Building a Decision-Augmentation Platform to Address Global Issues: Workshop Report

Risto Miikkulainen, Amir Banifatemi, Olivier Francon, and Babak Hodjat

August 26, 2023

1 Executive Summary

On July 5th, 2023, the ”AI for Good Global Summit” in Geneva showcased a workshop titled ”Building a decision-augmentation platform to address global issues”. The workshop centered on establishing a unified platform to tackle global challenges, such as climate change, pandemic resilience, and food safety. With the foundational backdrop of the ITU's Project Resilience, participants aimed to devise universal standards and software that promote collaboration and the amalgamation of regional AI solutions. Key presentations highlighted the initiative's achievements, from Oxford University's pandemic response tracker to Cognizant AI Labs' land-use optimization to control carbon emissions. Breakout sessions facilitated deeper discussions on potential applications, fostering collaborations, and the technical design of the decision-augmentation platform. Overall, the summit underscored the significance of collaborative efforts, the democratization of AI tools, and the value of data-driven decisions to combat global crises. The event championed the merging of human expertise with AI for a brighter global future.

2 Introduction

The workshop ”Building a decision-augmentation platform to address global issues” was held in Geneva, Switzerland, on July 5th, 2023, as part of the ”AI for Good Global Summit”, organized by ITU of the United Nations. The organizers were Babak Hodjat, Olivier Francon, and Risto Miikkulainen of Cognizant AI Labs and Amir Banifatemi of the AI Commons.

The workshop aimed to foster discussions around the development of a collaborative portal and platform to address global decision-augmentation challenges, such as climate change, pandemic resilience, and food safety. The starting point was the ITU's AI and Data Commons' Project Resilience[1], which in turn originated from the XPRIZE Pandemic Resilience Challenge, as well as the COVID-19 Non-pharmaceutical interventions optimization demo of Cognizant AI Labs.

The goal was to seek to establish standards, processes, and software that enable worldwide teams to define project scopes, collaborate on solutions, and integrate local AI efforts to tackle global issues. The platform will serve as a model clearinghouse for AI-based decision augmentation systems and promote the inclusion of local AI contributions into a larger, collaborative system. A crucial aspect of the platform will be the creation and maintenance of standards and APIs to support contributions to the overall project.

The workshop provided a platform for idea exchange, requirement discussions, and exploration of ways to realize this vision. It consisted of introductory presentations on Project Resilience and the Pandemic

[1] https://www.itu.int/en/ITU-T/extcoop/ai-data-commons/Pages/project-resilience.aspx

Response use case, keynotes on data collection, data and architecture considerations, and a demo of the current version of the platform on land-use optimization, a climate change use case. Breakout sessions focused on possible use cases, collaboration opportunities and challenges, and technical aspects of the platform. Wrap-up discussion concluded that such a platform is feasible, and good progress has been made already, but also that it will require a broad spectrum of contributors to work together to realize this vision.

3 Introductory Presentations

On behalf of the co-organizers, Amir Banifatemi of AI Commons welcomed the participants and gave a general introduction to the workshop under the auspices of the ITU agency of the United Nations. The next two presentations gave a general introduction to the project and its origins.

3.1 Overview of Project Resilience

Babak Hodjat from Cognizant AI Labs presented on introductory talk on "Project Resilience," an initiative that promotes global collaboration to address decision-augmentation challenges, such as the COVID-19 pandemic, using AI and machine learning. The key points were:

1. Objective: Project Resilience aims to create an open and publicly available series of cloud-based AI predictors and prescription tools to tackle global decision-augmentation problems.o
2. Goals:
    - Enable collaboration on predictive and prescriptive models.
    - Inform and aid global decision-making on issues like climate change, ecological disasters, disease control, water management, and more.
    - Promote local learnings, data agency, model development, and deployment in various communities while integrating these models into a global framework.
3. Progress:
    - The first phase centered on pandemic resilience, providing a space for collaboration, ensuring interoperability and standards, and gathering useful data sets and models from 104 data science teams across 28 countries.
    - The second phase focuses on building the Project Resilience Platform as a centralized space for collaboration, aiming to harness the energy of local AI efforts to address global challenges.
4. MVP: The MVP workgroup began in the Spring of 2022 with over 20 volunteers. They aim to launch an open platform, with a focus on a climate project, by 2023/2024.
5. Architecture: The architecture consists of several components, from a secure AI development environment to data stores and systems that allow contributors to bring their own model.
6. Data: Emphasis on data requirements, ensuring data is from reliable, trusted, and ethical sources. An example showcased was the IPCC Global Carbon Budget related to emissions from land-use change.
7. Next Steps: These include the ensembling of submitted models, creating automated modules to assess and compare models, and setting guidelines for AI contributors.

