

Leading Beyond Boundaries

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Held during the World Economic Forum

2024





Executive Summary



Leading Beyond Boundaries took place during the World Economic Forum Annual Meeting 2024 in Davos, Switzerland. The initiative was organized by MIT Media Lab’s Camera Culture Group and MIT Connection Science, in collaboration with the AI House Davos. The Leading Beyond Boundaries’ vision is to transcend disciplinary disconnects that often impede the development of effective technology policy, research, and innovation. To achieve this, Leading Beyond Boundaries convened three expert roundtables focused on critical areas shaping our future: HealthTech, PrivacyTech, and Generative AI. This report synthesizes the key insights and recommendations shared by leading experts in these sessions.

The HealthTech roundtable explored how decentralized data supply chains can foster preventive, collaborative healthcare ecosystems. Discussions emphasized the need to democratize data access, empowering individuals to become active participants in their own health, and enhancing pandemic preparedness through proactive, community-driven models. Central themes included privacy, autonomy, and participation as cornerstones of the future healthcare landscape.

The PrivacyTech roundtable addressed the evolving complexities of data privacy in the era of artificial intelligence (AI). Experts called for greater collaboration across academia, industry, and government to create robust frameworks that navigate these challenges. Key recommendations included establishing clear, enforceable standards for data ethics and privacy, and designing transparent, inclusive data-sharing mechanisms that respect both security and accessibility.

The Generative AI roundtable focused on governance and bias mitigation in AI systems. Panelists underscored the urgent need for global coordination on AI regulation, advocating for policies that promote AI literacy, transparency, and fairness without stifling innovation. The discussion also highlighted emerging risks such as AI addiction and the societal impacts of unchecked AI proliferation, calling for balanced approaches to governance.

These roundtables facilitated in-depth discussions on reimagining healthcare, securing data privacy, and ensuring responsible AI governance. The insights captured in this report aim to guide future technological advancements and policy frameworks, promoting global collaboration around responsible and sustainable innovation.





Building a Preventive and Collaborative Healthcare Ecosystem through Decentralized Data Collection An Autonomous, Participatory, and Privacy-First Approach

HealthTech



Executive Summary

The roundtable highlighted critical strategies to transform healthcare delivery by decentralizing data collection and fostering a proactive, collaborative model. Transitioning from reactive to preventive healthcare relies on data sharing and collaboration across public and private actors. By democratizing data access and utilizing tokenization for secure global insights, healthcare systems can enhance transparency, inclusivity, and knowledge exchange, leading to improved health outcomes.

A key focus was empowering individuals—especially first responders—by providing timely, accurate data for pandemic preparedness and response. Solution-oriented collaboration between academia, industry, and government was identified as essential for addressing complex healthcare challenges and driving innovation in both healthcare delivery and data sharing.

Introduction

Despite monumental advancements in medical science, today's healthcare systems predominantly operate on a reactive basis, focusing more on disease treatment than prevention. This "sick care" model burdens healthcare practitioners and creates misaligned incentives, contributing to escalating healthcare costs. With life expectancies increasing but healthspans – the period of time spent in good health – not keeping pace, a radical shift in healthcare delivery, treatment, and management is imperative.

Our approach diverges from conventional healthcare discussions that often center on specific technologies or diseases like mRNA therapeutics or cancer treatment. Instead, we adopted a systemic perspective to understand the underlying factors that have hampered innovation in healthcare. To this end, we convened a diverse group of leaders from healthcare, business sustainability, and finance to dissect the systemic barriers stifling healthcare innovation and to ideate on sustainable solutions.

Decentralized data collection enables healthcare systems to shift toward proactive monitoring and early detection of health issues by integrating data from a broad range of sources, not limited to clinical settings. For this approach to succeed, data supply chains must be designed inclusively, drawing insights from multiple domains to create a comprehensive understanding of health trends and risk factors. This fosters a more collaborative, holistic approach to healthcare.

Facilitating cross-sector collaboration and knowledge sharing is vital for advancing healthcare systems. Learning from other industries allows healthcare to integrate cutting-edge technologies and strategies, enhance responsiveness and crisis management. Building data literacy among healthcare professionals is equally crucial, enabling them to harness data insights that enhance patient care, optimize operations, and improve healthcare delivery.

