Future of Work
Working Group Report

November 2022 - GPAI Tokyo Summit

GPAI | THE GLOBAL PARTNERSHIP ON ARTIFICIAL INTELLIGENCE

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Co-Chairs Foreword

Prof. Uday B. Desai,
Former Director and Emeritus Professor at the Indian Institute of Technology Hyderabad

Dr. Matthias Peissner,
Director, Head of Research Area Human-Technology Interaction, Fraunhofer Institute for Industrial Engineering (IAO)

The Global Partnership on Artificial Intelligence (GPAI) was created as an international and multistakeholder initiative with the mandate of guiding the responsible development and use of AI in a way that is grounded in human rights, inclusion, diversity and innovation, and shared democratic values, as reflected in the OECD Principles on Artificial Intelligence.

In order to carry out this mission, GPAI has brought together Experts from diverse sectors into four specific Working Groups: Responsible AI, Data governance, Future of Work, and Commercialization and Innovation.

The term of the Working Group (WG) on the Future of Work is in line with GPAI's global mission centered around human rights, inclusion and diversity. The WG is mandated to conduct analysis on how the deployment of AI can affect the working environments and the workers as well as how workers and employers can better design the future of work in such a way to preserve or even improve job quality, inclusiveness, and health and safety at the workplace.

In addition, the Steering Committee has expressly designated the WG on Future of Work to carry out new projects dedicated to Education and Training in its Workplan 2023, which will be dealt with in the last part of this report. The projects already underway by the WG are also dedicated to respond to this need, to as far as possible provide a response to the workforce's rise in competence in view of the upheaval that AI will bring to the workplace.

Involving the younger generations in the study of the future use of AI in the workplace is of crucial importance to GPAI and the WG Future of Work. A community of students, the GPAI Junior Investigators, were brought into the Working Group in 2021. From Canada, Europe and Japan (since 2021), they have conducted interviews at companies and helped analyze the results of this work. A new community of students and researchers from India and France was also created to help build the AI Living Lab.

This long-term and future-proof approach allows for students, who are going to work with AI in the future, to better understand this technology and its uses. This in turn feeds into the empowerment of future generations of workers in the design and use of AI. This community will be a major strength of GPAI to conduct projects and to prepare our societies for the future.

We, as co-chairs of the Working Group, warmly thank all the Experts for their commitment to this collective adventure and providing their time, knowledge and expertise to realize the projects. We would like to make specific mention of the leaders of our ongoing projects: Yann Ferguson for the "Observation Platform on AI at the workplace" project, Mark Graham for the "Fair Work with AI" project and Uday B. Desai for the "AI Living Laboratory" project.

Uday B. Desai Matthias Peissner

Working Group Overview and Experts

The GPAI Future of Work (FoW) Working Group's mandate and scope are to:

- Conduct critical technical analysis on how the deployment of AI can affect workers and working environments as well as how workers and employers can better design the future of work.
- Address how AI can be used in the workplace to empower workers, how employers and workers can prepare for the future of work, and how job quality, inclusiveness, and health & safety can be preserved or even improved.
- Include a focus on the education and training needed to prepare the future workforce. The Steering Committee encourages future projects that focus on the education and training needed to prepare people for jobs of the future, as well as on how AI can be leveraged in this education and training.

The FoW Working Group is comprised of 36 Experts, 1 OECD Observer and 8 Specialists who contribute to the three projects conducted in the GPAI 2022 Workplan. As a community, FoW is diverse in terms of stakeholders: 24 Experts come from the Science field, 5 from Industry, 3 from Trade unions, 2 from International Organizations, 1 from the Government and 1 from Civil Society. All GPAI Members nominated 1 or 2 Experts in the Working Group, thus ensuring the geographical diversity. Finally, gender representation is achieved with approximately 42% female Experts and 58% male Experts.