8. Call for Volunteers: A significant part of the talk was an appeal for volunteers in various domains, including tech program management, AI/ML, data science, UI/UX, and legal/security/privacy sectors.

The presentation established Project Resilience as a commendable initiative, leveraging global collaboration and the power of AI to address pressing global challenges, with a notable emphasis on pandemic resilience and climate change.

3.2 Pandemic Resilience Use Case

Risto Miikkulainen from Cognizant AI Labs discussed their experience in using AI and data to address the challenges of the COVID-19 pandemic. The team focused on data-driven decision-making, introducing two primary models: a predictive model and a prescriptive model. The predictive model made use of available historical data to anticipate the number of cases, while the prescriptive model provided guidance on actions to take, such as NPIs (non-pharmaceutical interventions) to curb the spread. Risto highlighted the importance of not just predicting but also prescribing solutions that could help decision-makers take effective actions. He showcased an interactive demo to visualize their work and touched upon the significance of the XPRIZE competition in popularizing the initiative. The goal of such efforts is to harness these AI-driven insights to tackle broader societal challenges and create decision-augmentation platforms for global issues. The Key points were:

1. Foundational Work on Pandemic Resilience: The team collaboratively worked on addressing the pandemic, focusing on optimizing decisions using data.
2. Two-fold Model Approach:
   - Predictive Model: Using historical data, primarily the Oxford COVID-19 Government Response Tracker, the team trained a model to predict daily cases based on past cases and NPIs.
   - Prescriptive Model: A more forward-looking model that suggests daily NPIs, given the history of cases and interventions.
3. Challenges in Predictive Modeling: Traditional models like SEIR and agent-based models were slow and too specific. They pivoted to a neural network approach trained with historical data, which provided direct predictions without the need for complex epidemiological estimations.
4. Prescriptor Development: Once equipped with a predictor, the team tackled the challenge of evolving a prescriptor that could navigate an environment with no clear correct answers, using a population-based search to evaluate each model.
5. Trade-offs and Solutions: Risto highlighted that solutions often represented different trade-offs between minimizing cases and the economic cost of interventions, resulting in a Pareto front of choices.
6. Interactive Demo: An online tool, updated daily from May 2020 to Dec 2022, allowed users to get data-based NPI recommendations based on country, date, and desired health/economy tradeoffs.
7. Role of the XPRIZE Competition: By participating in the XPRIZE Pandemic Response Challenge, the team got an opportunity to test and amplify their solution, leading to broader recognition and engagement.
8. Using AI to Enhance Human Insights: The team highlighted the potential of using evolutionary AI to build upon diverse ideas from the XPRIZE entries, realizing the potential of even poor entries.

9. Toward a Larger Vision: The initial demo was built to draw attention to the science, but initiatives like Project Resilience under UN/ITU aim to create an ecosystem harnessing AI for the broader societal good.

The data-driven approach proved to be accurate, adaptable, and general. The team emphasized the importance of making models that are practical for decision-makers, focusing on interactive exploration, uncertainty estimates, explainability, and the merger of human expertise with machine exploration. Future efforts will focus on refining models, enhancing communication with stakeholders, and expanding the scope to address more challenges beyond pandemics.

4 Keynote presentations

Four keynote presentations followed, first expanding on the pandemic data collection efforts, then expanding to general data considerations in Project Resilience, a current demo on land-use optimization, and the general architecture of the proposed platform.

