Australia
India
Technology
Impact
Assessment

Briefing Note #1

Project Concept

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Abstract

This project promotes rigorous ethical approaches to technology assessments of critical emerging technologies that impact peace and stability. It seeks to strengthen consensus among key stakeholders in Australia and India regarding the importance of a process for technology assessments that can be undertaken jointly with each other. Such activity would represent an important diplomatic innovation in bilateral relations for addressing the challenges posed by rapid technological advances and the evolving geopolitical landscape.

The project aims to create a self-organising community of practice (CoP) inclusive of both countries, ensuring its sustainability after the project's conclusion and potentially extending its influence on a wider multilateral scale. To support these goals, the project will create an open-access curriculum for the professional education of government officials and stakeholders responsible for assessing critical and emerging technologies.

Delivered over a year, the project will be led by a multi-disciplinary team of senior researchers and professional educators from Australia and India who have expertise in technology, industry, economics, geopolitics, and public policy. This initiative is funded by the Australian Department of Foreign Affairs and Trade (DFAT) as part of the Australia India Cyber and Critical Technologies Partnership (AICCTP). This briefing note introduces the scope and activities of the project.

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Objectives

This project is aimed at the development of best practices in joint technology impact assessment (TIA) that underpins international policy on critical emerging technologies affecting peace and stability.

There are 4 main objectives:

1. to document best practices for rigorous identification and forecasting of the ethical, legal and social implications of critical emerging technologies of interest for peace and stability;
2. to strengthen efforts by representative stakeholders in Australia and India to set policy priorities for technology regulation based on joint technology assessments;
3. to seed continuous diplomatic and stakeholder support for the regulation of critical emerging technologies that may create risks to peace and stability; and
4. to develop a curriculum for training government officials and stakeholders of interest who conduct technology impact assessment of emerging technologies.

The project builds on recent calls by leading organisations and think tanks internationally for significant adjustments in technology impact assessment processes. For countries aiming to develop policies for critical technologies that are aligned, the collaborative process would appear to be not only beneficial but also essential.

The project is shaped around existing knowledge of technology impact assessment processes, drawing from previously published research and practices. It aims to develop new multi-stakeholder assessment approaches through workshops, targeted webinars, public outreach, and related professional education. These collaborative activities will foster a self-organising and self-sustaining community of practice in Australia and India focused on consensus-based (bilateral) approaches to technology impact assessment. Such open public-facing fora are absent in the governmental ecosystem in Australia and India. Additionally, there is a lack of consistent commitment to public engagement strategies in technology assessment.

As the policy of the two countries for critical technologies emerges and continues to align in the coming decade, including in the framework of the Quad (a grouping involving Australia, India, Japan, and the United States), the project will lay the foundations for enhanced ethical technology impact assessment. It will also help shape wider international discourse in the field, especially in the Indo-Pacific, providing guidance for decision-makers toward the maintenance of peace and stability.

The project's primary research outputs will be two full-length policy reports. The first of these will address best practice in technology impact assessment (objective 1) while the second report will address the opportunities for bilateral collaboration in technology impact assessment (objective 2). The work on the major research products will also support objective 3 (stakeholder support for joint assessments) and objective 4 (professional education). Additional research outputs include this paper – to introduce the project – and a summative paper capturing the key highlights and outcomes of the project at its conclusion.

Critical and Emerging Technologies for Peace and Stability

The 2020 bilateral agreement on cooperation between Australia and India includes a long list of objectives and principles that address unambiguously core issues of peace and stability, alongside others that might be considered peripheral to the commonly held meaning of these words (Ministry of External Affairs, 2020a):

1. open, free, safe and secure internet for citizens;
2. cyberspace as an economic enabler supporting the goal of prosperity and national development, especially through trade promotion;
3. countering cyber-crime or malicious state activity in cyberspace;
4. treating the increasing frequency of malicious state activities in cyberspace as having the potential to undermine national security and prosperity, and in turn, undermine international peace and stability;
5. protection of fundamental human rights and freedoms online;
6. opposing cyber-enabled theft of intellectual property;
7. ensuring that these technologies are used in a secure and ethical manner; and
8. cooperation in the protection of national critical information infrastructure.