To harness the benefits of HealthTech, establishing trust is paramount, and privacy must be prioritized through secure data-sharing mechanisms. This foundation is critical for cultivating a culture of information exchange that enhances public health outcomes while protecting individuals' sensitive information. By implementing these strategies, healthcare systems can evolve into proactive, collaborative, data-driven ecosystems, better equipped to improve health outcomes and meet future challenges.

Actionable Items

While the panel did not deliver specific conclusions, experts agreed on key areas where progress is essential:

Shifting to Proactive, Preventive Healthcare Models

Transitioning to a Proactive Healthcare Model: Healthcare must shift from treating illness after it occurs to preventing it before symptoms arise. This requires a proactive model focused on early intervention, keeping people out of hospitals. By enabling timely data sharing and collaboration across the public and private sectors, healthcare systems can anticipate and address health issues before they escalate. A reimagined, holistic approach to public healthcare management is crucial to meeting community needs preemptively.

Democratizing Data Access: Data-driven HealthTech innovation requires democratized access to health data. This brings Making data accessible empowers individuals while also enhancing transparency and inclusivity in healthcare decision-making.

Tokenizing Data for Global Insights: Tokenization ensures healthcare data remains authentic, traceable, and secure, making it easier to share across platforms and regions. This approach aligns with “privacy by design” principles, allowing data to be safely aggregated and shared globally. Tokenizing data promotes collaboration and knowledge exchange while safeguarding privacy and data rights.

Empowering Individuals as First Responders: First responders play a critical role in health emergencies, and access to accurate, real-time data is key to pandemic preparedness and response. Empowering individuals with health data allows them to take early, decisive action to contain outbreaks and mitigate risks. Solution-centered collaboration between academia, industry, and government is essential to address complex healthcare challenges and drive innovation in healthcare delivery and responsible data sharing.

Fostering Collaboration and Innovation

Solution-Focused Collaboration: Fostering collaboration between academia, industry, and government is essential for tackling the complex challenges facing healthcare delivery and data sharing. Bringing together diverse expertise leads to innovative solutions that improve the effectiveness, efficiency, and resilience of healthcare systems.

Cross-Sector Convergence for Innovation: Encouraging collaboration across different sectors enables healthcare systems to adopt innovative practices from non-healthcare domains. By learning from diverse industries, healthcare can integrate new technologies and strategies that enhance patient care, improve operational efficiency, and strengthen crisis management.

Enhancing Data Literacy for Healthcare Professionals: Data literacy is increasingly important for healthcare professionals to effectively interpret and apply data in diagnostics, prediction, and operations. Enhancing these skills enables professionals to leverage data-driven insights, leading to better patient outcomes, improved decision making, and more efficient healthcare delivery.

Actionable Items

Ensuring Trust and Privacy in Data Sharing

Decentralized Surveillance for Proactive Health:

A decentralized approach to healthcare surveillance promotes proactive monitoring and early identification of health issues through distributed data collection. By decentralizing data collection and analysis, healthcare systems can provide timely, patient-centered interventions that prevent health threats before they escalate.

Inclusive Data Collection for Holistic Insights:

Effective healthcare management requires integrating data from beyond clinical sources, including environmental, social, and behavioral data. This comprehensive approach provides a deeper understanding of health trends and risk factors, fostering more collaborative and holistic healthcare solutions.

Building Trust and Protecting Privacy:

Establishing secure, transparent mechanisms for data sharing is essential for building trust in healthcare systems. Prioritizing privacy protection while enabling individuals to share select health data for the greater good creates a culture of responsible data exchange. This balance supports collective health improvements while safeguarding sensitive personal information.





Forging a Future of AI and Privacy Collaborative Strategies for Academia, Industry, and Government



Executive Summary

The panel discussion centered on strategies to address the evolving challenges of data privacy in the era of artificial intelligence (AI). Collaboration between academia, industry, and government is essential to developing robust standards for data ethics and privacy. Ethical considerations must be integrated into every stage of AI development to protect individuals' rights to privacy and consent.

With AI advancing rapidly, regulatory frameworks must be updated to address privacy, copyright, and the global, multi-jurisdictional nature of AI technologies. Transparency in data usage and AI algorithms is key to building user trust and ensuring accountability in how data is managed.

The adoption of privacy-enhancing technologies can significantly strengthen data protection in AI applications, mitigating privacy risks and enhancing security. Education and awareness programs for citizens, policymakers, and industry professionals are crucial for fostering a culture of responsible data handling and ethical decision-making.

