 (decentralization: Geneva linking existing and emerging international hubs) and scenario 4 (collaboration: Geneva champions public-private partnerships). We utilized a backcasting technique crafting short- to medium-term recommendations, striving for the long-term ideal outcome. The last component considers the worst-case scenario of total fragmentation, erosion of Geneva's international ecosystem and traditional multilateral structures.

Nurturing Tech Literacy & Awareness-Building

- Strengthen tech literacy of current policymakers and diplomats through specialized programs, workshops, and collaboration with tech experts

- ❖ Prepare the next generation of policymakers through an upscaled tech-centered education system for future digital challenges and opportunities
- ❖ Establish an independent, scientific-led information center for global awareness building on key tech issues, developments, and applications

Geneva could lead tech literacy and awareness-building programs to strengthen digital skills of current policymakers, prepare the next generation for future issues, and disseminate expert knowledge on the latest digital risks and developments. Firstly, Geneva can bridge the knowledge gap, building upon and strengthening existing initiatives, such as DiploFoundation, to promote a more comprehensive understanding of cutting-edge technologies of decision makers and foster closer ties with the tech sector, utilizing platforms such as Trust Valley. Secondly, it equips future policy experts and diplomats with future skills, adapting to rapidly changing dynamics by offering tech-centered education programs across all levels. Moreover, harnessing Geneva, Lausanne, and Zürich academic, financial, and technological ecosystems for new innovation parks and partnerships through frequent and consistent events and projects would be essential to apply tech literacy in practice. This approach would allow digital Geneva to leverage the knowledge of young policy-makers who are aware and expert in the implications of digital technologies, facilitating greater involvement of new generations in decision-making processes. New generations tend to show a spirit of innovation, greater resilience, curiosity and less risk aversion to digital technologies. Along with the promotion of education, interviewees highlighted the importance of building a common digital language between scientists and citizens, democratizing digital technologies and enabling access to reliable data. To this end, Switzerland could establish an independent, scientific-led information center focused on digital risks and develop a shared data resource to enhance trust in digital governance efforts.

Investing in Physical & Digital Infrastructure

- ❖ Establish a dual hub, harnessing Geneva's and Zürich's collaborative ecosystems and elevating public-private partnerships
- ❖ Invest in a state-of-the-art digital infrastructure, including leading-edge cybersecurity protocols and digital cloud
- ❖ Incentivize bottom-up tech innovation through tax breaks and grants for start-ups

Geneva and Zurich could serve as a dual hub, harnessing physical infrastructure and fostering closer cross-sectoral collaboration. The financial ecosystem of Zurich can bridge the essential financing gap for start-ups, medium, and large tech companies, which is currently evident in Geneva's architecture dominated by international organizations. In turn Geneva can provide a physical infrastructure, enabling cross-sectoral engagement, for example, through formal and frequent conferences, as well as public-private partnerships. The dual hub would benefit from closer academic collaboration, combining their multidisciplinary excellence and strengthening joint research endeavors while engaging private companies in the process. Moreover, digital infrastructure could elevate these physical components, through cloud-based solutions. Comprehensive data centers can empower cross-sectoral applications and enhancements, stimulating public-private partnerships, for example, through smart city initiatives (digital health hub), bringing the tech sector closer with academia and public institutions. Learnings and data could empower a global knowledge management system, disseminating universal solutions and instruments for other geographical contexts.

Fostering Multi-Stakeholder Collaboration

- Enhance existing and establish new innovation parks, strengthening multi-stakeholder collaboration
- Augment multi-stakeholder collaboration, incentivizing involvement of Global South civil society and private companies
- Support creation of a new institution, for example, inspired by the ILO's tripartite architecture

Our gathered data is clear about the importance of fostering multi-stakeholder collaboration. It is essential for a global digital governance hub to foster an environment of digital innovation. One important step would be to create a Geneva-based dedicated digital governance center that invites and integrates stakeholders from all sectors, including governments, involving the Global South, IOs, the private and public sectors, and civil society. Creating such collaborative spaces, Geneva could become more attractive for tech experts, policymakers, and civil society to participate in discussions on the promotion of cross-sectoral innovation. Such spaces could host hackathons, workshops, anticipatory

discussions as well as conferences that encourage a culture of collaboration and reactive mechanisms.