At the same time, Australia and India also agreed to a Joint Plan of Action specifically targeting (1) the innovation economy (2) cyber security and (3) cyber-enabled critical and emerging technologies (Ministry of External Affairs, 2020b). The last of these three sections concerned the economy, making specific mention of 5G, quantum computing, AI and machine learning. In relation to AI, the agreement mentioned the need to work bilaterally to build safe, trusted and ethical practices in its use. The Action Plan also referred to the importance of international norms for controlling AI.

In the years since 2020, the focal points of interests of the two governments in their international policy on critical technologies have broadened and vary according to the forum of discussion. In Australia, one view sees critical technologies as those that impact economic stability, national security, and social cohesion (Australian Trade and Investment Commission, 2024, p. 47). India has referred to an equally broad set of ambitions: to ensure that technology is used in a manner consistent with "democratic values and respect for universal human rights" and "future security and prosperity" (White House, 2024).

Australia has on occasion included the following technologies under the rubric of critical: (1) advanced manufacturing and materials technologies, including semiconductors (2) artificial intelligence (3) advanced information and communications technologies (such as 5G and 6G); (4) quantum technologies (5) blockchain (6) autonomous systems (7) robotics (8) positioning, timing and sensing (9) biotechnologies, such as synthetic biology (10) clean energy generation and storage technologies and (11) digital public goods, such as digital identity and digital payments systems (Australian Trade and Investment Commission (2024). In a bilateral context with the US, and in a national security context, India has noted the following: (1) space (2) semiconductors (3) advanced telecommunications (4) artificial intelligence (5) quantum (6) biotechnology and (7) clean energy (White House, 2024).

In the case of both countries, the expressed national interests in regulating critical technologies appear to extend beyond the normal scope of the concept of peace and stability to economic social policy and public administration.

The Australian and Indian governments do not yet publish an unclassified impact assessment of critical technologies, nor a process by which these are defined, classified and organised with respect to peace and stability. This project will clarify what the range of these interests may be or what the scope of the project might allow, after consideration of issues related to the policy-to-practice gap.

There are different approaches that can be taken toward the identification of technologies that may affect peace and stability. On the one hand, the idea of peace seems straight-forward and would be taken to mean technologies which may impact military power. On the other hand, the idea of stability is more nuanced and less direct. Australia and India share concerns about the harmful actions of certain states in cyberspace that undermine both peace and stability, as noted in the 2020 Australia India Framework Agreement, and mentioned above. A midpoint between these two considerations might include technologies that disturb national or international perceptions of the balance of strategic power between state actors.

The project will investigate how far, and in what ways, the framing by governments of the concept of "critical technologies" might be refined to sharpen consensus around their threats or risks to peace and stability. The characteristics of a good technology assessment may not change much regardless of how we interpret peace and stability. Interpretation will more likely shape the sorts of technologies and case studies we give as examples throughout the project.

Technology Impact Assessment

The broad framings we have seen from Australia and India on critical technologies do not grant a clear direction as to methodologies for how to conduct TIA of classifications of individual technologies or of their strategic impacts operating in combination with other factors. Key statements involving Australia and India on critical technologies, such as the bilateral statement from 2020 (MEA 2020a) and the Quad statement from 2021 (White House 2021), also provide little guidance on TIA for capabilities affecting peace and stability. MEA (2020a), a Framework Agreement on Cyber and Cyber-enabled Critical Technologies, appears to consider security interests that are confined to a 'stable and secure cyberspace'. The White House (2021) refers in broad terms to "fostering an open, accessible and secure technology ecosystem, based on mutual trust and confidence". This approach emphasises transparency and trust as the main criteria for TIA, rather than focusing on definitions of peace and stability.

Australia has set up the Critical Technologies Policy Coordination Office (CTPCO) in the Department of Prime Minister and Cabinet to provide coordinated, whole-of-government advice on technology developments, opportunities and risks, and to recommend actions to promote and protect the development and deployment of critical technologies. The Australian Department of Industry Science and Resources (DISR) offers courses in technology assessment but there is little information on them in the public domain. Australia uses public-facing TIA most commonly in the health, energy and agricultural sectors.