4.1 Building a Data Products in a Pandemic

The (remote) presentation by Toby Phillips, from the Blavatnik School of Government at Oxford University, delved into the creation and challenges of the Oxford COVID-19 Government Response Tracker (OxCGRT) project. Initiated in March 2020, the OxCGRT sought to systematically track government responses to the pandemic due to the initial absence of such data. While the endeavor grew in complexity, it provided invaluable insights for policymakers globally. The volunteer-driven approach was monumental in the data collection process, resulting in tens of millions of hand-coded data points. Moreover, the impromptu emergence of a data ecosystem, like GitHub, highlighted the potential need for a more unified infrastructure for future data-driven crisis management. The talk underscored the lessons learned and pondered on the best practices for global data collection and sharing in the face of subsequent pandemics or global challenges. These were the key points:

1. Initiation of OxCGRT: Recognizing the early void in data about government pandemic responses, OxCGRT was established to answer critical questions.

2. Evolution and Expansion: The project started with 7 indicators and quickly grew to include 11 within a month, later expanding even further.

3. Design Challenges: Creating a system during an ongoing crisis was challenging. The unpredictability of the pandemic meant that decisions had to be made on best guesses, resulting in some sub-optimal design choices.

4. Massive Data Collection: The scale of global data was enormous, with one variable demanding around 200,000 values. Tens of millions of data points were manually curated by volunteers.

5. Collaborative Citizen Science: The OxCGRT's data was gathered in real time by a global volunteer team. Nearly 2000 people participated throughout the project's lifecycle.

6. Infrastructure and Publishing: The COVID-19 pandemic saw the organic rise of platforms like GitHub as a hub for data, though they were not without limitations.

7. Future Preparedness: There's a recognized need to devise a more structured framework for pandemic data systems, emphasizing data taxonomies, common APIs, global health data governance, and quality assurance.

8. Global Cooperation and Challenges: Achieving a systematic global data collection and sharing mechanism requires overcoming barriers, particularly political will. While technology facilitates this, collaborative effort and consistent standards are crucial.

9. Learning from COVID-19: The experience with the pandemic highlighted both the immense potential and challenges of global, collaborative data collection and sharing, setting the stage for how future crises could be managed more efficiently through data.

These points collectively stress the importance of leveraging lessons from the COVID-19 pandemic to improve data collection and sharing frameworks for addressing future global challenges.

4.2 Data Considerations

Gyu Myoung Lee, from Liverpool John Moores University, provided a comprehensive overview of the considerations surrounding data, particularly as it relates to the development of decision-augmentation platforms designed to address global challenges. Central to Lee's discussion was the shift towards a decentralized data infrastructure, the importance of converting raw data into actionable insights, and the establishment of protocols and standards to ensure the integrity, interoperability, and usefulness of the data. These were the key points:

1. The Role of Data: The transition from raw data to valuable, actionable knowledge is fundamental. Emphasizing the move from being cloud-native to AI-native, Lee underscored the importance of big data and AI patterns in generating meaningful insights.

2. Connected Intelligence: AI will be pivotal in creating connected intelligence. This involves leveraging data, not just on a small scale, but using vast patterns to derive AI-based solutions.

3. Decentralized Data Infrastructure: This entails the development of data platforms and marketplaces where data can be exchanged in a trustworthy manner, respecting data sovereignty principles.

4. Blockchain and IoT: The importance of blockchain in supporting the Internet of Things (IoT) was highlighted, especially for resource management. This integration will ensure data transparency, protection, and privacy.

5. 12 Principles for Data Spaces: These principles encompass critical considerations like data curation, trust in data sharing, governance for ethical data usage, decentralization, and user-centricity. These principles form the foundation for developing systems that can interpret and utilize data efficiently.

6. GAIA-X and Federated Services: Emphasis on architectural concepts that bolster data ecosystems.

7. Standardization: For effective decision-making systems, standardized processes are crucial. Lee mentioned several studies, including y.4111, y.4203, and y.suppl.69, which focus on the Internet of Things, description architectures, and web-based data models, respectively.

8. Semantic Definition Framework (SDF): The creation of the SDF helps in harmonizing various data models, ensuring that they are described in a standardized format.

9. Smart Data Models: These are essential for creating a unified digital market for interoperable solutions across various domains.