Alternatively, as suggested by one of our interviewees, Geneva should foster a new public-private organization aimed at being more resilient and adaptive to emerging technologies, similar to the ILO's tripartite structure. This organization would serve as a platform to focus on innovation, cybersecurity, education, infrastructures, technology challenges and economic aspects. The proposed organization would adopt a tripartite model, involving governments (digital ambassadors), private actors and international organizations to address these gaps. For example, Geneva could actively invite and facilitate collaborations between tech giants like Google or Microsoft and local startups to develop and share solutions to common global issues around hot topics like cybersecurity or data privacy, building a bridge between decentralized innovation centers like the Silicon Valley and the ecosystem of International Geneva (science and politics). The creation of this new entity would minimize working in silos, share common best practices, harmonize standardization efforts, and incentivize reforming of existing structures.

Enhancing Geneva's Global Position

- Strengthen and extend science diplomacy initiatives to digital tech diplomacy
- Harness Geneva's image and elevate communication strategy, showcasing tech and policy innovation taking place on the ground
- Support and promote international, public-private tech development, bridging digital divide through initiatives like the Open Quantum Institute

Strengthening international cooperation through science diplomacy can enhance Geneva's global position in digital governance. Maintaining relations and building new alliances with emerging tech countries can facilitate the exchange of best practices and promote digital governance standards. Strengthening existing and establishing new initiatives of multi-country and cross-sectoral tech development, such as the Open Quantum Institute, can bridge digital divide and foster closer collaboration. Attracting private actors, through tax breaks, grants, and public-private partnership would be crucial for elevating Geneva's global position. To this end, Geneva would also benefit from a harmonized and unified communication strategy to showcase tech and policy innovation on the ground and value of

the international ecosystem to a broader public. For example, as highlighted by one of our interviewees, a compelling storytelling approach, such as 'the life of a cell phone' showcasing inputs of decision-making bodies (standardization) on the leading-edge technologies, could improve Geneva's external image. Harnessing Geneva's neutrality and historical contributions to Internet governance, Geneva can establish and host an expert body modeled on the Intergovernmental Panel on Climate Change (IPCC) to provide strategic foresight and synthesis of technological and governance innovations. This new structure could integrate existing advisory bodies, such as the UN Secretary General High-Level Advisory Body on AI, incorporating academic, policy, and tech experts from around the world, to maximize human, financial, and technical resources. Geneva could host annual discussions and harmonize regional innovation hubs, while importantly preserving and fostering involvement of Global South in the evolution of digital governance.

Addressing Governance Gaps

- Support reforming international governance structures, mitigating fragmentation and stabilizing power dynamics
- Advocate for and support establishment of a crisis management center for cyberattacks and data breaches
- Support and harmonize bottom-up initiatives, inspiring global frameworks, standardization, and governance efforts

As mentioned in the second theme, Geneva should support reforming existing international governance structures to become more resilient in coping with technological governance gaps. Switzerland could act as an interlocutor and assessment body, overseeing and managing the overlaps in initiatives and activities currently occurring in Geneva. Mitigating fragmentation by developing strategies that foster cooperation between different international hubs and sectors, promotes a unified approach to digital governance, in which Geneva plays a central role. Pushing initiatives like the Digital Geneva Convention could promote international norms and standards for digital technologies, including cybersecurity, and the risk of fragmentation. Additionally, Geneva could establish a dedicated crisis management center for digital issues akin to the Computer Emergency Response Team (CERT), present in various countries. This would allow Geneva to improve its management of digital crises such as cyberattacks and data breaches and thus become a leading example in its governance

system. Bottom-up approach may be valuable to look at when building a digital governance framework, involving a variety of experts. In the case study of human rights, we can see a greater involvement of digital tech developers, further enhancing the solution oriented design of such initiatives. Switzerland should support and harmonize bottom-up initiatives, inspiring global frameworks, standardization, and governance efforts to leverage its pool of experts.