The wide spectrum of expertise of the participants in the Working Group has made it possible to form Committees on major themes regarding the Future of Work:

- Committee on Training, led by Michela Milano; it aims at assessing and developing AI-based methods to train workers and increase their skills, including for jobs of the future (immersive learning, MOOCs, adaptive learning…).
- Committee on Human-Machine Collaboration, led by Laurence Devillers and SeongWon Park; it focusses on analyzing techniques for human-machine collaboration, co-evolution and automated decision delegation, and their impact and the organization and on workers (including physical and mental health).
- Committee on Bias Management, led by Marianne Wanamaker; it provides insight on biases and inequalities generated through AI together with political, ethical and technical guidelines on how to correct them.

and three umbrella committees for developing the following projects, described in the remaining of this report:

- Committee on the Observation Platform on AI in the Workplace, led by Yann Ferguson.
- Committee on the ethical framework for Artificial Intelligence in the labour process, principles written by the post-doctoral student Callum Cant and led by Mark Graham.
- Committee on the AI Living Laboratory to Experiment Use Cases at the Workplace project, led by Uday B. Desai.

Future of Work Experts

Janine Berg; Senior Economist at the International Labour Organization; Switzerland

Nicolas Blanc; CFE CGC National Digital Delegate; France

Manuel Cebrián; Max Planck Research Group Leader (W2); Spain

Uday B. Desai; Former Director and Emeritus Professor; The Indian Institute of Technology Hyderabad; India

Laurence Devillers; Professor of Computer Science and Artificial Intelligence; University of Paris-Sorbonne/CNRS-LIMSI; France

Arisa Ema; Associate Professor at the University of Tokyo; Visiting Researcher at the RIKEN Center of Advanced Intelligence; Japan

Olivia Erdelyi; Lecturer at University of Canterbury, College of Business and Law; New Zealand

Yann Ferguson; Sociologist at Institut Catholique d'Arts et Métiers; The Toulouse Institute of Technology; France

Carl Benedikt Frey; Director of Future of Work; Oxford Martin School, Oxford University; European Union

Mark Graham; Professor of Internet Geography; Oxford Internet Institute; UK

Jenny Grensman; International secretary at Sveriges ingenjörer/The Swedish Association of Graduate Engineers; Sweden

Yuko Harayama; Former Executive Director in charge of international affairs at RIKEN; Japan

John Hepburn; CEO and Scientific Director of Mitacs; Former Vice-President of Research and Partnerships at CIFAR; Canada

Sean Hinton; Founder and CEO of SkyHive; Co-Chair of the Canadian American Business Council's Entrepreneurs Circle; Canada

Elanor Huntington; Dean College of Engineering and Computer Science; Australian National University; Australia

Anne-Marie Imafidon; Founder and CEO of Stemettes; Trustee at the Institute for the Future of Work; UK

Rina Joosten; entrepreneur, board member and publicist, Seedlink Technologies; Netherlands

Bogumił Kamiński; Warsaw School of Economics; Poland

Palmer Luckey; Founder of Anduril Industries; Founder of Oculus VR. United States

Michela Milano; Director of the Centro Interdipartimentale Alma Mater Research Institute for Human-Centered Artificial Intelligence; The University of Bologna; Italy

Johan Moesgaard Andersen; EU Director and International Relations at Danish Metal-Workers Union; Denmark

SeongWon Park; Director, Innovative Growth Research Group; National Assembly Futures Institute, Seoul; Korea

Matthias Peissner; Director, Head of Research Area Human-Technology Interaction; Fraunhofer Institute for Industrial Engineering (IAO); Germany

KingWang Poon; Director of the Lee Kuan Yew Centre for Innovative Cities; Senior Director for Strategic Planning at the Singapore University of Technology and Design; Singapore

Paola Ricaurte Quijano; Associate Professor of Media and Digital Culture at Tecnológico de Monterrey; Faculty Associate at the Berkman Klein Center for Internet & Society, Harvard University; Mexico

Lorenzo Rosasco; Full Professor at the University of Genova; Visiting professor at the MIT; External collaboratore Istituto Italiano di Tecnologia; Italy

Saiph Savage; Assistant Professor at Northeastern University's Khoury College of Computer Sciences; Northeastern Civic A.I. Lab; Universidad Nacional Autonoma de Mexico (Mexico); Mexico