10. Trustworthiness in Decentralization: While large institutions may be wary of decentralization, it is vital for the creation of a robust and secure data ecosystem.

The workshop and talk emphasize the significance of considering every aspect of data, from collection to analysis, in order to successfully create a platform that can address global issues such as pandemics, climate change, and food safety.

4.3 Climate Change MVP Project and Challenges

Olivier Francon from Cognizant AI Labs demonstrated a decision-augmentation tool focusing on climate change, particularly land-use optimization for carbon emission control. The demo utilized the BLUE model developed for Global Carbon Budget calculations, which is instrumental in understanding where carbon is emitted or sequestered. The model is primarily designed to determine the optimal land-use type—be it forest, crop, or pasture—taking into account the balance between the need to capture carbon and minimize land-use change. Through visual aids, Olivier showcased how various trade-offs are made. A salient feature of this demo was the emphasis on carbon emissions specifically from agricultural practices and the potential expansion of the model to predict migratory patterns due to climate-induced challenges such as rising sea levels, increased heat, and dryness. The demo also highlighted the recurring challenge of missing data. Thus, the key points were:

1. Use Case: The primary use case is land-use optimization for carbon emission control.

2. The BLUE model: Developed for the Global Carbon Budget calculations, this model aids in deciding between land-use types such as forest, crop, or pasture, keeping the carbon budget in mind.

3. Trade-offs: The model seeks the best balance between capturing carbon and minimizing land-use changes, visualized through a curve.

4. Agricultural Focus: The current model particularly emphasizes carbon emissions from agriculture.

5. Potential Expansion: The tool could be expanded to predict migration due to climate-related changes, such as rising sea levels, increased temperatures, and dryness.

6. Missing Data: A constant challenge in these models is the lack of comprehensive data.

7. Urban Areas: The research omits urban areas, focusing instead on lands since urban emissions are transformed and thus do not directly emit carbon.

8. Decision-Makers: The tool is geared towards aiding decision-makers in understanding and implementing the findings.

9. Country-Specific Training: The tool requires distinct training for predictors and prescriptors for each country due to diverse land-use patterns and policies.

10. Addressing Local Decision-Makers: The model acknowledges the decentralized nature of decision-making and seeks ways to address challenges faced at the local level.

11. Political Matters: Addressing carbon emissions is not just a scientific concern but also a deeply political one.

4.4 Architecture Outline and Considerations

Prem Krishnamurthy from Vanguard Groups provided (remotely) an in-depth look into the architecture considerations for ”Project Resilience,” a significant initiative in the ”AI for Good Global Summit” workshop. This project is dedicated to developing a decision-augmentation platform to address global challenges, with AWS services forming the backbone of the platform's architecture. The focus of the talk was on creating a secure, robust, and scalable AI development environment using a suite of AWS tools and services. Here are the key points:

1. Secure AI Development Environment: Project Resilience underscores the importance of having a secure environment for AI development. AWS Service Catalog provides an end-to-end deployment solution, ensuring that authorized users can access and deploy resources without requiring full AWS privileges.
2. Data Science Developer IDE: AWS's Studio domain forms a significant component of the architecture, offering an approved user list, configuration details, Amazon EFS volume, and S3 connections. This ensures that data, notes, resources, and other artifacts are securely stored and easily accessible.
3. MLOps Integration: SageMaker MLOps project templates have been introduced, providing an automated model development and deployment workflow based on CI/CD. These templates are tailored for secure deployment across multiple accounts and are fully integrated with the data science environment.
4. CI/CD Workflows for Model Management: The solution employs Pipelines, AWS CodePipeline, AWS CodeCommit, and AWS CodeBuild for CI/CD. The workflow ensures continuous integration and delivery throughout the entire ML process, from data loading to deployment.
5. Data Security and Governance: Data security is paramount. All data stored in Amazon S3, Amazon EBS, and EFS volumes is encrypted at rest, and TLS 1.2 ensures secure data transfers. Policies in place ensure that data access from Studio notebooks or any SageMaker workload is strictly regulated.
6. Insight Analysis: Amazon QuickSight and WebApp enable comprehensive data analysis, offering interactive dashboards, natural language queries, and machine learning-driven insights.
7. Flexibility with Models: The ”Bring Your Own Model” component ensures that contributors can easily upload pre-trained machine learning models to the system. These models are then compiled for the SageMaker pipeline and packaged for deployment.
8. Future of Decision-making Systems: The architecture laid out in Project Resilience serves as a blueprint for future decision-augmentation platforms. The meticulous integration of AWS services, combined with a focus on security, scalability, and collaboration, offers a template for developing platforms that can address complex global challenges.

