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Perceptions of Emerging & Disruptive Technologies on Crisis Prevention & Management in South Asia

Eva-Nour Repussard

The British American Security Information Council (BASIC)
Work + Play
111 Seven Sisters Rd
Finsbury Park
London N7 7FN

Charity Registration No:
1001081

T: +44 20 3488 6974
www.basicint.org

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Author

Eva-Nour Repussard is a Policy Fellow at BASIC, where they work on the Nuclear Responsibilities programme. Prior to that, Eva-Nour was a Project and Research Assistant at SCRAP Weapons, co-coordinating the strategic stability project.

They hold a MA from King's College London in Intelligence and International Security and a BA (Hons) in International Relations from the University of Birmingham and Fudan University in Shanghai.

Eva-Nour's expertise is on strategic stability. They notably have spoken at NATO's 5th Early-Career Nuclear Strategists Workshop, at the EU Non-Proliferation and Disarmament Conference (EUNPDC), at CSIS PONI Winter Conference, and at UK PONI Annual Conference on the cyber-nuclear nexus, and its threat to strategic stability and deterrence. They also have spoken at ISYP Third Nuclear Age Conference and at the EUNPDC Next Generation Workshop.

About BASIC

BASIC is a London-based think tank that promotes meaningful dialogue amongst governments and experts in order to build international trust, reduce nuclear risks, and advance disarmament.

We have a global reputation for convening distinctive and empathic dialogues that help states overcome complex strategic and political differences.

Our established networks and expertise, developed since 1987, enable us to get the right people in the room and facilitate effective, meaningful exchange between siloed and often hostile political communities.

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Part A

PART I.

Introduction

Between 2023 and 2024, BASIC conducted a project that assessed which existing crisis management mechanisms have been effective in de-escalating past India-Pakistan crises.

One of the main takeaways from that project was that 'in the India-Pakistan nuclear dyad, there is mutual confidence that the other can be relied upon to show restraint in times of crisis and not push their adversary into a choice between a humiliating defeat and escalating the crisis to the nuclear level'.[1]

However, the increasing emergence of emerging and disruptive technologies (EDTs), globally and in South Asia, raises the question of whether restraint can be maintained in this new strategic environment. To answer this question, BASIC is running a project between 2024 and 2025, titled, 'Addressing Emerging Nuclear Risks to Crisis Prevention and Management in South Asia through a Responsibility-Based Approach'. The project seeks to expand and strengthen the regime of restraint and responsibility within South Asia by exploring how a responsibility-based approach can reduce nuclear risks by helping India and Pakistan respond to the challenges posed by EDTs in the near-term (5-10 years) to effective crisis management and prevention. To do that, BASIC first conducted a survey, to assess threat perceptions of EDTs in South Asia.

1 Cervasio, C. Wheeler, N. J. and McClafferty, M. (2024) Crisis Prevention and Management in South Asia: Mutual Confidence, Risk, and Responsibility. BASIC. Available at: https://basicint.org/report-crisis-prevention-and-management-in-south-asia

This report first discusses the survey methodology. The report then moves on to present the findings and, in the analysis section, such findings are discussed. The findings from this report will serve as a foundation for the upcoming BASIC dialogue in Bahrain in 2024.

The first finding shows that, with regards to crisis prevention and management, all surveyed groups agree that there is a 'maturity gap' between India and Pakistan in relation to most EDTs assessed, however such a 'maturity gap' is dependent on the different technologies. Another finding is that almost all EDTs surveyed are perceived much more negatively by the Pakistani respondents in comparison to the Indian and non-South Asian groups. Finally, Quantum for C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance) stands out in all surveyed groups as being an EDT with a potential beneficial impact on crisis prevention and management in South Asia.

Based on the survey data, several observations can be drawn: (i) AI for information warfare appears as the most controversial EDT with regard to its maturity level; (ii) there is a 'Maturity-Perception Effect', in which overall, the more mature a technology is, the more disruptive it is perceived with regard to crisis prevention and management; and (iii) there is a potential bias in which nationals of the country which possesses and is developing the EDT perceives it more positively than participants from the country that does not have the technology developed to the same degree. Finally, the report discusses why quantum for C4ISR appears to be an EDT that is perceived by all groups as having a potential beneficial impact with regard to crisis prevention and management.

> ***There is a 'Maturity-Perception Effect', in which overall, the more mature a technology is, the more disruptive it is perceived with regard to crisis prevention and management.***

Maiden flight of the Autonomous Flying Wing Technology Demonstrator from Chitradurga ATR.

