DECEMBER 17 TO 19, 2018

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INTRODUCTION

Given the extraordinary implications of emerging technologies on governance, development, and security, there is a growing need to address the tension between innovation and regulation. The Global Technology Summit (GTS) brings together industry leaders, academics, technologists, and policymakers from around the world to examine the impact of emerging technologies on society. As importantly, the summit serves as a mediating space to develop strategies to balance innovation and regulation.

Building on the resounding success of the past two editions of the summit, held in 2016 and 2017, Carnegie India hosted its third annual GTS at the Leela Palace in Bengaluru from December 17 to 19, 2018. As the debate on technology and its social impacts makes headlines around the world, the theme for this year’s summit was Technology and Society: Getting the Balance Right.

The summit began with three student workshops on Data, Artificial Intelligence (A.I.), and Biotechnology on December 17, 2018. The student workshops were organized as part of a new initiative called KnowledgeTransfer@CarnegieIndia. The initiative aims at facilitating a genuine exchange of ideas and knowledge among students, practitioners, subject matter experts, and other interested audiences.

This was followed by two days of captivating discussions on a range of themes including technology diplomacy, data governance, future of digital payments, A.I. in everyday life, 5G and the future of connectivity, building a sustainable innovation ecosystem, safety and ethics of gene editing, the present and the future of a global cyber security landscape.

The summit attracted over 400 hundred attendees from eight countries and witnessed the participation of forty-three distinguished speakers from the government, industry, and academia. The government officials speaking at the summit included the Secretary (West), Ministry of External Affairs, the Ambassador for Digital Affairs, France, the Principal Secretary of the Department of Information Technology, Biotechnology, and Science & Technology, Government of Karnataka, the former permanent representative of India to the United Nations, and the former Deputy National Security Advisor of India.

Numerous experts and industry leaders including Kiran Mazumdar-Shaw of Biocon, Nivruti Rai of Intel Corporation, Mohandas Pai of Aarin Capital, Rob Sherman of Facebook, Shivnath Thukral of Facebook, Gargi B. Dasgupta of IBM Research, Sarv Saravanan of Dell EMC, Anubrata Biswas of Airtel Payments Bank, and Dhiraj Rajaram of Mu Sigma participated in the summit.

Siddhartha Mukherjee, assistant professor at Columbia University and Pulitzer prize winning author, David Bohl, senior research associate at the Frederick S. Pardee Center for International Futures, University of Denver, C. Raja Mohan, director of the Institute of South Asian Studies, National...
University of Singapore, Satyajit Mayor, director of the National Centre for Biological Sciences, and B. Ravindran, head of Robert Bosch Centre for Data Science and Artificial Intelligence, IIT Madras represented academia at the summit.

The summit was generously supported by the Ministry of External Affairs, the Government of Karnataka, K-tech, Innovate Karnataka, Facebook, Biocon, Intel, HARMAN India, and Dell EMC.

The discussions at the summit garnered significant attention from various regional and national newspapers, including The Hindu and Mint. The summit was also well received on social media platforms and was featured on NewsX and NewsX Kannada.

**DISCUSSION HIGHLIGHTS**

The inaugural session of the summit featured A. Gitesh Sarma, Secretary (West), Ministry of External Affairs, Government of India, Henri Verdier, the Ambassador for Digital Affairs, France, Ariel Levite, nonresident senior fellow, Carnegie Endowment for International Peace, and C. Raja Mohan, director of the Institute of South Asian Studies, National University of Singapore. The Secretary (West) discussed the importance of being part of a technology-sharing world as well as the need for India to contribute to the processes and dialogues that set the global agenda. The panelists observed the rapid pace of technological changes that are transforming the way in which the world is organized at the macro and micro levels. This transformation then requires new rules, both within and among states.