In essence, the talk provided insights into the importance of a secure, scalable, and integrated architecture for decision-making systems, especially when addressing global challenges.

5 Breakouts

Inspired by the introductory talks and keynotes, the participants self-organized to three breakout groups to discuss potential use cases, collaborations, and technical designs.

5.1 Identifying and Prioritizing Decision-Augmentation Use Cases

Led by Babak, participants discussed various high-impact applications for the decision-augmentation portal and platform. The session aimed to pinpoint significant use cases, emphasizing areas such as climate change, pandemic resilience, and food security. Several possible use cases were identified, ranging from sustainable peacekeeping and education to migration management and ecological diversity:

1. Sustainable peacekeeping strategies.
2. Allocation of resources in education and decisions on establishing new schools.
3. Management strategies for the end of primary resources, notably gas energy.
4. Formulating effective water management policies.
5. Prioritizing and maintaining ecological diversity.
6. Municipal budget management.
7. Policies for fishing management.
8. Gleaning insights for optimal surgical procedures based on context, past actions, and outcomes.
9. Guided decision-making for relocation and lifestyle changes based on individual profiles and geographic locations.
10. Promoting reusability of items to reduce waste.
11. Strategies to inform management about migration flows.

5.2 Building Collaborative Networks and Engaging Stakeholders

This breakout session, led by Risto, delved into strategies for identifying and collaborating with potential partners, organizations, and contributors. Participants discussed the barriers to effective collaboration and proposed solutions. They used the climate change domain as an illustrative example, identifying a range of stakeholders from sponsors to data sources and highlighting the challenges they face, such as regulatory hurdles and resource constraints. Communication was underscored as a vital tool in bridging the gap between technical and non-technical stakeholders. Strategic partnerships, data aggregation, and fostering credibility through demonstrations were among the proposed solutions. The key points were:

1. Stakeholders in Decision Augmentation: Includes sponsors, users, governments, volunteers, domain experts, AI specialists, and data sources.
2. Challenges in Collaboration:
    - Clear objectives and expected benefits.
    - Establishing networks and mandates.
    - Navigating regulations.
    - Securing resources, primarily funding.
    - Building and maintaining trust and credibility.

- Efficient data collection, management, and feedback loops.

3. Solutions and Strategies:
   - Forming strategic partnerships.
   - Adapting communication to suit different stakeholders.
   - Aggregating data and using demonstrations.
   - Setting clear milestones and regular engagement agendas.

4. Importance of Communication: Effective identification and engagement of stakeholders, adapting the messaging to different recipients, and fostering trust.

5. Strategic Collaborations: Form partnerships during non-crisis times, engage with domain experts, and use demos to build credibility.

6. Approaches to Data Handling:
   - Aggregating data from different sources.
   - Emphasizing data harmonization and authority.
   - Adopting transparent methods, building in public rather than keeping ideas concealed.
   - Developing a shared vocabulary for stakeholders.

7. Credibility Building: Establish trust through performance demonstrations and reputation management. Consider revising data policies to facilitate data collection.

5.3 Designing the Portal and Platform: Architecture, Standards, and APIs

The participants delved into the design intricacies and challenges of creating a collaborative portal and platform to address global decision-augmentation challenges. Olivier first provided a technical perspective, emphasizing the prerequisites for data collection, training predictors, prescriptors, and the debate between open-source versus API-based platforms. The discussion traversed through three key sections: Data, Model, and User Interface (UI). Participants raised concerns about data granularity, model explainability, UI design, and ITU's partnerships with major tech firms. The session also touched on the hurdles of technology, the software supply chain, and the dynamics of collaboration. The key points were:

1. Technical Considerations:
   - Need for a decision on open source versus API for the platform.
   - Challenges in scaling, data collection, and usability for decision-makers.