Ajay Shah; Professor; India's National Institute of Public Finance and Policy; India

Márcio da Silva Arantes; Researcher at SENAI; Brazil

Lilijana Šprah; Head of the Sociomedical Institute; The Slovenian Academy of Sciences and Arts' Scientific Research Center; Slovenia

Borys Stokalski; Seed investor of VersaBox; Co-founder and partner at RETHINK; Poland

Oliver Suchy; Head of the Department on Digital Workplace and Workplace Reporting; The German Trade Union Confederation; Germany

Risto Uuk; Policy Researcher at the Future of Life Institute; Estonia

Lucía Velasco; Policy Fellow at the School of Transnational Governance; European University Institute (EUI); Spain

Marianne Wanamaker; Associate Professor of Economics at the University of Tennessee; Research Fellow at the Institute of Labor Economics (IZA); University of Tennessee; United States

Petra Weingerl; Assistant Professor of Law; University of Maribor; Slovenia

Future of Work Observer

Stijn Broecke; Senior Economist (Future of Work) at the OECD

Progress Report

The WG FoW Experts continued the 3 projects started in 2021 and 2022. Namely:

- "Observation platform of AI in the Workplace" (since 2021),
- "AI for Fair Work" (since 2021), and
- "AI Living Laboratory to Experiment Use Cases at the Workplace" (since 2022).

The **"Observation platform of AI in the Workplace"** project aims to design a transversal platform for collecting information on the impact of AI in companies and on workers and to implement an extended catalog of use cases. This information will be the basis to further conduct in-depth studies.

The "**AI for Fair Work"** project is a concrete application of the GPAI mission to bridge the gap between theory and practice, since from an in-depth knowledge of the current reality, the objective is to propose recommendations to decision makers on how to implement AI for fair work. The challenge is to help organizations to implement decent conditions for worker with an inclusive process across geographies, ethnicities, gender, disabilities…

The last project, "**AI Living Laboratory**", started this year is the development of a virtual place, connecting a network of physical Living Labs. It will allow sharing applied experiments for assessing the impact of AI at both individual and company levels. At the 2022 Summit in Tokyo, a Mini Living Lab will be presented and developed thanks to a students' community in India and France.

In parallel with these projects, WG FoW Experts have collaborated on proposals for future projects. They are intended to become extensions and elaborations of the current portfolio and its scope of work, in line with WG mandate (see more in the "Forward Look" section).

In parallel to the projects carried out by the WG, task forces have been set up to perform two specific tasks. The first one consisted in refining the WG's strategy, the second one concerned collecting AI use cases in detailed formats:

- Rina Joosten led and facilitated a process to define a FoW Strategy, enriched from the exchanges with Experts.

  The strategy, together with the five strategic pillars (WHAT, HOW, WHY, Workers and Policy makers), can be used as a framework for the WG, specifically for the co-chairs and projects' co-leaders, to better use the WG's resources and time.
- The purpose of creating use cases under this format is to provide a concrete basis for discussing and understanding the risks, challenges, and opportunities of AI at the workplace. They can be used to inspire the negotiations around the Fair Work Principles and/or to provide the basis for interactive demos in the AI Living Lab.

Observation platform of AI in the workplace

To build a better future for workers collaborating with AI, to be more inclusive on various criteria such as disability, gender, ethnicity... a mandatory initial step is observation. The aim is to capture what is happening in the real context of workplaces: observe AI in the workplace, gather use cases that are as diverse as possible, conduct qualitative analyses of its impact in different situations, sectors, users.

The collection of use cases by GPAI ensures it will be neutral and trustworthy. These two last criteria are central as the Observation platform will allow the Experts to conduct further research and, for example, analyze the reality of AI in companies through: (1) the impact of cultural specificities in the way AI is implemented in the workplace based on a large number of use cases across geographies and cultural contexts, and (2) the possible changes in the way in which AI systems are implemented from ongoing observations. This will provide insights for establishing improved approaches toward human-centered AI in the workplace and will enlighten decision-makers, whether they are politicians or in the private sector.