The first day of the summit covered a range of topics such as the future of digital payments, A.I. in everyday life, building an innovation landscape in India, and data governance. Panelists argued that technology has led to a more interconnected world. More importantly, they highlighted the need for the government, multinational corporations, domestic companies, and academia to work together to develop a sustainable innovation landscape, and an entrepreneurial culture in India.

The lively debate from the first day continued to the second day where topics like the possibility and implications of advancing 5G, gene editing, cybersecurity, and the impact of technology on society were discussed. The day began with discussions of upgrading the telecommunication infrastructure in India to support 5G. The focus on improving infrastructure will provide a new level of connectivity and access to information, thereby enabling India to develop newer and better technology.

The address on Governance, Technology, and the Future of Innovation by Gaurav Gupta, Principal Secretary for Information Technology, Biotechnology, and Science & Technology, Government of Karnataka, highlighted the role of innovation in spearheading the development of new technologies and enable a more efficient form of governance. This new model of governance using new
technologies would provide citizens with more access to the government while creating a system of maximum governance using minimal human resources.

Data governance was a theme that recurred throughout the summit, especially in light of India’s recent Personal Data Protection Bill, 2018. Panelists believed that India will have to carefully balance enforcement benefits of localization with the compliance costs involved in mandating such a law. The panelists also discussed the role of data fiduciaries, and technical protocol or standards to govern data sharing.

The panel on digital payments underscored that India has started investing in developing a public digital payments framework with initiatives like JAM (Jan Dhan-Aadhar-Mobile) trinity, and Unified Payment Interface. While domestic startups continue to grow steadily, the entry of global players, like Google, PayPal, and WhatsApp in India has revolutionized the nation's digital payments landscape, discussed panelists. The panel on A.I. highlighted the transformative nature of the technology and discussed ways in which India can leverage these technologies to ensure social and inclusive growth. They also made clear that skilling and re-skilling of the workforce is an integral part to adopting sustainable A.I applications.

Given the global controversy over a Chinese experiment that led to the birth of two genetically altered babies, the panel on gene editing evaluated the incredible potential and possible pitfalls of gene editing. Advancements in targeted gene editing technologies are poised to make major contributions to basic research, medicine, public health, and agriculture. Despite these promises, panelists highlighted the need to examine the current state of biotechnology governance, identify gaps in the research, and provide new governance options, while ensuring an appropriate balance between safety, security, and innovation.

As the Summit achieves prominence among international technology and policy debates, Carnegie India endeavors to continue convening diverse stakeholders to shape public dialogue on the implications of emerging technologies on society.

**SUBSIDIARY EVENTS**

On the side-lines of the summit, Carnegie India hosted three student workshops on the theme *Deconstructing Technology and Policy*, under the *KnowledgeTransfer@CarnegieIndia* initiative.

The first workshop on *Modelling A.I. to Forecast the Future* was facilitated by David K. Bohl, senior research associate at the Frederick S. Pardee Center for International Futures, University of Denver. It explored how the University of Denver’s International Futures forecasting platform can be used to model the future development and societal impact of A.I. Participants discussed how modelling long-term trends in A.I. will help decision makers make more informed choices.

The second workshop on *What is “Data:” Understanding Legal Constructions of Personal Data* conducted by Malavika Raghavan, project head of the Future of Finance Initiative, Dvara Research, focused on understanding the legal conception of data, the definition of data as per the I.T. Act, 2000, data
regulation in other jurisdictions and the draft Personal Data Protection Bill, 2018. Participants concluded that there is a need to clearly define data and understand the legal constructs of it, before considering how to correctly and fairly regulate and protect it.

The third workshop on *Biotechnology Research: Balancing Safety and Innovation* instructed by Taslimarif Saiyed, chief executive officer and director, Centre for Cellular and Molecular Platforms, emphasized the need for a streamlined, well- resource regulatory system, and a supportive political environment to promote biotech research in India. The discussion also highlighted the need for a comprehensive dialogue among bioethicists, lawyers, industry players, policymakers, and researchers to assess the impact of biotechnology on society, and the importance of communicating these debates to the general public in comprehensible terms.