PART II.

Methodology

Survey Design and Objectives	The primary aim of the survey was to gather experts' opinions from India, Pakistan, and the wider international community on the perceived risks and opportunities posed by various EDTs on crisis prevention and management. The survey used the Systematic Technology Reconnaissance, Evaluation, and Adoption Methodology (STREAM), first developed by Popper et al.,[2] and then used by Favaro,[3] to evaluate both emerging and established technologies across a range of criteria, including their impact on crisis management and prevention and their level of maturity within specific countries.
Participant Recruitment	Participants were selected based on their expertise in South Asian regional security and emerging and disruptive technologies. The recruitment process began with desk-based research to identify individuals knowledgeable in these domains. We also relied on our regional network, which helped identify and recommend additional participants. A total of 109 individuals were invited to participate in the survey, including a mix of Indian, Pakistani, and non-South Asian experts, all with demonstrable experience in EDTs and South Asia.
Survey Distribution and Structure	Between July and August 2024, BASIC sent out the survey to the selected participants. The survey was administered via Google Forms, with participants being informed that no question was mandatory. They were encouraged to skip questions if they were unfamiliar with certain technologies, ensuring that responses were only provided for technologies they had sufficient knowledge of. Following the STREAM Methodology, participants were asked to rate the impact of each technology on India-Pakistan crisis prevention and management mechanisms on a scale of 1 to 7, with 1 indicating a highly negative impact and 7 indicating a highly positive impact. Additionally, participants were asked to assess the maturity of each technology in both India and Pakistan, using a scale of 1 to 5, where 1 represented a mature technology and 5 an immature one. The survey comprised a total of 10 close-ended questions for each of the 11 selected EDTs.[4] An optional text box allowed respondents to explain their ratings for each question, offering qualitative insights alongside the quantitative data.

2 Popper, S. W., Kalra, N., Silberglitt R. et al. (2013) 'Strategic Issues Facing Transportation, Volume 3: Expediting Future Technologies for Enhancing Transportation System Performance', NCHRP Report 750. Available at: https://doi.org/10.17226/22448

3 Favaro, M. (2021) Weapons of Mass Distortion: A new approach to emerging technologies, risk reduction, and the global nuclear order. Centre for Science and Security Studies. https://www.kcl.ac.uk/csss/assets/weapons-of-mass-distortion.pdf; Favaro, M., Renic N., and Kühn U. (2022) Negative Multiplicity: Forecasting the Future Impact of Emerging Technologies on International Stability and Human Security. IFSH. https://ifsh.de/en/publications/research-report/research-report-010

4 The questions used to assess perceived impact on crisis management and prevention, and maturity, can be found in Annex 1.

Response Rate and Demographics

Out of the 109 individuals invited, 44 experts completed the survey, yielding a response rate of 40.4%. The respondents consisted of 13 Indians, 20 Pakistanis, and 11 from non-South Asian countries, with a relatively balanced gender distribution (21 women and 23 men). These respondents were drawn from a diverse range of backgrounds, including academia, think tanks, and non-governmental organisations, ensuring a well-rounded perspective on the selected technologies.

Selection of Technologies

The technologies assessed in the survey were chosen through a combination of desk-based research and consultations with South Asian experts. The 11 EDTs included in the study were selected for their relevance to regional security and crisis prevention and management, with technologies deemed not yet mature enough in the region being excluded. The selected technologies were:

1. Artificial Intelligence (AI) for Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR);
2. AI for Information Warfare;
3. AI for Weapons and Effects;
4. AI for Cyber Operations;
5. Quantum Technologies for C4ISR;
6. Multiple Independently Targetable Re-entry Vehicles (MIRVs);
7. Hypersonic Cruise Missiles;
8. Ballistic Missile Defense (BMD) Systems;
9. Directed Energy Weapons (DEWs);
10. Non-Kinetic Anti-Satellite (ASAT) Capabilities;
11. Kinetic ASAT Capabilities.

To ensure all participants had a uniform understanding of the technologies, participants were given definitions for each EDT surveyed.[5]

Bias and Limitation Data Analysis

This study is subject to certain limitations, most notably selection bias. Since many of the respondents were known to BASIC or our network, the pool of participants may not fully represent the broader spectrum of opinions within the region or the field of EDTs. Additionally, although we invited an equal number of participants from India, Pakistan, and outside of the region, the response rate from Pakistani participants was double that of Indian and non-South Asian participants. Despite these limitations, the survey provides valuable insights into how participants view the perceived risks and opportunities of EDTs in terms of their impact on crisis prevention and management in South Asia.