In 2022, the project has undertaken five main actions:

- Improvement of the questionnaire by integrating the objectives of committees, more particularly on training and biases, in order to make the survey more usable by the Experts for further research analysis. It was decided to introduce these changes on a step-by-step basis to ensure a consistent approach.
- Development of the Students' Community of GPAI Junior Investigators with a country-specific approach to facilitate contextualized and comparative analyses in the future. In 2022, a first study has been completed in Japan and work has been prepared in New Zealand.
- Extension of the catalog. The addition of the survey conducted in Japan and Germany, as well as the integration of some French cases allowed the catalog to grow from 110 to almost 140 use cases.
- Organization of the survey material around a constructive AI taxonomy. This map of smart solutions is intended to facilitate the establishment of a better survey strategy and a better structuring of the produced knowledge.
- Conduct a thematic analysis of the 2020 and 2021 surveys from each committee (the FoW Working Group is composed of 6 committees).

Throughout the year, Experts also collaborated with LaborIA, the French program for the study and development of AI at work. Other partnerships are examined, for example with the Alma Mater Research Institute for Human-centered Artificial Intelligence (Università di Bologna, Italy).

AI for Fair Work

The OECD's Recommendation on Artificial Intelligence was adopted in 2019 as the first intergovernmental standard on AI. The GPAI was founded to advance the values laid out in this standard through multistakeholder research and applied activities. This report has been produced by the GPAI Future of Work working group to build on the OECD recommendation in the specific subdomain of work. The rationale behind this approach derives from the unevenness of much of the existing discussion of the risks and opportunities associated with AI.

Many studies have been carried out on the ethics of work involving AI: for instance, by the OECD, the European parliament, Microsoft, the Vatican, and by most GPAI members. The main issue with existing initiatives to shape AI applications is that they are high-level, which can make them unenforceable, and hence that organizations are largely left to interpret and enact such ethics themselves. There has also been a substantial lopsidedness in stakeholder consultation, with the voices of workers being sidelined in the general discourse.

Despite the proliferation of high-level principles for AI ethics, there are no agreed-upon specific standards for fair, decent, or just work outcomes in workplaces in which humans work in tandem with AI systems. There is a need, which the project is intended to fill, to understand how AI systems are already shaping working conditions and ensure that AI is used to foster decent and fairer work.

Building on existing benchmarks (such as the OECD's AI principles), the project aims to determine AI best practices with regard to working conditions. We are pursuing this goal through two rounds of wide-ranging consultation with key international stakeholders, ranging from Uber and Microsoft to the ILO.

This process has resulted in a set of 10 AI Fair Work principles and operationalizable processes through which such principles can be applied, measured, and evaluated in any workplace. These are, in brief:

1. Guarantee fair work
2. Build and maintain fair production networks
3. Promote explainability
4. Strive for equity

5. Make fair decisions
6. Use data fairly
7. Enhance safety
8. Create future-proof jobs
9. Avoid inappropriate deployment
10. Advance Collective worker voice

The full report will contain both detailed rationales and benchmarks for each principle, which will help stakeholders interpret them in their specific contexts. The consultation to produce these principles has been extensive. Following a literature review which produced an initial draft, we interviewed 21 global stakeholders in-depth to gain their input. This international expert advisory group provided a rich variety of perspectives on the questions of fairness we sought to address. We then followed these interviews up with a focus group which put different stakeholder views in relation to one another. Following a redraft we then conducted a wider survey which was completed by 117 global stakeholders They provided further commentary both on the principles and their associated benchmarks. The result has been the creation of a broad evidence base that has allowed the Experts of Future of Work to produce a report on that balances meaningful standards of fair work with effective implementability.

The final version of these principles will be established and shared on the occasion of the 2022 Summit in Tokyo.

AI Living Laboratory to Experiment Use Cases at the Workplace

The ambition of this project is to create a Living Lab that will be a place of experimentation to address societal challenges around the contribution of AI to the Future of Work. The objective is to propose both a virtual Living Lab allowing to experiment, validate, prototype AI technologies. In a second phase, a network of organizations will be created, either virtual or physical, to connect existing Living Labs, within GPAI countries and perhaps other countries.