Preventing Fragmentation as our Worst-Case Scenario

- Promote and extend inclusive multilateralism through multicountry initiatives
- Form new alliances (including non-governmental)

The present architecture of multilateralism, and underrepresentation of the Global South with outdated power dynamics, face a substantial risk of losing relevance in the long-term. In the worst-case scenario, alternative structures led by BRICS+ can destabilize and fragment international collaboration across all disciplines. Especially pertinent with present inefficiencies, underfunding, and geopolitical tensions, the international ecosystem requires an all around reform. Switzerland, as a host state, could adopt a proactive approach in fostering alliances, supporting the integration of various stakeholders, and increasing member states' investment to align with present and future issues and developments. Extension and application of multi-country initiatives such as CERN in other domains can unify an already fragmented and distressed geopolitical landscape.

Conclusion

Our applied research project explores the complexities of global digital governance, focusing on Geneva's potential leadership in this realm. Through extensive literature review, expert interviews, and foresight analysis, this report seeks to connect the different actors for an inclusive and all-encompassing understanding of this broad and fast-growing topic. After synthesizing our findings, we culminate in recommendations ranging from overarching themes to specific strategies. In addition to the research included in this report, it would be interesting to conceptualize a homepage with the aim of sharing our results and visualizing them.

This report has looked at Geneva as a hub for global digital governance based on a rather Western perception of these concepts. It would be meaningful to further investigate and

include the perception of hubs and digital governance in other regions of the world, in order to have a more global and representative understanding.

Our research has demonstrated that global digital governance requires the cooperation of different stakeholders, as well as states from around the world. For Geneva to become a hub of global digital governance, it needs to capitalize on its strengths to grasp the changes in digital technology, balance the interests of all countries and look at the future of global digital governance from a new perspective. We expect our research to bring more discussion and contribute to global digital governance.

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Appendix

Interviews

	Key takeaways	Future scenario & importance of GVA	Trends & signals
Adam Day *Head of the Geneva Office of the United Nations University Centre for Policy Research*	• Challenge to bring together major states and tech corporations to form a consensus and cooperate on digital governance • Lack of cooperation involvement from big tech actors (Google, Microsoft) and leader states (US and China) • Decline in trust due to the collapse of forums for information exchange and meaningful discussion (in the weapons regulation area)	• Forsees increased inequalities due to technology monopolization. • Forsees a greater integration of technologies with a potential human autonomy loss. • Forsees interconnectivity leading to a fragile system, economic collapses and exacerbated inequalities. • Advises to build an independent, scientific-led source of information on digital risks and a pooled data resource to enhance trust in digital governance efforts and anticipate risks.	
Yongling Cheng *Full time researcher at the Guangdong Institute for International Strategies*	• Geneva is an important international platform for digital governance issues • Geneva can provide technology (digital platform ecosystem) beyond the boundaries of traditional industries • The infrastructure of the digital economy (internet, clouding, internet of things) is important for maintaining the security of digital governance, regulation, etc.	• Technology standards are becoming increasingly fierce • Restricting China's high-tech development through regulations, digital competition between China and the US might remain an important trend in the future. • Private digital enterprises will play more important role in global digital governance.	• ChatGPT, AI, Cloud Computing, • Digital economy increasingly fierce
Domenico Zipoli *Project Coordinator at the Geneva Human Rights Platform (GHRP)* *Research Fellow at the Geneva Academy*	• Highlights the importance of multistakeholder participation • Three-way workflow: 1. accessibility 2. Sustainability 3. Interoperability	• Forsees a decentralized governance framework with a main body part governing general issues like accessibility, data sovereignty with representatives from sectoral branches. • Advises the organization in Geneva of group discussions, seminars, workshops and policy roundtables. • Proposes the following governance framework: 1. Policy and regulation (policy development, regulatory recommendations) 2. Technological innovations (new technologies, integration strategies) 3. Building robust partnerships (collaborative efforts, multi-stakeholder approach, sustainability and scaling).	• Rising participation of Latin American countries • Institutionalization • The use of digital technologies for the monitoring and implementation of human rights