5 The definitions of each EDT can be found in Annex 2.

PART III.

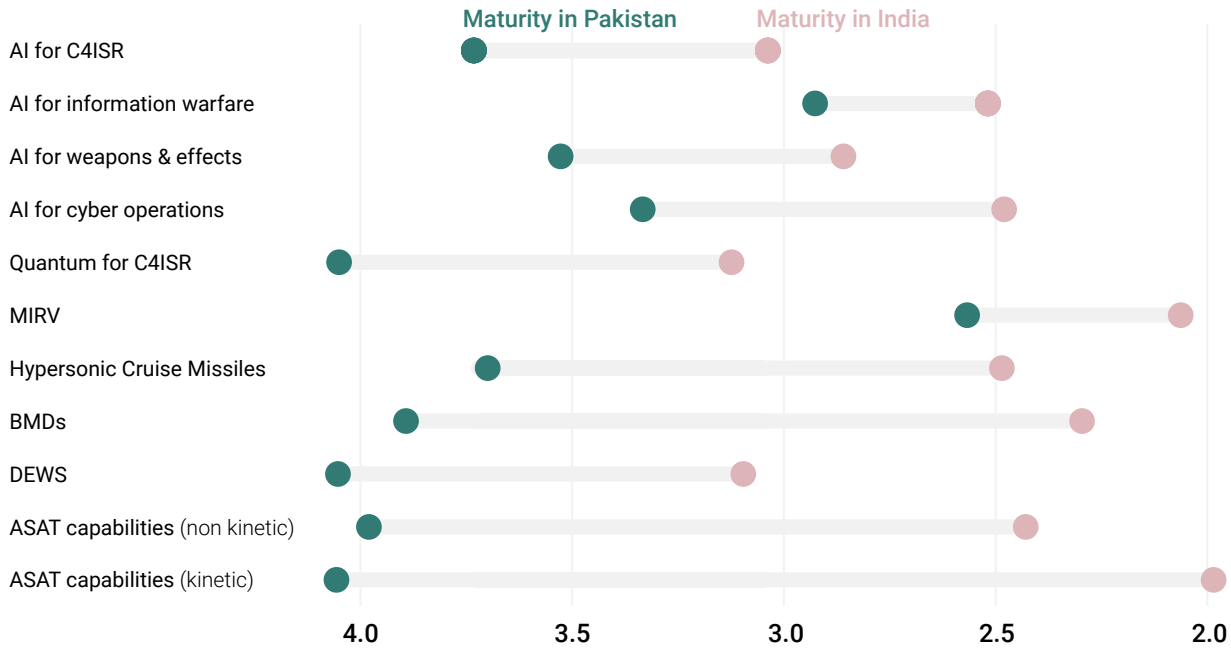
Findings

Maturity Gap

A significant trend that emerges from the data is that, in general terms, India is perceived to have achieved greater maturity in most of the EDTs assessed, compared to Pakistan. This trend is shared amongst the three groups. Within this dataset, the only technology which shows a divide amongst Indian and Pakistani participants is 'AI for Information Warfare' for which participants from both countries perceive the other country as being more advanced. Such findings will be discussed in the analysis section of the report.

The following figure shows maturity perception according to all survey respondents (Indians, Pakistanis, and non-South Asians).

Figure 1: Maturity of Emerging and Disruptive Technologies in India and Pakistan



When looking at the data of all participants together, India is perceived ahead with regard to all the EDTs surveyed. Some EDTs show a greater maturity gap between India and Pakistan, such as BMDs and ASAT capabilities, and empirical evidence does support that India is much more advanced than Pakistan in developing and integrating those capabilities.[6]

6 Jalil, G. Y. (2024) India's Pursuit of Missile Shield: Challenges and Implications for Pakistan. ISSI. https://issi.org.pk/wp-content/uploads/2024/08/IB_Ghazala_Aug_8_2024.pdf; DRDO (2019) Mission Shakti. https://drdo.gov.in/drdo/mission-shakti

However, it is important to note that for some EDTs, the gap could be explained by the fact that in Pakistan, there is not as much publicly available information with regard to the development of EDTs on the military and strategic level than there is in India. Hence, the gap of maturity could also be explained as a gap of information.