In India, public release by the government of technology impact assessments related to peace and stability is not a common practice. However, the government's planning and policy documents provide some insights into its thinking on these matters. The Ministry of Electronics and Information Technology

(MeitY) serves as the nodal authority overseeing governance efforts related to various emerging technologies, including artificial intelligence, digital public infrastructure, and quantum technologies. The Office of the Principal Scientific Adviser (PSA) advises the Prime Minister and the cabinet on matters of science and technology, and the Department of Science and Technology is responsible for organising, coordinating and promoting science and technology activities in the country. Other departments and ministries also play key roles depending on the specific technology being addressed. For example, the Department of Telecommunications handles matters related to 5G technology, while the Department of Biotechnology handles matters in that field. Additionally, the Prime Minister's Office is involved in critical technology initiatives and coordinates efforts among various departments and ministries.

Both Australia and India have highly active international programmes for coordination of policy on critical technologies with key partners, and these are coordinated by the respective foreign ministries, working closely with national security and some economic ministries. There would appear to be some room however to explore opportunities for more attention to joint technology impact assessments.

This project will emphasise the process of conducting a joint ethical technology impact assessment to ensure an ongoing dialogue between key stakeholders, and not merely on which cluster of technologies might make a top 10 list, or how that list may be organised from more to less critical. This process will recognise the entanglements in global or regional technology ecosystems. Various technological open systems seldom operate independently today, given the nature of socio-technical networks and regimes for international regulation and trade.

Rigorous and high-quality technology impact assessments take substantial time and budget, not to mention the inclusion of diverse specialists. Therefore, governments must be selective about when they invest in such assessments, and the multi-stakeholder methodologies they will employ. The scope is further shaped once we get into bilateral India-Australia joint assessments, acknowledging that respective political sensitivities will act to limit the scope further from the perspective of geopolitics or internal security.

These issues will be explored through a coordinated process of webinars, workshops and research papers.

The primary research that will be conducted will include interviews with up to 20 stakeholders and two hybrid workshops, each accommodating up to 50 participants, held over two half days. The workshops' objectives are to gather input from participants and disseminate established knowledge.

The open-ended stakeholder interviews will focus on gathering open-access information on the following questions:

- Best practices for technology impact assessment affecting peace and stability undertaken by governments or other research organisations whose work is in the public domain;
- Policies of Australia and India in this field and how they align with emerging international practices.

The project team will conduct the interviews with informed consent and under the auspices of human research ethics approval by the Australian National University (ANU). All data and records from the interviews will be securely stored by ANU.

Participant feedback will be collected after each activity to inform future activities. This structured methodology will help to ensure impactful, high-quality activities while laying a sustainable foundation for future governance and collaboration in the domain of critical technologies.

Towards a Community of Practice

A tangible long-term ambition for the project is to create a bilateral self-organising community of practice (CoP). Blended Learning International and InKlude Labs, assisted by all the project team members, will oversee the CoP. The CoP will disseminate the best practices in technology impact assessment and help raise awareness and develop skills between stakeholders in the critical technologies ecosystem.

To cultivate the CoP, the project team will engage with current and former recipients of AICCTP grants whose work aligns with the objectives of this project. Other prospective stakeholders for the CoP will include the experts and participants who take part in the workshops and webinars, and others whose roles have been previously published on public records via government agency web sites or the media.

Professional Education

The project integrates professional educational elements to strengthen bilateral collaboration between India and Australia in addressing critical emerging technologies. This will involve two main elements. First, eight hybrid webinars with international experts, that are designed to support the research objectives of the project, will also serve as important opportunities to disseminate knowledge to a wide group of interested stakeholders in Australia and India, as well as other countries. Separately, after all other activities of the project are completed, the team will develop an open-access short course syllabus for joint TIA aimed at mid-level and senior representatives of government, business and the community.

Our education-related activities aim to equip government officials, policymakers, and stakeholders from Australia, India, and beyond with insights into the ethical, social, and geopolitical dimensions of emerging technologies. These activities seek to offer insights on how to harmonise regulatory frameworks and diplomatic strategies for maintaining peace and stability.