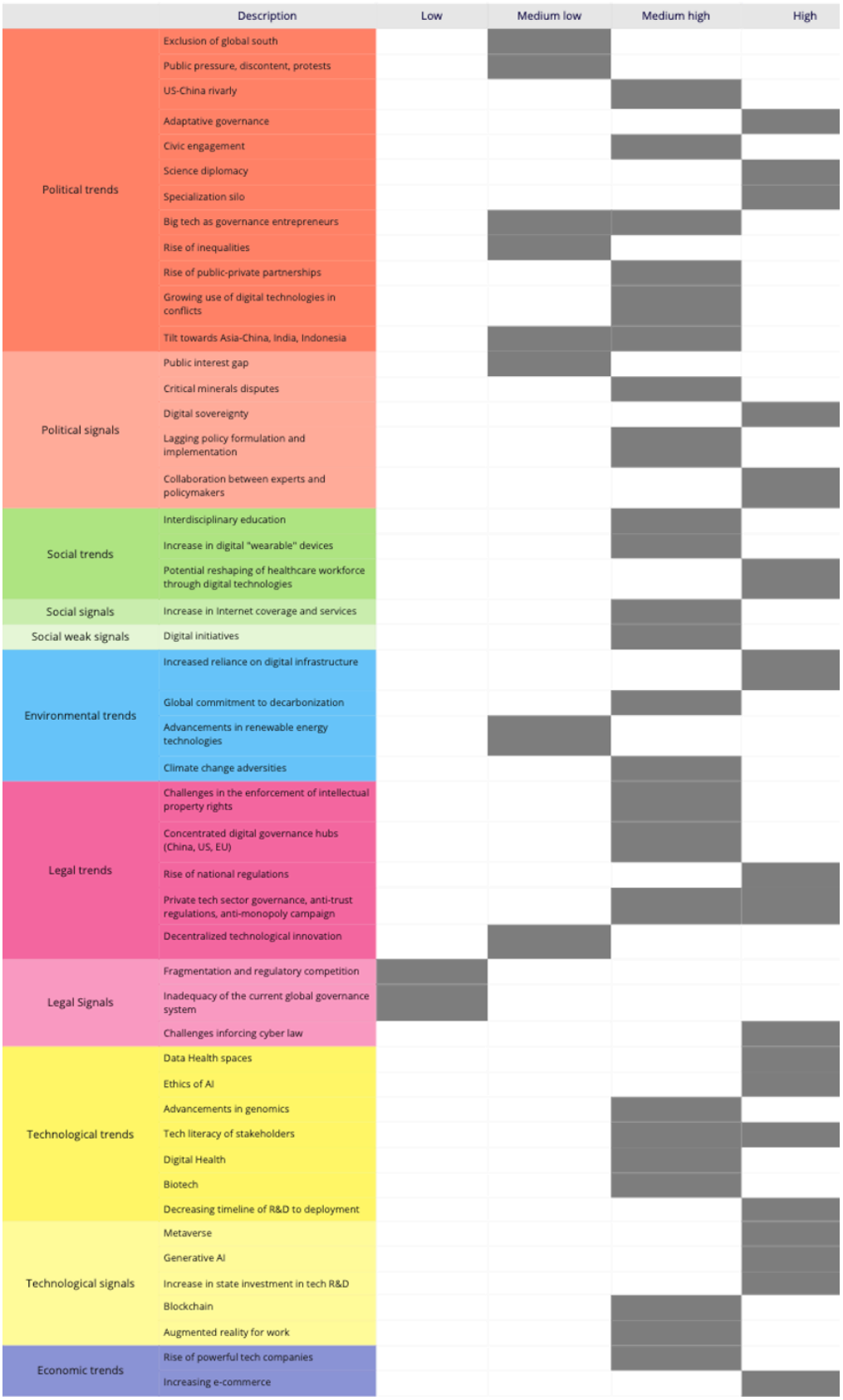
	Key takeaways	Future scenario & importance of GVA	Trends & signals
Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra **Benjamin Rothen** *Head of International and National Affairs, Swiss Federal Statistical Office*	• Data governance definition revolves around technical, legal and institutional implications • The private sector is difficult to access and their importance increase	• Sees Switzerland as a less politicized hub than other places (NY, etc.), holds a good data literacy and important actors such as CERN and WEF able to gather private actors and universities. • Forsees more policies and data spaces • Advises the Swiss government to invest in digital Geneva together with the United Nations.	• Global gatherings: global digital compact • Influence of US elections • Data governance as a prerequisite for a broader digital governance framework • Private sector (tech companies) inclusion • Metadata platforms • Geneva as a collaboration enabler • Ethical use of data
Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra **Jorge Cancio** *Deputy Head of International Affairs, Federal Office of Communications*	• Stresses the importance of the policymaking aspect of a digital governance hub as well as challenges associated with diverse regulations and powers. • Emphasizes the growing importance of digitalization in UN Secretary General's agenda but highlights stagnation and post COVID-19 loss of momentum.	• Forsees a fragmented digital setting • Forsees major players like China and Russia's impact with their disconnection from global infrastructure. • Forsees competition and interdenpence among digital technology actors. • Advises the creation of a connection space, gathering key players, fostering positive sum games and finding synergies. • Advises the determination of the institutions and platforms responsible to address digital governance issues.	• Meaningful connectivity, data governance and AI • Intersection between climate change and digitalization • Cybersecurity • Quantum computing • Policy-level discussions • Tensions between top-down, intergovernmental processes and multi-stakeholder approach
Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra **Benedikt Wechsler** *Head of Division for Digitalisation, FDFA* *Former Consul General of Switzerland in San Francisco*	• Highlights the challenges of data governance with a silo approach and the need for a better cooperation. • Stresses the importance to involve the private sector in data governance to better mitigate cyber attacks. • Stresses the importance to maintain main institution relevant to set the frame for digital governance. • Stresses the importance to create rules and humanitarian standards.	