2. Data Aspects:
   - Three pillars of data: context, actions, and outcome.
   - Importance of capturing both good and bad decisions.
   - Requirement for data granularity and the need for aggregation.
   - Harmonization of data models for effective learning.
   - Approach for companies unwilling to share data - use of APIs for shared models.

- Emphasis on data explainability, traceability, and the role of ITU in setting standards.

3. Model Concerns:

    - Predictors and prescriptors' role in the decision-making process.
    - Selection of appropriate metrics for model evaluation.

4. UI Concerns:

    - Utilizing and comparing models effectively.
    - Need for regional context.
    - Independence from specific vendors in infrastructure.

5. Partnerships and Infrastructure:

    - ITU's collaboration with AWS, Microsoft, and the Kyoto Protocol.
    - An upcoming decision regarding cloud software architecture.
    - The shared ownership imperative for APIs, data, and models.

6. Software Supply Chain and Collaboration:

    - Emphasis on dynamic resources, volunteer participation, incentives, and tools for collaboration.
    - Concerns regarding the reluctance to use existing tools or to adhere to international standards.

7. Technical Challenges:

    - Issues with data uncertainty, user interface latency, and model complexity.
    - Defining reusable project templates.
    - Visualization and explainability of data and model uncertainties.
    - Implementation of conversational AI for data insights and explanations.
    - Concerns about overreliance on generative AI interfaces.
    - Ensuring continuous model updates and understanding local contexts.
    - Provisioning compute resources for developing nations and ensuring access.
    - Concerns regarding model uncertainty and interdependencies.

6 Wrap-up Discussion

The workshop heralded significant strides towards realizing a collaborative decision-augmentation platform aimed at global challenges. The event delved deep into fostering the development of a platform that synergizes global efforts in areas like climate change, pandemic resilience, and food safety. Several pivotal insights emerged from the discussions:

1. There's a clear appetite to involve a broader spectrum of contributors, with suggestions emphasizing the need to onboard more startups, and further explore the potential of no-code AI. This underscores the importance of democratizing AI tools and making them accessible.

2. The idea of model cards being accessible even to non-technical users demonstrates the workshop's inclination towards inclusivity. Participants recognized the need to focus on building foundational capacities rather than merely delivering a final product.

3. A crucial challenge identified was the adoption of AI-driven decision-making tools. Concerns around generational gaps and user preferences for straightforward answers versus raw data were pointed out. Addressing these concerns, the workshop stressed the unparalleled advantage of AI's data-driven decision-making over relying solely on human intuition. To enhance user adoption, the key lies in clear communication, showcasing AI's benefits and limitations, and ensuring the personalization of tools.

4. The workshop highlighted the remarkable progress under the Project Resilience initiative. Not only were successful predictive models celebrated, but the emphasis was also laid on the necessity for prescriptive models. The value of data-driven decisions was reiterated, coupled with the immense potential and challenges of building data products tailored for global issues like pandemics.

In sum, the workshop underscored a collective ambition to harness AI's prowess for global good. It was a clarion call for unity, innovation, and clarity in defining and realizing a collaborative platform that could potentially reshape how humanity addresses its most pressing challenges.

Building a Decision-Augmentation Platform to Address Global Issues

(Also known as

Open Cloud-Based AI Services for Society Resilience)

Agenda

8:00 - 8:30 AM - Registration
8:30 - 9:00 AM - Welcome and Workshop Introduction

- Opening remarks – Amir Banifatemi
- Goals and objectives of the workshop – Babak Hodjat
- Pandemic Resilience Use Case – Risto Miikkulainen

9:00 - 11:00 AM – Keynote Presentations

- Building data products in a pandemic: Perspectives from the Oxford COVID-19 Government Response Tracker – Toby Philips (online)
- Data Considerations – Gyu Myoun Lee
- Climate Change MVP Project and challenges – Olivier Francon
- Architecture Outline and Considerations – Prem Krishnamurthy (online)
- Q&A and Break-Out Session Organization