Introduction

Data fuels the development of AI, but this also brings significant ethical and regulatory challenges, particularly in terms of privacy. The sensitive nature of personal data often limits how freely it can be shared, which can slow the responsible development of AI in industries like finance, healthcare, and transportation. Addressing these data privacy concerns is vital to unlocking AI's full potential and driving economic growth.

Recent data breaches have highlighted the urgent need for stronger data protection. As AI systems are trained on vast datasets, businesses are competing for user data, increasing the privacy risks for both individuals and organizations. Additionally, advanced tracking technologies now allow companies to gather detailed user insights with less data, necessitating a reevaluation of privacy norms and how they are communicated.

Recognizing the cultural and regional differences in privacy expectations and regulations is also critical for developing a comprehensive approach to data privacy. By understanding diverse cultural norms and regulatory requirements, organizations can tailor their privacy strategies to align with local expectations and legal frameworks. Implementing localized strategies will create a more ethical, transparent, and privacy-conscious environment in AI, promoting innovation while safeguarding individual privacy.

To explore these challenges, we convened a diverse group of experts from academia, industry, government, and law enforcement. The aim was not to focus on specific technologies, but to develop a holistic understanding of the opportunities and risks associated with data sharing in AI development. Through these types of dialogues, businesses and researchers can work together to advance AI while respecting privacy regulations and ethical standards.

The panel emphasized the importance of collaboration between academia, industry, and government in establishing strong data ethics and privacy standards for AI. Prioritizing data ethics, updating regulatory frameworks, promoting transparency, adopting privacy-enhancing technologies, educating stakeholders, and considering cultural differences are all crucial steps to ensure AI development is ethical, transparent, and privacy-conscious.

Actionable Items

While no specific recommendations were reached, the panel identified several areas where progress is critical:

Collaboration and Standards Development

Foster Collaboration: Collaboration between academia, industry, and government is vital to developing robust standards for data ethics and privacy in AI. By pooling resources and expertise, these stakeholders can create comprehensive guidelines that protect privacy while fostering AI innovation.

Prioritize Data Ethics: Ethical considerations should be integrated into every stage of AI development—from design to deployment. Prioritizing privacy and consent ensures that AI applications respect individual rights and adhere to high ethical standards.

Regulatory Framework Enhancement

Enhance Regulatory Frameworks: With AI evolving rapidly, privacy, copyright, and regulatory frameworks need to be updated to address the global and multi-jurisdictional complexities of AI. New AI regulations must be defined in ways that are robust to changes in technology. By updating and strengthening privacy, copyright, and other regulations, nations can better address the challenges posed by AI's global nature and multi-jurisdictional complexities, ensuring that data privacy remains a top priority in the digital age.

Transparency and Accountability

Promote Transparency: Transparency in data usage and AI algorithms builds trust with users and promotes accountability in data management. Clear, transparent practices help users understand how their data is being collected, processed, and used, fostering a culture of trust and responsibility in AI applications.

Actionable Items

Privacy-Enhancing Technologies

Invest in Privacy-Enhancing Technologies: Privacy-enhancing technologies can significantly mitigate risks and improve data security in AI applications. By prioritizing privacy-first tools, organizations can better protect sensitive information and prevent unauthorized access or misuse.

Education and Awareness

Educate Stakeholders: Raising awareness about data privacy and ethical AI practices among citizens, policymakers, and professionals is essential. Education programs will promote responsible data handling and help instill ethical decision-making in AI development and usage.

Cultural and Regional Considerations

Consider Cultural and Regional Differences: Privacy expectations and regulations vary across regions. Organizations must tailor their privacy strategies to align with local cultural norms and legal frameworks, ensuring compliance and respect for privacy rights worldwide.





***Bridging the gap
between AI regulators,
developers, and
deployers A regulatory
approach grounded in
practice***



Generative AI

Executive Summary

The panel discussion highlighted several critical insights into managing the complexities of generative AI. Central to these discussions were the importance of AI literacy and critical thinking skills, which empower individuals to question and understand AI recommendations. Transparency in AI systems is essential to prevent biases and systemic harms, while balanced regulation is critical to address risks without stifling innovation. The role of human creativity alongside AI was emphasized as a necessary complement to AI's capabilities.

The panel underscored the need to address biases at every stage of AI development and advocated for global enforcement of AI regulations. Concerns surrounding AI addiction, the broader social and ethical impacts of AI, and the difficulty of enforcing regulations across jurisdictions were also explored.