• Advises to create platforms for collaboration between Geneva and the Silicon Valley, hosting flagship events in Geneva and involving organizations like CERN and EPFL similar to Singapore Cyber Week or RSA Cybersecurity Conference in San Francisco • Stresses the importance of a good equilibrium between the public, private and civil sectors. • Forsees digital technologies as a tool of power from government to control their citizens and establish rules. • Advises to keep the balance between safeguarding citizens's rights but promote the private sector and scientists innovation	• Research Hubs such as EPFL, ETH, Zurich, Geneva, IHEID • Strong link between science and digital governance • Geopolitical implications • Quantum technologies and AI dual use for good purposes and weapons • Digital technologies for environment and climate change • Regional regulation of the digital world
Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra **Romain Darioli** *Attaché in Technology and Digital Affairs, FDFA*	• Explores the recurring theme of the implication of digital tools on humanitarian operations. • Tech diplomacy involves tech companies and tech researchers. • Highlights the importance of the swiss neutrality and space for global events • Highlights the united voice of the EU and the lack of the global south's voice. • Emphasizes the importance of digital technologies from a geo-political point of view.	• Advises to create platforms for collaboration between Geneva and the Silicon Valley, hosting flagship events in Geneva and involving organizations like CERN and EPFL similar to Singapore Cyber Week or RSA Cybersecurity Conference in San Francisco • Stresses the importance of a good equilibrium between the public, private and civil sectors. • Forsees digital technologies as a tool of power from government to control their citizens and establish rules. • Advises to keep the balance between safeguarding citizens's rights but promote the private sector and scientists innovation	• Global south missing in tech diplomacy • AI Davos House and swiss initiatives • Generative AI and cybersecurity • Digital governance Convention • Private sector pivotal role • Quantum computing • Semiconductors • Swiss multipliers, multi-stakeholder cooperation
RÉPUBLIQUE ET CANTON DE GENÈVE **Alexander Barclay** *Digital Delegate for the Canton of Geneva*	• Europe, including Switzerland, is dependent on digital technology from US companies which impact digital autonomy • Need to work towards stronger autonomy for countries and democratic systems (from these big tech-companies) • Example of the Cyber Peace Institute's efforts to support NGOs in cybersecurity	• future policy-makers should possess attributes like experimentation, curiosity, and the ability to build regulations • Geneva's role in the future will involve creating a networked system of technology policy-making and regulation • importance of physical presence in a world which is increasingly digitalized • suggestion: reaching out to scholars from universities like BFL or ETH to obtain perspectives from tech firms • advocating the inclusion of diverse voices, e.g. activists like Max Schrems to represent people's interest	• rising discussions on digital sovereignty and autonomy • cybersecurity concerns • organisations are increasingly engaging in horizon scanning