Evaluation

Evaluation for this project will have two components. The first will be commissioned by the Project Team who will appoint an independent evaluator to undertake necessary and proportionate analysis of project activities from the perspective of the Evaluator Terms of Reference (EToR) set out below. The second component will be undertaken separately by the Department of Foreign Affairs and Trade (DFAT) as outlined in the Grant Guidelines. The two components will overlap but the Project Team will take full responsibility for the first component. Team members and the evaluator they commission will make themselves available to DFAT staff for consultation on the second component. All evaluation activities will be scaled according to the small size of the project budget. Team members will undertake their activities with the perspectives of evaluation, monitoring and learning very firmly in mind.

Evaluator Terms of Reference

By the nominated end date of the Project, or earlier if appropriate, the evaluator will provide a short report of no more than 4000 words that summarises his/her analysis of the execution of the project. The evaluator will apply two main lenses: the evaluation criteria set out by the OECD to the extent they are appropriate to this project, and the performance indicators already agreed in contract negotiations with DFAT. The OECD criteria are: relevance, coherence, effectiveness, efficiency, impact, and sustainability. They should only be applied to the extent they are relevant to the purposes and scale of the project as agreed with DFAT. The performance indicators already agreed in connection with specific objectives are set out in Table 1.

Table 1: Outcomes and Indicators

Outcome	Key Indicator
A strong public case for more credible and more comprehensive evidence-based approaches for technology assessment to address risks to peace and stability	Key government officials, stakeholders, analysts, and commentators will explicitly acknowledge that more comprehensive approaches have been undervalued or absent
A strong public case for India and Australia to adopt consistent use of joint technology impact assessments by two or more governments	The same groups will recognise the potential contribution of joint assessments to more focussed policy and to building multinational support compared with unilateral assessments
A developed strategy for professional education, with a supporting curriculum, to satisfy objectives #1 and #2, especially the goals of participatory technology assessment	Stakeholder acceptance of the pedagogy and strategies
Australia and India show higher levels of commitment to the practice of joint international technology assessments, especially for cases affecting international security, and relying on more credible approaches to such assessment	Evident increase of interest in and reliance on mature methodologies. Corresponding abandonment of more superficial and sensationalist types of technology assessment
The emergence of an independent India/ Australia research network and international community of practice for advanced technology impact assessment that will continue after the expiry of the grant and represent a consolidation both of this project's activities and other projects funded by AICCTP over the life of the programme	The degree of interest in formalisation of such a network, within the Australia/ India bilateral relationship or within the framework of the Quad
Enable both countries to explore the optimal balance between innovation and regulation in emerging technologies	The governments and regulators in both countries initiating wider stakeholder consultations leveraging the frameworks defined through this project

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Project Team

The co-chief investigator is **Emeritus Professor Glenn Withers AO**, who is a leading researcher in science and technology cost-benefit and regulation economics. He also researches population, skills and education, and is known for the development of the Australian immigration points system. He is a co-founder of the Crawford School of Public Policy at the Australian National University (ANU), Universities Australia and the Australia New Zealand School of Government and. He has served as Head of the Economic Planning Advisory Council in Australia. The Crawford School of Public Policy at the ANU has access to a wide network in Australia and overseas of specialists in the economic and social aspects of national technology development and assessment. We will also leverage the Global Development Learning Network (affiliated with the World Bank), operating in 80 countries, and chaired by Professor Withers.

Karthik Bappanad, the co-chief investigator with Professor Withers, is a technologist with a keen interest in public policy, and currently a consultant at InKlude Labs, based in Bengaluru India. Karthik was earlier heading CySecK, Karnataka state's Centre of Excellence in Cyber Security, prior to which he was heading Security Engineering at ReBIT. He likes to work in the intersection of technology, policy and ethics. Inklude Labs is a research and consulting organisation, focusing on areas that has an impact on policy and governance. Inklude Labs has considerable experience, including under an existing AICCTP Round 3 grant, in delivering advanced research and related public policy activities along with conducting educational outreach on public policy.

Katina Michael (Senior Member, IEEE) received the B.S. degree in information technology from the University of Technology Sydney in 1996, the Doctor of Philosophy degree from the University of Wollongong Australia in 2003, and the Master of Transnational Crime Prevention degree from the University of Wollongong in 2009. She researches the social, legal, and ethical implications of emerging technologies. She has a joint professorial appointment with the School for the Future of Innovation in Society and the School of Computing and Augmented Intelligence, Arizona State University, where she is the Director of the Society Policy Engineering Collective. She has been funded by national research councils in Australia, USA, and Canada. She is also an Honorary Professor with the School of Business, University of Wollongong, where she was previously the Associate Dean International of the Faculty of Engineering and Information Sciences. She is the Founding Editor-in-Chief of the *IEEE Transactions on Technology and Society*, and formerly EIC of the *IEEE Technology and Society Magazine*, editor at *Computers & Security*, and senior editor at *IEEE Consumer Electronics Magazine*.