In addition to the three student workshops, there were three closed-door discussions held at the summit.

The closed-door roundtable on *Privacy and Innovation: Getting the Balance Right* on December 17, facilitated a discussion among industry leaders, privacy experts, senior academics, and policymakers on strategies to balance privacy and innovation. They noted data is tradable thing and India is one of the largest data banks in the world. To capitalize on this, India needs to create an effective model to regulate data flows.

The closed-door roundtable on *Data Privacy Bill: An Assessment* on December 18, evaluated the impact of the proposed Personal Data Protection Bill on India’s technology and innovation landscape. Participants believed that data localization would restrict innovation and start-ups and hence should not be included as a part of data privacy.

The closed-door roundtable on *Safety, Security, and Promise of Bioengineering* on December 19, was to convene Indian scientists, academicians, and industry to discuss relevant questions on biotechnology opportunities and risks. The participants reiterated the need for the research community to build public trust as well as the need to bridge the gap between the supply and demand for research and development talent in India.
POLICY PATHWAYS

Several substantive recommendations emerged from the discussions at the Summit. The most significant among these are:

Technology and Diplomacy

- The private sector should develop a market-based mechanism to harmonize norms for ethical and acceptable actions and technologies.

- Unlike space and nuclear technologies, whose development was led by governments, the development of emerging technologies, such as A.I. and gene editing, are not under governmental control. The regulation and monitoring of these technologies requires a new model for negotiation which allows space for multiple stakeholders.

Building a Sustainable Innovation Ecosystem

- An enhanced industry-academia relationship is needed to develop a sustainable entrepreneurial culture in India.

- In India, R&D must become a core focus area for both the government and the industry. In addition to the government committing a greater percentage of GDP to scientific research, mobilization of private sector funds is important to develop a sustainable innovation landscape.

- Science and technology must be considered as key economic drivers for India, and hence a policy enabler is needed to divert Corporate Social Responsibility funds to drive investments in long-term research capabilities and innovation. This can help India emerge as a key producer of globally competitive products and services.

- Countries, particularly India, must focus on managing the disruptions to the job market by emerging technologies such as automation.

Data Governance

- The enforcement regime for data protection should be framed in a manner that minimizes the strain on the system. It should make a case for data localization depending on the level of a sensitivity of specific data instead of recommending it as a blanket solution.

- It is important to realign economic incentives for data fiduciaries by prohibiting them from charging anybody for their services, to ensure they serve the interests of the people.
• To ensure that data privacy regulations empower people, it is important to examine the right ways to protect teenagers and reconsider the digital age of consent.

• While data protection laws should be more detailed and prescriptive regarding legal concepts and principles to ensure clarity, the law should also be less prescriptive regarding its technical implementation to permit the emergence of co-regulatory standards.

Governance of Emerging Technologies

• Structural regulatory reforms would likely be more impactful if they are complemented by broader societal inputs on the safety, security, and ethics of emerging technologies.

• The creation of global cybersecurity norms is only possible through the interaction between various organizations, including nation states, civil society groups, UN bodies, academic institutions, and private players.

• While developing a global framework for cyber security, it is important to balance security concerns related to internet governance for the protection of human rights, freedom of speech, and open data.

• Organizations that develop machine learning systems should develop an oversight mechanism to prevent, monitor, and deter bias in A.I. algorithms.

• A comprehensive domestic discourse involving a wide range of stakeholders from the government, industry, academia, and scientific community would enable India to balance safety and innovation of emerging technologies like gene editing in a sustainable and legal manner.

Digital Payments

• To increase the adoption of digital payment methods in India, it is important to enhance digital connectivity throughout India.

• In order to enable the use of certain digital payment methods, it is vital to ease the regulations surrounding the use of cryptocurrencies by the Indian government.