	Key takeaways	Future scenario & importance of GVA	Trends & signals
Google **Anton Aschwanden** *Head of Government Affairs and Public Policy for Switzerland and Austria*	• Emphasis on responsible use of technology, particularly AI • Google follows a cautious approach to AI development and testing • Importance of understanding both the opportunities and challenges that new technologies pose • Need for collaboration and education to enhance tech literacy among decision-makers	• Breaking sylos and improving collaboration ecosystem in Geneva by establishing digital ambassadors and standardizing visit programs • Concerns about organizations potentially moving away from Geneva • More inclusive programs like the Geneva Science Diplomacy Anticipation Radar for preparing for future technology trends • Recommendations to engage with competitors and the private sector like Microsoft or google and collaborate with organizations like Diplo Foundations • Geneva needs better branding and storytelling approach to promote Geneva's role in shaping global technology	• AI debates are quite loud in Geneva • A new generation of polititians and decision makers who better understand technology as compared to older generations • Numerous companies work in silos
TRUST VALLEY **Lenning Pedron** *Director at Trust Valley*	• Definition of digital governance as a body and strategy to support the way to go with everything related to the digital world and ensure that technologies are used responsibly, ethically, securely, covering aspects such as data privacy, cyber security, and digital rights with importance of encompacing policies, standards and processes that guide the management and the use of digital technologies • Collaboration between stakeholders - Geneva has all components but lacks successful involvement • Need of state-lead initative to fill gap, e.g. a separate body involved in platforms and events, linking private and public, and link to Bern	• decrease of trust due to no compliance to a digital governance framework, but the ethical framework could be built in Geneva • Question of who would be leading discussionss? --> WIPO, WHO, Workdbank, WTO, GCSP, FDFA, UN and ITU • need to work on a common data framework • need to support innovation business projects • neutrality of high importance to create guidelines for the public and private sector to include SDGs	• Lack of economic funding from the public sector • Decrease of trust • No private-public collaboration, • Shift in the Netherlands, France, San Fransisco and Singapore • Governance of AI is shifting in New York, • No interest to work outside of silos
FONGIT **Antonio Gambardella** *Director at FONGIT*	• FONGIT supports start-ups that are sustainable and accelerating SDGs • Ensuring the economic stability of sustainable businesses takes < 10 years • Academia is an important value of the Swiss market. • The Silicon Valley could not fit in the Geneva landscape • Israel, Singapore, Hong Kong and Berlin are other innovation hubs	• Advises international organization to anticipate and foster more reactive mechanisms toward digital technologies issues to avoid delay and present solutions • Recognize and promotes a shift in the business management in the younger generations from a company to a foundation. • Advises a better collaboration between tech companies and policy makers with more tech literacy	• Digital trust through blockchain technology • Digital health • Influence of artificial intelligence • Greater mobilization from multistakholders • Regulation delay • Peer-to-peer tech
Proton **Marc Løebekken** *Head of Legal at Proton*	• Tech companies engage with policymakers in capitals such as Brussels and D.C.; Proton is actively engaged in privacy and surveillance regulations, and more competitive digital markets • Swiss investors have a more long-term perspective, injecting capital in mature and potentially profitable innovations, rather than "break things, move fast" and IPO-centered Silicon Valley approach • NGOs often start the innovation process, identifying an issue and developing solutions • Penalties and reputational damage influence behavioral change and responsible practices than common ethical frameworks in tech sector	• Recommends tax breaks and grants for startups to stimulate tech innovation, given comparatively high fiscal and human resources costs. • Advises higher engagement between decisionmakers and the private sector to avoid a unilateral regulatory approach, stimulate a better understanding, and more efficient regulations • Emphasizes that an ideal collaborative ecosystem is inclusive all of stakeholders and cannot thrive with missing links • Highlights that collaboration can also take place virtually, which opens an avenue for new forms of digital interactions and partnerships	• High taxes, especially in the canton of Geneva, disincentivize presence and engagement of private actors • Tech companies have their representatives in capitals such as D.C. or Brussels where large tech governance takes place