EDTs Impact on India-Pakistan Crisis Prevention and Management

The two following tables show how the different groups (Indian, Pakistani, non-South Asians) scored EDTs with regards to their perceived impact on existing India-Pakistan crisis prevention and management mechanisms. The closer the score is to 1, the more negative the impact of the technology is perceived to be. The closer to 7, the more positive the impact of the technology is perceived to be. In the following two tables, darker shades of red indicate a stronger negative impact, white represents neutral or mixed results, and darker shades of green signify a more positive impact. The data is structured to show how each EDT's impact on crisis prevention and management is perceived differently across the diverse expert groups, reflecting a spectrum of opinions.

Figure 2: EDTs Impact on Crisis Prevention

	Indian Respondents	Pakistani Respondents	Non-South Asian Respondents
AI for C4ISR	4.0	4.0	3.8
AI for information warfare	2.8	2.6	2.5
AI for weapons and effects	3.4	2.9	2.9
AI for cyber operations	3.1	3.1	3.4
Quantum for C4ISR	4.5	4.6	4.6
MIRV	3.8	3.7	3.1
Hypersonic Cruise Missiles	3.6	2.3	3.5
BMDs	4.1	3.1	3.7
DEWS	3.9	3.6	3.7
ASAT capabilities (non kinetic)	3.5	2.6	3.5
ASAT capabilities (kinetic)	3.4	2.6	3.3

With regard to crisis prevention, most technologies were perceived to have a negative impact (identified in red in the table), and very few technologies were perceived as having a neutral or mixed impact (white) or a positive impact (green). Previous work conducted by BASIC in South Asia over the past few years seems to confirm this perception that very few technologies are perceived to help prevent crises, and are rather perceived as a risk, potentially participating in the creation or worsening of crises. For example, the possible disruption of deep fake technology—a subset of AI for information warfare—has often been highlighted as potentially fuelling tensions in the South Asian context.[7]

7 Akhtar, R. and Neog, R. (2023) Conclusion: Tu Tu-Main Main: Policy, Scholarship, and India-Pakistan Communications in Crisis Communications: Indian and Pakistani Perspectives on Responsible Practices. https://basicint.org/wp-content/uploads/2023/06/Compendium_FINAL.pdf

Similarly, the use of AI technologies in all domains (cyber operation, information warfare, weapons and effects) was seen as potentially increasing the risks of misperceptions and misunderstanding, and participants to previous BASIC workshops have identified this technology as a potential vector to crises.[8]

Amongst all the EDTs assessed, quantum for C4ISR appears as a clear stand out, perceived quite positively across all groups, suggesting a consensus on its potential beneficial impact in aiding crisis prevention. In contrast, AI for information warfare received lowest scores overall, reflecting the general view that this EDT is perceived to have an extremely negative impact on crisis prevention.

Figure 3: EDTs Impact on Crisis Management

	Indian Respondents	Pakistani Respondents	Non-South Asian Respondents
AI for C4ISR	3.8	4.0	3.7
AI for information warfare	3.1	3.1	3.0
AI for weapons and effects	3.3	3.2	3.5
AI for cyber operations	3.4	3.5	3.3
Quantum for C4ISR	4.7	4.2	4.8
MIRV	3.6	3.5	3.5
Hypersonic Cruise Missiles	3.4	2.5	3.2
BMDs	4.0	3.3	3.8
DEWS	3.7	3.0	3.5
ASAT capabilities (non kinetic)	3.2	2.3	3.1
ASAT capabilities (kinetic)	3.3	2.5	2.9

With regard to crisis management, across all three groups, a similar assessment as the one made for crisis prevention can be made. Most technologies were perceived to have a negative impact on crisis management, whilst quantum for C4ISR is again rated quite positively by all groups, showing consistency in its perceived beneficial impact across both crisis prevention and crisis management. Meanwhile, technologies such as AI for information warfare, AI for cyber operations, and hypersonic cruise missiles are rated more critically, indicating that experts who have responded to the survey view them as having worse impacts on crisis management than on crisis prevention.