Pranay Kotasthane chairs the Takshashila Institution's High-Tech Geopolitics Programme, and teaches public policy, international relations and public finance. He is a co-author of popular books on public policy like 'Missing in Action', 'When the Chips are Down' and 'We, the Citizens'. He is also a consultant with InKlude Labs.

Bharath Reddy is an Associate Fellow with the High-Tech Geopolitics Programme at the Takshashila Institution. His research interests are at the intersections of technology, geopolitics, and India's national interests, focusing on AI governance, open-source technologies, and telecommunications. He also manages the Graduate Certificate in Public Policy (Technology and Policy). Before joining Takshashila, he worked in telecommunications, developing software for 4G base stations.

Professor Greg Austin is a Director of the Social Cyber Institute. He has held appointments in the International Relations Department at ANU, the International Institute for Strategic Studies (IISS), the Department of War Studies Kings College London, and the University of New South Wales in Canberra. He is also currently an adjunct Professor at the University of Technology Sydney. Austin has worked on technology assessment for military and strategic purposes from social science perspectives, including private consultancies for the UK and Japanese governments. His perspectives on technology

assessment have been outlined in his short report authored for IISS, 'Quantum Sensing: Comparing the United States and China' (2024). Austin was co-editor and contributing author for the IISS two-part series on 'Cyber Capabilities and National Power' (2021 and 2023). He has published two books on China's cyber power and co-authored several articles and reports on Russian cyber power.

Dr Brendan Walker-Munro is a Senior Lecturer (Law) with the Faculty of Business, Law & the Arts at Southern Cross University. Brendan's focus is on "research security" – the use of law and policy to protect university research from national security threats such as espionage, foreign interference, hacking, and unauthorised technology transfer. He also researches other aspects at the intersection of national security law and higher education, such as research funding, privacy, and digital security. Brendan is appointed as an Expert Associate (Adjunct) at the National Security College at Australian National University, Canberra as well as a Member of the Queensland Councillor Conduct Tribunal, the Disciplinary Panel of CPA Australia, and a Senior Research Fellow of the Social Cyber Institute.

Lisa Materano is the Chief Executive Officer, Blended Learning International and a Director of the Social Cyber Group. Lisa Materano is a dynamic leader with extensive expertise in education, training, and strategic partnerships. As CEO of Blended Learning International (BLI) and Director of the Social Cyber Group (SCG), she drives innovative programmes in professional development, accredited education, and cyber-focused initiatives. Lisa has spearheaded projects with a global focus, including pathways development under the Australian Qualifications Framework (AQF) and international collaborations such as online course delivery in India and tailored presentations to Chinese delegations. Her leadership reflects a commitment to excellence and a vision for equipping professionals with future-ready skills. In this project, Lisa's strategic insight and passion for impactful education ensure alignment with industry needs and sustainable growth, leveraging her proven expertise in cross-cultural engagement and organisational development.

Adam P. Henry is a Senior Fellow in the Social Cyber Institute and a Partner in the Social Cyber Group. He is a policy and programme specialist in cyber security education, skills and workforce development. He has instigated key pilot programmes that are focused on growing and developing the required multifaceted multidisciplinary cyber skills within the economy. He was invited to participate as a subject matter expert in the 2017 Prime Minister's Cyber Taskforce, and has been invited to brief ministers, shadow ministers and government senior executives on these key topics to develop cyber strategies and initiatives. He has provided key research papers on cyberspace and has been fortunate to be invited globally to speak on these key topics. He has had a broad cyberspace professional career spanning the Australian Public Service, a major consulting firm, academia, working in multiple start ups, his own consulting business and industry accelerators and clusters. Adam is undertaking doctoral studies at the RMIT University where he also facilitates post graduate studies in cyber security, digital and AI.

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