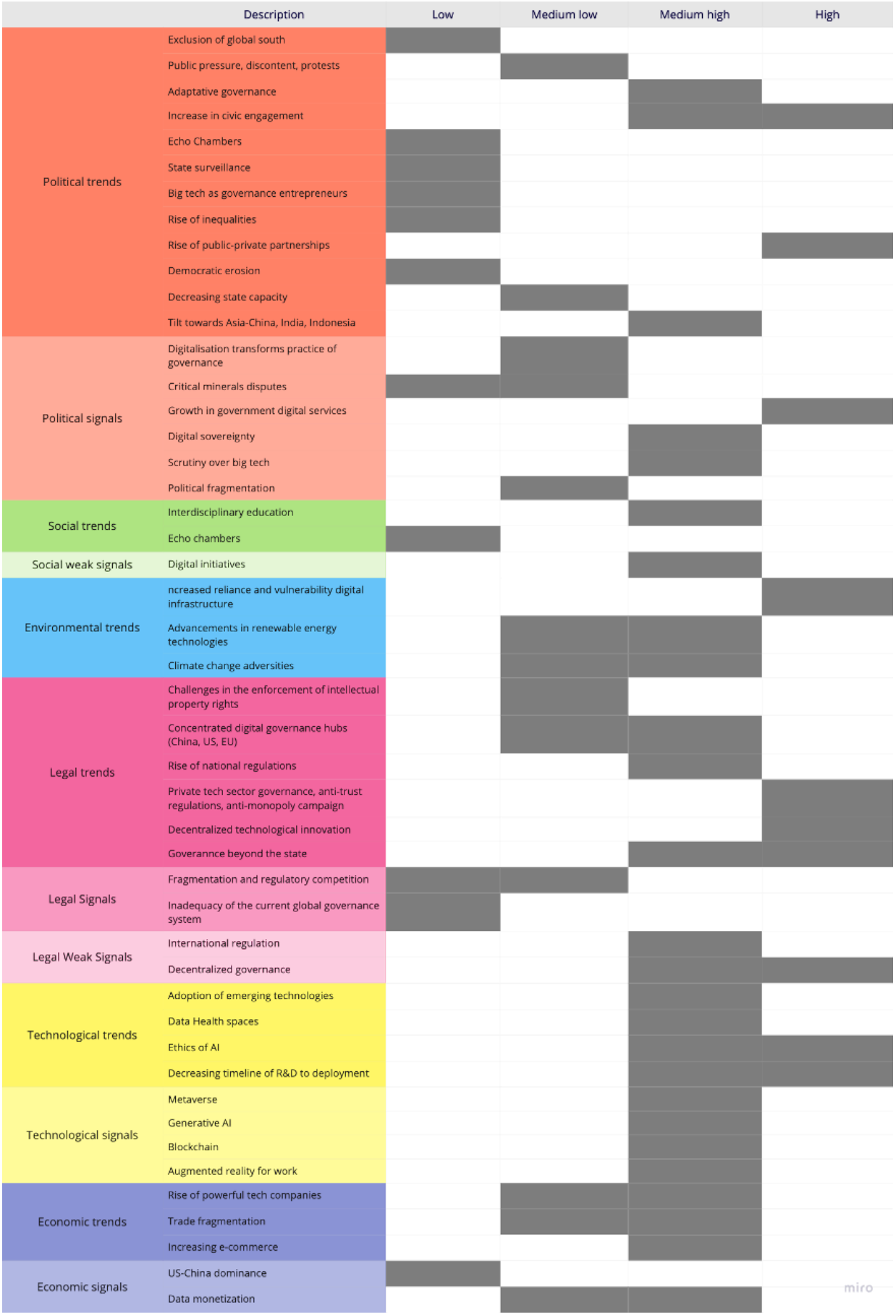
	Key takeaways	Future scenario & importance of GVA	Trends & signals
gesda **Maricela Munoz** *Director of Strategic Partnerships at GESDA*	• Highlights the importance of anticipating science to tackle the rapid pace of digital technologies • Promotes the involvement of the scientific and private sectors as well as citizens in the diplomatic processes • Highlights the dual use of digital technologies and their impact on human rights • Sees Geneva as a fertile ground for global initiatives • Need for tech companies governance frameworks (mandatory resolutions and guiding principles/ best practices	• Advises a democratization of anticipatory science and diplomacy • Showcases the importance of education on digital technologies • Advises the implication of citizens' recommendations in regional, national and global level governance frameworks with an increased participatory approach • Promotes an opened-up approach to include the private sector to the discussion (meaningful participation, money, crucial information) and to diplomacy • Advises to build a common language/bridge between citizens and scientists by promoting education, enabling access to reliable information and democratizing emerging technologies • Advises to continue organizing forum and thematic discussions that gather every sector • Advises to create synergies between similar organizations and take advantage of more advantaged ones	• The GESDA 2023 Science Breakthrough Radar
SDG LAB **Davide Fanciulli** *Assistant Program Management Officer*	• Open Quantum Institute as an example of collaboration • Digital technologies should be user-centric, cross-cultural and cross-sectoral to prevent country privilege and monopolies • Policy and regulations are a crucial mean to balance opportunities and mitigate risks • Connectivity is still highly unequal between International Geneva and developing countries. • Macro-level discussions does not match the need on the ground. • Rising importance of science diplomacy	• Advises more discussions between tech providers and international organizations • Advises international organizations to integrate more checks, balances and transparency to promote inclusive dialogue • Advises long-term sustainability, regeneration, circularity and the inclusion of the youth in decision making processes • Forsees Geneva as a remaining relevant and key hub but other locations will emerge due to shiting demographics	• Quantum computing