11:00 - 11:15 AM - Coffee Break
11:15 - 12:00 PM - Breakout Sessions

- Parallel discussions on use cases, collaborative projects, challenges, and design:
    1. Identifying and Prioritizing Decision-Augmentation Use Cases
        - Discuss various use cases for the portal and platform, focusing on high-impact applications such as various aspects of climate change, pandemic resilience, food security...
    2. Building Collaborative Networks and Engaging Stakeholders
        - Explore potential partners, organizations, and contributors for collaborative projects and discuss strategies for effective engagement.
        - Discuss collaboration barriers and propose possible solutions or mitigation strategies.
    3. Designing the Portal and Platform: Architecture, Standards, and APIs
        - Deliberate on the design and development of the portal and platform, including the establishment of standards, APIs, technical challenges, mitigation strategies and best practices.

12:00 - 1:00 PM - Lunch
1:00 - 1:45 PM – Breakout Session Reports
1:45 - 2:30 PM – Post-its Session:

- Everyone gets a chance to contribute their opinions and new ideas to the insights from the breakout sessions.

2:30 - 3:00 PM - Closing Remarks and Action Items

- Workshop organizer's summary and next steps

3:00 - 4:00 PM - Networking Reception

Figure 1: Workshop agenda.

Title	Surname	Given name	Organization	Country
Mr.	Adolph	Martin	International Telecommunication Union	Switzerland
Mr.	Al-Awah	Ahmed	United Nations Economic & Social Commiss ion for Western Asia	Lebanon
Mr.	Atherton	Paul	Fab Data	Palmyra Island
Ms.	Bahay	Jamilah	PoliSync Centre for International Policy Engagment	Switzerland
Mr.	Banifatemi	Amir	AI Commons	France
Ms.	Barberis	Virginia	GFA Consulting Group	Germany
Mr.	Barris	Joaquim	United Nations Framework Convention on Climate Change	Germany
Ms.	Behnad	Jila	Raha Foundation	United States
Mr.	Cadariu	Sasha	Ethical Intelligence	United States
Mr.	Campos	Simeon	SaferAI	France
Ms.	Chipault	Elise	Mason Frank International	Switzerland
Ms.	Curto	georgina	University of Notre Dame	United States
Mr.	Daniel Hernández	Carlos Daniel	Universidad of Salamanca	Honduras
Mr.	Francon	Olivier	Cognizant	United States
Mr.	Frenski	Yane	Vizlai	Bulgaria
Mr.	Guehrs	Markus	CrowdSmart, Inc.	United States
Ms.	Hamdar	Yasmine	UNDP	United Arab Emirates
Mr.	Hodjat	Babak	Cognizant	United States
Ms.	Idec	Paula	Merkle	Switzerland
Ms.	Ismaeel	Halima	Ministry of Transportation and Telecommunications	Bahrain
Ms.	Kachali	Hlekiwe	United Nations Children's Fund	United States
Mr.	Kaufmann	Rafael	Digital Gaia	United States
Ms.	Kleemann	Linda	DIU at GFA Consulting Group	Germany
Ms.	Laribi	Nasrine	Frank Recuitment Group	Switzerland
Mr.	Lee	Gyu Myoung	Liverpool John Moores University / KAIST	United Kingdom
Mr.	Luo	Zhong (Noah)	Huawei Technologies Co., Ltd.	China
Mr.	mackenzie	simon	Simon	United Kingdom
Mr.	Miikkulainen	Risto	Cognizant AI Labs	United States
Mr.	Narayan	Jayant	World Economic Forum	Switzerland
Ms.	Nath	Serena	A.R.I, Artificial Intelligence Research and Development	Canada
Ms.	Popa	Cristina	Accenture	Switzerland
Mr.	RASHID	MD MAMUNUR	Saudi Aramco Entrepreneurship Center Co. Ltd	Saudi Arabia
Mr.	Reali Costa	Luiz Alexandre	Agência Nacional de Telecomunicações - ANATEL	Brazil
Ms.	Roy	Brigitte	Cognizant AIESEC	Switzerland
Mr.	Saroha	Vipin	PwC	Switzerland
Mr.	Taba	Nicolas	Assessment Capacities Project (ACAPS)	Switzerland
Ms.	Ulieru	Mihaela	IMPACT Institute for the Digital Economy	United States

Figure 2: Workshop participants.