• There is a fundamental design problem with most digital payment platforms in India. While India can derive digital payment strategies from around the world, the diversity of the country, especially in terms of language, needs to be taken into account when trying to increase financial literacy across the nation.
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Student Workshops: Deconstructing Technology and Policy

- Malavika Raghavan, Dvara Trust & Carnegie India
- David Bohl, University of Denver
- Taslimarif Sayed, Centre for Cellular and Molecular Platforms

Roundtable: Privacy and Innovation: Getting the Balance Right

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Technology and Diplomacy

- A. Gitesh Sarma, Ministry of External Affairs, Government of India
- Henri Verdier, Ambassador for Digital Affairs, France
- Ariel Levite, Carnegie Endowment for International Peace
- Chair: C. Raja Mohan, National University of Singapore

Data Flows in the Digital Age

- Rob Sherman, Facebook
- Sanjay Jain, iSPIRT & IIM Ahmedabad
- Smriti Parsheera, National Institute of Public Finance and Policy
- Sunil Abraham, The Centre for Internet and Society
- Chair: Sahil Kini, iSPIRT

New Paradigms of Cancer Therapy for India

- Siddhartha Mukherjee, Columbia University

Reimagining the Innovation Ecosystem: Role of Public and Private Institutions

- Kiran Mazumdar-Shaw, Biocon
- Satyajit Mayor, National Centre for Biological Sciences
- Sarv Saravanan, Dell EMC
- Siddhartha Mukherjee, Columbia University
- Chair: Navneet Kapoor, AP Moller-Maersk

The Future of Enterprise in a Disruptive World

- Dhiraj Rajaram, Mu Sigma

The Changing World of Digital Payments

- Anubrata Biswas, Airtel Payments Bank
- Aparna Krishnan, Mechanism Labs
- Malavika Raghavan, Dvara Trust & Carnegie India
- Nikhil Kumar, iSPIRT
- Chair: Vindu Goel, The New York Times

Artificial Intelligence and Everyday Life

- Amarjot Singh, Skylark Labs
- B. Ravindran, IIT Madras
- Gargi B. Dasgupta, IBM Research
- Manish Singhal, pi Ventures
- Shivnath Thukral, Facebook
- Chair: Manish Sabharwal, TeamLease

Sharing Best Practices: Indian and Global Standards of Data Privacy

- Rob Sherman, Facebook
- Chair: C.V. Madhukar, Omidyar Network

Roundtable: Data Privacy Bill: An Assessment
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Special Address

- Nivruti Rai, Intel Corporation

Linking Villages and Cities in India: 5G and the Future of Connectivity

- Mohandas Pai, Aarin Capital & Manipal Global Education
- Nivruti Rai, Intel Corporation
- Chair: R.K. Misra, Carnegie India

Governance, Technology, and the Future of Innovation

- Gaurav Gupta, Government of Karnataka

Power of Gene Editing

- Ramaswamy S, Institute for Stem Cell and Regenerative Medicine
- Rohan Kamat, Viravecs Labs
- Shambhavi Naik, The Takshashila Institution
- Chair: Vijay Chandru, Strand Life Sciences

Building a Global Cybersecurity Landscape

- Ariel Levite, Carnegie Endowment for International Peace
- Asoke Mukerji, Former Permanent Representative of India to the United Nations
- Latha Reddy, Global Committee on the Stability of Cyberspace and Former Deputy National Security Advisor of India
- Chair: George Perkovich, Carnegie Endowment for International Peace

Technology and Society: Creating a Safer World

- Aparna Krishnan, Mechanism Labs
- David Bohl, University of Denver
- Jahnavi Phalkey, Science Gallery Bengaluru
- Shankar Maruwada, EkStep Foundation
- Chair: Saritha Rai, Bloomberg

Concluding Remarks

- Darshana M. Baruah, Carnegie India
- R.K. Misra, Carnegie India

Roundtable: Safety, Security, and Promise of Bioengineering