World Health Organization **Steve Macfeely** *Director of Data and Analytics at WHO*	• Definition of digital governance revolves around management, control, accountability and transparence with a proper control of digital tools • Highlights data governance as a prerequisite for digital governance • Data governance includes data quality, framework, protection and risk classification (standard risk definition) which involved protection from collection through dissemination • The States have not taken the initiative of requesting, by means of a mandate, the creation of a data framework • Three kingdoms approach: European model (base around the individual), the asian model (based around the state), the American mode (base around the companies) • Geneva is missing the notion of data as a public good and collaboration between researchers and tech companies	• Advises the creation of a generic data governance framework (standards) with a chapel coordinating international data transfer. • Forsees Geneva as the right place to create a Data Geneva Convention	• Digital Health • Data controlled by individuals • Customer centered approach • Transdisciplinary approach • Data quality • Equality
DiPLO **Sorina Teleanu** *Director of Knowledge at DiploFoundation*	• Interlinkage between digital governance and internet governance • Geopolitical tensions in the governance of digital space • Only big data companies (OpenAI, Google, Microsoft, Meta, X) have the resource to participate in and influence discussions • Key obstacles include insufficient dialogue between stakeholders and lack of tech literacy of legislators	• Advises self-assessment of UN agencies on their tech and digital strategy. • Advises a higher presence of the tech sector in Geneva to benefit all stakeholders and a more unified and harmonised civil society • Advises a realistic media coverage and framing of tech (as neither optimistic not pessmimistic)	• Growing implication of AI on agriculture, medicine, biotech, gene engineering, neurotechnologies, etc. • Outerspace as a new competition between private companies for hyperconnectivity • Internet fragmentation • Governance fragmentation

Foresight Scenarios

Scenario 1 - Geneva leads digital governance in one specialization



Scenario 2 - Geneva continues to host digital governance discussions and link existing and emerging international hubs



Scenario 3 - The digital governance landscape becomes increasingly fragmented with new multilateral structures led by BRICS, decreasing the leadership of the International Geneva

Scenario 4 - Geneva strengthens public-private partnerships and fosters a more collaborative ecosystem, further integrating private and civil society actors