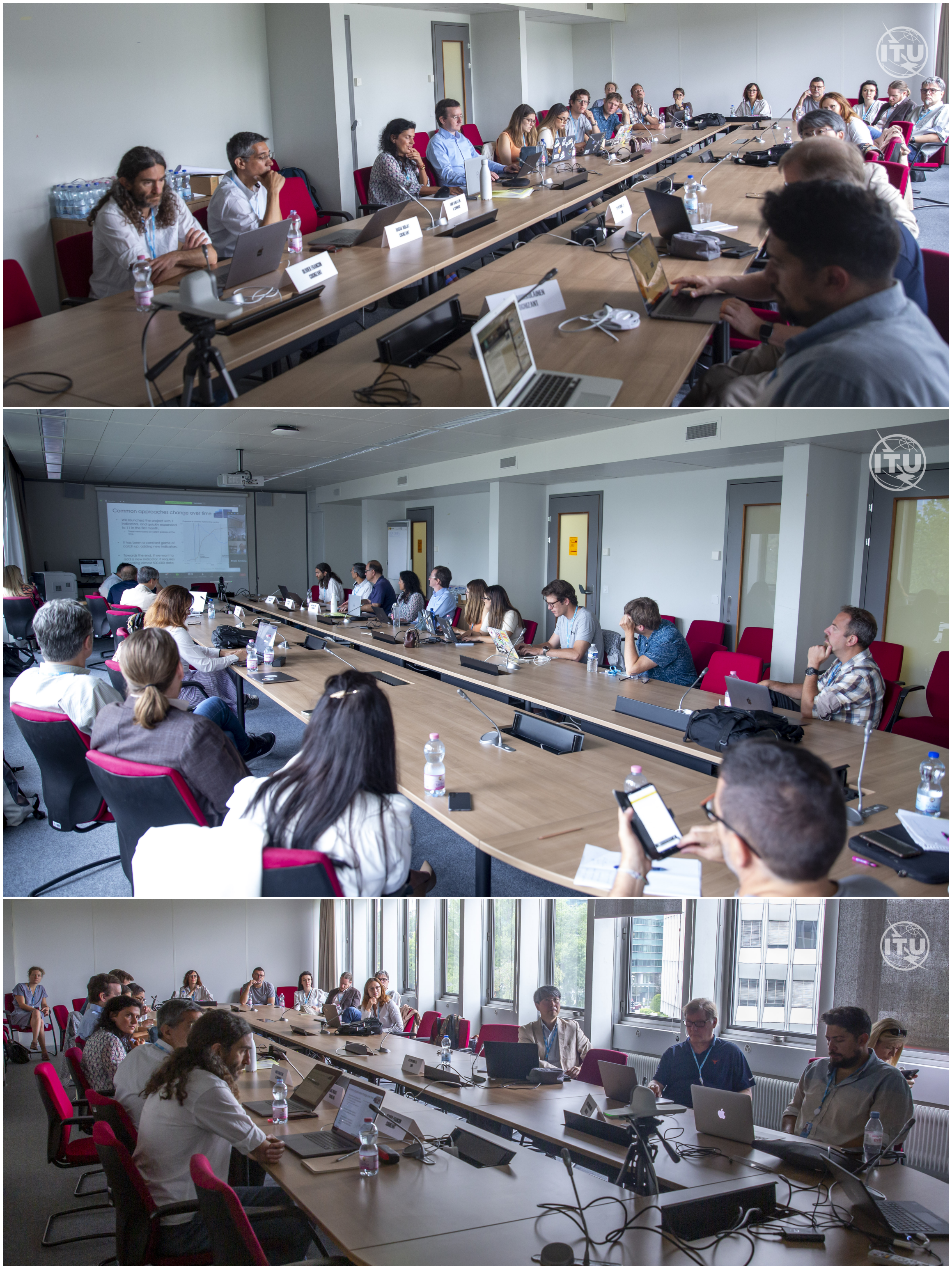

Figure 3: Workshop in session.