2022 was the opportunity for this project to carry out the four following actions:

- Build a new community of students and researchers competent in IT development,
- Develop the prototype of the AI Living Laboratory, named Mini Living Lab,
- Present this prototype at the Tokyo Summit,
- And finally share a report, developed by the student community, to communicate as much as possible about their tool.

This Mini Living Lab is built component by component, using open-source components.
Its development focused on how workers will be impacted by AI, as the mandate of the WG is Future of Work.

The Mini Living Lab has been designed to provide the following content and functionalities:

- The AI Observation Platform Project's case studies (or links to them),
- Additional use cases for specific identified areas (e.g. healthcare, manufacturing, firefighting and education),
- Chatbots, video libraries, and learning/skilling resources,
- Seminal national reports/publications/Living Lab initiatives related to future of work from GPAI Members,
- Access to an international community to connect, share, collaborate and get help on AI topics,
- 24/7 live video connect feature between participating labs to facilitate seamless connectivity across the globe.

Forward Look

The Steering Committee shared guidance for the 2023 Workplan and encouraged future projects that focus on education and training needed to prepare people for AI enabled jobs of the future, as well as on how AI can be leveraged in this education and training.

The Working Group has proposed the following five projects for 2023, subject to GPAI Council approval at the Tokyo Summit.

In 2023, the Working Group has proposed to continue to strengthen its efforts on its three current projects “Observation platform of AI in the Workplace”, “Fair work for AI” and “AI Living Laboratory”. These projects are also dedicated to providing a response to the workforce's rise to competence in view of the changes that AI will bring to the workplace.

In line with the Steering Committee’s guidance regarding the need for a focus on education and training, two new projects have been proposed under the 2023 Work Plan:

- “XAI for education” and
- “CAST – Design Framework for AI Based Solutions”.

These projects would be carried out in synergy with the other Working Groups. Thus, several projects carried out in the GPAI outside the FoW Working Group could be proposed to the Experts to obtain their support. As the “PETs Plus” Project, aiming to demonstrate practical use for privacy-enhancing and adjacent technologies for well-governed data access to AI.

Observation platform of AI in the workplace

As highlighted by the Steering Committee, the proposed project includes a focus on training and skills upgrading (objective 6 below) in order to prepare workers for jobs of the future.

In 2023, the FoW Working Group could consider implementing the following two initial objectives that were postponed due to the strong focus on creating the Students’ Community:

- **Development of the prototype of the Observation Platform**. This prototype will be directly integrated into the virtual Living Lab developed by committee 6. This will make the user experience much richer and facilitate the links between the two projects.
- **Dissemination of the Observation Platform** to the GPAI community and, more broadly, the community of researchers interested in the impact of AI at work.

Together with the four following additional objectives:

- **Onboarding Experts nominated in 2021 and 2022** in the definition of the Students’ community and in the gathering of use cases, together with in-depth analysis of the catalogue.
- **Defining a more accomplished use case selection strategy.** In 2021, the priority was to get more end-user respondents. From now on, the committee will ensure a better representativeness of the different AI systems.
- **Developing the students’ community and integrating new generations**. The Experts are preparing new generations for 2023 first in New Zealand and then in India.
- **Dedicating a specific attention on training and skills upgrading** associated with the integration of AI systems in business.

AI for Fair Work

In 2023, the proposed project aims to **develop one in-depth case study of principle adoption with a partner organization**. The goal is for this case study to act as a significant reference point for the implementation of fairer AI in the workplace which can be cited by a wide range of actors seeking to form policy or best practice. To do so, qualitative data would be collected on the process of principles adaptation by the partner organization. Multi-format research outputs would be produced, hared across social and news media, detailed in academic publications and blogs for wider audience reach, and written up into a second public report specifically focused on practical implementation.