Key themes included AI literacy, transparency, regulation, bias mitigation, global enforcement, and ethical considerations. These insights aim to shape a more ethical, transparent, and privacy-conscious AI landscape, enabling innovation while protecting individual rights and privacy.

Introduction

AI systems are the result of a fragmented global supply chain involving multiple stages—data collection, data augmentation, training foundation models, optimizing foundation models for specific tasks, embedding AI models into systems, and deploying these systems on the market. Each phase can introduce potential biases. Effective regulation must take a holistic approach, ensuring transparency and accountability throughout the AI supply chain to help developers mitigate risks.

Transparency in AI development is critical for understanding potential biases and ensuring accountability, particularly in cases where AI operates independently of human oversight.

The global nature of the AI supply chain complicates regulation, requiring interoperable frameworks and global partnerships. This complexity necessitates international cooperation and standardization to ensure accountability and to mitigate biases across different cultures and societies. The different sizes and organizational structures of the entities involved in developing AI require thoughtful regulatory choices that ensure safety without imposing excessive demands.

Only once an AI system has been developed can its effect on the market be fully assessed. Specifically, it can be extremely challenging to understand how general-purpose AI tools will affect markets given the flexible nature of these technologies. While AI tools can extend human labor, they also threaten to replace certain tasks, which may disrupt specific sectors. This effect is especially complex given that AI relies on pre-existing human content as training data and thus replacing a certain task with AI threatens to lead to ossification.

AI tools still have limitations in terms of the quality of their outputs and, while they may offer cost advantages, relying on AI alone to perform a certain task may ultimately reduce innovation. Encouraging human creativity alongside AI development is crucial. Generative AI, while aiding in overcoming creative blocks and democratizing creative expression, may also lead to homogenization of outputs.

Therefore, it is important to foster other forms of human creativity to ensure these are not negatively affected by the rise of AI. The challenges for generative AI on the input data side center on the quality, diversity, and legality of the data. Human-generated data is essential because it provides a rich, nuanced, and diverse foundation that reflects real-world complexities. Relying solely on machine-generated data can lead to a feedback loop where AI perpetuates and amplifies existing biases or errors present in the original training data. However, data for the development of generative AI models must be obtained legally. Unlawful use of content can lead to legal and ethical issues, compromising the integrity of AI systems and negatively affecting creative industries.

Some applications of AI, for example, in education or legal contexts, raise additional social concerns due to the limitations of these technologies. AI tools, while powerful in processing data and identifying patterns, cannot replicate the empathy, compassion, and nuanced understanding that human educators or judges provide. In education, the value of human interaction lies in the ability to inspire, understand, and respond to the individual needs and emotional well-being of students, fostering not just academic growth but also personal development. In the legal system, the role of a judge extends beyond mere application of the law to embodying justice, fairness, and mercy, weighing the human elements of each case that an AI simply cannot perceive. Consequently, special care needs to be taken when deploying AI in these contexts.

Despite the global nature of AI development, certain countries dominate the supply chain, creating a risk of cementing cultural biases. Without culturally representative datasets, it is unrealistic to expect culturally diverse AI tools. Combating these biases requires global AI literacy to foster more representative AI data and development, and to ensure that AI users, who are often technically unsophisticated, understand the limits of the technology. AI literacy and critical thinking skills are thus essential for individuals to understand and question AI recommendations, thereby fostering a more informed and responsible use of AI technologies. Governments and educational institutions play a vital role in increasing technological literacy to help users navigate the risks and benefits of AI.

Finally, challenges of enforcing AI regulations globally and addressing ethical considerations such as AI addiction and social impact must be acknowledged. These efforts should aim to create a more ethical, transparent, and privacy-conscious environment in the rapidly evolving landscape of artificial intelligence, fostering innovation while safeguarding individuals' privacy rights and data protection.

Actionable Items

While no specific recommendations were reached, the panel identified several areas where progress is critical:

Incentivizing and Harnessing Human Creativity in the Era of Generative AI

Fostering Creativity in the Age of AI:

Generative AI has the potential to democratize creativity, but it also risks producing homogenized content. While AI can aid in overcoming the challenge of the white page and democratize creative expression by leveling the playing field, it may also produce bland, uniform content. Human creativity must be actively encouraged to prevent AI from dominating creative spaces. Further, to ensure the continuity of human-generated data for future model development, new and globally aligned mechanisms for legal data use and compensation need to be considered.

AI in Legal and Educational Domains:

In the legal sector, AI can assist judges but cannot replace the nuanced, empathetic judgment required for fair rulings. In education, AI-generated content should complement human teaching, not replace it. Focusing on how students engage with AI and teaching them to use the technology to extend their abilities can help preserve creativity and critical thinking in learning environments.

Ensuring Accountability in Generative AI

Global Cooperation and Standardization:

Ensuring accountability in AI development requires coordinated international efforts. New frameworks are needed to regulate AI effectively, taking into account cultural differences and societal impacts, to ensure that technology regulation reflects national cultural values.

Liability and Transparency:

Establishing clear lines of liability is crucial, particularly when AI systems operate autonomously. Full transparency in AI development is needed to trace decision-making processes and identify the sources of potential bias. Regulators must understand the risks posed by different AI systems and the data they use to establish effective interventions.

Regulatory Strategies for General-Purpose Foundation Models in AI

Shared Responsibility Across Stakeholders:

AI regulation should distribute responsibility between developers, users, and regulatory bodies. Regulatory frameworks must evolve in tandem with AI advancements to address new risks and opportunities. Although different jurisdictions may adopt different regulatory approaches, global alignment is essential to ensure effective governance of AI.

Boosting AI Literacy and Education:

Governments must prioritize AI literacy to help citizens understand the technology's dual-edged nature. Educational programs should focus on equipping people with the skills to use AI responsibly, fostering critical thinking and promoting informed, ethical decision-making.



Contributors

Abhishek Singh

Researcher, MIT Media Lab

Akhilesh Tuteja

Global Head, Cyber Security Consulting; India Head, Digital Consulting, KPMG

Alex "Sandy" Pentland

Professor, MIT; Director, MIT Connection Science

Anagh Singh

Assistant Vice President, InvestIndia, Ministry of Commerce and Industry, Government of India

Andre Golliez

President, Swiss Data Alliance

Ayisha Piotti

Head, AI Policy Summit, ETH Zurich; Managing Partner, RegHorizon

Brandon Suh

CEO, Lunit Inc.

Caitlin Kraft Buchman

CEO, Women@TheTable; Executive Committee, Geneva Council

Daniel Dobos

Research Director, Swisscom

Deepti Pahwa

Founding Partner, LISA Stanford GSB LEAD Incubator & Accelerator; Research Affiliate, MIT Media Lab

Gabriele Mazzini

Former AI Act Team Leader, European Commission

Georges De Feu

CEO, LynxCare Inc.

Hossein Rahnama

CEO, Flybits; Visiting Professor, MIT

James Landay

Professor and Co-Director, Stanford HAI

Jeannette Gorzala

Vice President, European AI Forum

Kay Firth-Butterfield

CEO, Good Tech Advisory; Former Head of AI and Member of the Executive Committee, World Economic Forum

Leandro Von Werra

Chief Loss Officer, HuggingFace

Maximilian Groth

CEO, Decentriq

Qasim Bukhari

Research Affiliate, MIT

Ramesh Raskar

Associate Director and Professor, MIT Media Lab



Contributors

Rick Bright

CEO, Bright Global Health; Former Deputy Assistant Secretary, U.S. Department of Health and Human Services

Robert Mahari

JD-PhD, Harvard Law School and MIT Media Lab

Roger Dubach,

Ambassador; Deputy Director, Directorate of International Law, EDA-DFAE-FDFA, Swiss Foreign Ministry

Seema Kumar

CEO, Deerfield Cure

Shayne Longpre

PhD, MIT Media Lab

Shri Balamurugan D

IAS, Joint Secretary, Department for Promotion of Industry and Internal Trade (DPIIT), Government of India

Suhair Khan

Open-ended Design; Formerly with Google and Harvard Kennedy School

Tobin South

PhD, MIT Media Lab

Varda Taneja

Vice President, InvestIndia, Ministry of Commerce and Industry, Government of India

Vineet Basotia

Global Head, Strategic Insights and Analytics Health Systems, Philips

Vivek Sharma

Scientist; Formerly with MIT Media Lab, MGH, Harvard Medical School



Editors



Vivek Sharma

Scientist; Formerly with MIT Media Lab,
MGH, Harvard Medical School



Robert Mahari

JD-PhD, Harvard Law School and MIT Media Lab



Abhishek Singh

Researcher, MIT Media Lab



Alex "Sandy" Pentland

Professor, MIT; Director, MIT Connection Science



Ramesh Raskar

Associate Director and Professor, MIT Media Lab

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