Using the Fairwork methodology, the project would also conduct a **collaborative scoring of at least 4 high-profile employers** who extensively deploy AI in the workplace and engage with them to discuss and shape their use of technology. The impact assessment would be on how the principles can be implemented in a range of sectors, and companies/organizations that have different business, operational and revenue models. This approach would not only positively impact the working conditions of a significant number of workers. Through the direct engagement with the companies, the Experts would also be able to identify direct points of intervention for policy and communicate these to policymakers.

Drawing upon all this work, the objective would be to **publish a second collaborative report** by the end of 2023, which would include a case study of implementation with a partner organization and scores of a number of large, high-impact employers with a prominent profile as users of workplace AI.

AI Living Laboratory to Experiment Use Cases at the Workplace

During the first phase of this project in 2022, a Mini Living Lab will be built and be presented during the Tokyo GPAI 2022 Summit.
Student Experts have been engaged to contribute to this phase, thus strengthening the Students' community of the Working Group.

The project could soon start a second phase, as proposed in the 2023 Workplan, in particular over the first three trimesters of 2023, and focus on the design and development of a prototype of an interactive platform including:

- Access via a mobile device.
- Interactive resources that anyone in the world can experiment with to develop their own AI strategies, such as:
    - chatbots,
    - AR/VR,
    - skills/learning,
    - and tasks/skills/job redesign that have the potential for international impact.

From the last quarter of 2023 onwards, a collaborative platform would be built on top of the previous interactive platform and it would include:

- Features that allow for the exchange of ideas and/or for communities of interest/practice and to form AI communities.
- Online spaces for collaborations on projects (these projects could possibly be curated before approval).

XAI for education

The proposed project XAI (Explainable AI) for education is part of the explainable-AI area, understood as a set of tools and techniques used to help people understand how Artificial Intelligence systems generate certain decisions. The proposed project would be carried out by the Alma Mater Research Institute for Human-Centered Artificial Intelligence on topics related to "Education and AI", the

Research Center on Media Education, Innovation and Technology (CREMIT) from the Catholic University of Milan and of course the GPAI Future of Work Working Group, and more specifically its committee on “Training”.

Focusing on the medical and healthcare area, the project aims to promote the construction of training courses with two main objectives:

1) Highlighting the potential of AI in the work of the future,
2) Addressing ethical issues concerning the use of AI-tools in the workplace.

The use of a Learning Management System (LMS) would allow for **monitoring students’ activities** and collecting data. A **dashboard** would be designed, allowing users to control the data that are collected and how they are used for processing feedback on their learning within the units.

The validation of this training model is a baseline to scale it to other workplaces in the same area and can be adapted to other work fields. The project would increase the awareness on the use of AI techniques in the workplace, foster a broad adoption of AI in companies and in the public sector and put emphasis on the ethical aspects of the technology that are often under-considered.

CAST – Design Framework for AI Based Solutions

The proposed Constructive Approach to Smart Technologies (CAST) project aims to discover design/engineering practices and support companies in turning the potential of Smart Technologies into valuable, effective and responsibly designed Smart Solutions. The existence of such a framework as CAST will be a practical tool beneficial for the entire community of proponents, designers and users of Smart Solutions.

The proposed project includes a pragmatic model of Smart Solution “design space”, validated by studying real-world examples of Smart Solutions. The framework has been developed independently of GPAI activities but benefited greatly from its application to the use cases included in the catalogue of the project “Observation Platform of AI at the workplace”, which provided an early “feasibility feedback” for the key CAST framework concepts. While CAST scope is thus already related to the mandate of the Future of Work Working Group, this project would be an opportunity to develop it further and consider how implementation of AI based solutions affects:

- Workers’ job quality, trustworthiness, inclusiveness, health and safety in the workplace,
- Human cognitive work productivity, agency, and empowerment-by-technology,
- How workers and employers can prepare and better design dignity in work environments.

CAST would evolve to provide “good engineering” practices (its current scope) and “**responsible design”,** including **“responsible design for the work environment**”. Best practices offered by the CAST Framework would be in the form of broadly available educational content (CAST Portal) to enable effective learning and implementation by the organizations.