When comparing the data from Figure 2 to the one of Figure 3, several observations emerge:

- **Consistency of Technology Perception:** quantum for C4ISR's impact is perceived positively across both crisis prevention and crisis management by all groups. This consistency suggests a strong consensus about the constructive role this technology can play in both areas.
- **Crisis Prevention and Crisis Management Differences:** some technologies' scores tend to have a slightly worse impact on crisis prevention compared to their impact on crisis management. For example, AI for weapons and effects and AI for cyber operations are seen as having a more negative impact on crisis

8 Cervasio, C., Wheeler, N. J. and McClafferty, M. (2024) Crisis Prevention and Management in South Asia: Mutual Confidence, Risk, and Responsibility. https://basicint.org/wp-content/uploads/2024/04/Crisis-Prevention-and-Management-in-South-Asia.pdf

prevention than on crisis management. For another subset of technologies, they are seen as having a worse impact on crisis management than on crisis prevention, such as ASAT capabilities and DEWs.

- **Divergence in Group Perspectives:** The difference in scores between Indian, Pakistani, and non-South Asian respondents remains visible in both datasets, with the Pakistani group having a generally more negative outlook on EDTs' impact than the Indian and non-South Asian group.

Overall, the comparison highlights that while some technologies like quantum for C4ISR are consistently viewed as beneficial, other EDTs are seen as more complex, some affecting more crisis prevention, other more crisis management, and some having a negative impact in both domains, reflecting different expectations and concerns depending on the specific context of either preventing or managing a crisis.

The Defence Research and Development Organisation (DRDO) successfully launched the Ballistic Missile Defence (BMD) Interceptor missile, in an Anti-Satellite (A-SAT) missile test 'Mission Shakti' engaging an Indian orbiting target satellite in Low Earth Orbit (LEO) in a 'Hit to Kill' mode from the Dr. A.P.J. Abdul Kalam Island, in Odisha on March 27, 2019.

The difference in scores between Indian, Pakistani, and non-South Asian respondents remains visible in both datasets, with the Pakistani group having a generally more negative outlook on EDTs' impact than the Indian and non-South Asian group.

PART IV.

Analysis

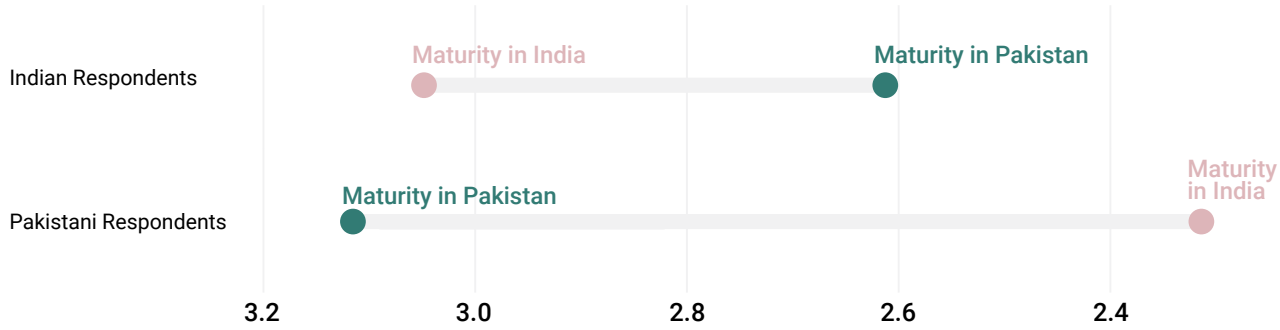
Four key observations emerge from the survey data.

First, AI for information warfare appears as the most controversial EDT with regard to maturity level with both Indian and Pakistan respondents perceiving the technology more mature in the other country. This perception stems largely from the inherently negative view of AI's role in information warfare. Second, there is a 'Maturity-Perception Effect', in which overall, the more mature a technology is, the more disruptive it is perceived with regard to crisis prevention and management when looking at the data from all participants. Third, the data shows a potential bias, wherein nationals from the country that possesses and is developing the EDT tend to view it more favourably than those from a country where a technology is less developed. This may explain why Indian participants consistently rated EDTs more positively than their Pakistani counterparts. Finally, the report seeks to explore why quantum technology for C4ISR is seen by all groups as having the potential for a positive impact on crisis prevention and management.

AI for Information Warfare

There are contrasting perceptions between Indian and Pakistani participants regarding the maturity of AI for information warfare. Pakistani participants view this technology as more mature in India than in Pakistan. Conversely, Indian participants perceive AI for information warfare as more mature in Pakistan than in India. This mutual perception of the other nation having greater maturity is unique in the eleven EDTs assessed.

Figure 4: Maturity of AI and Information Warfare



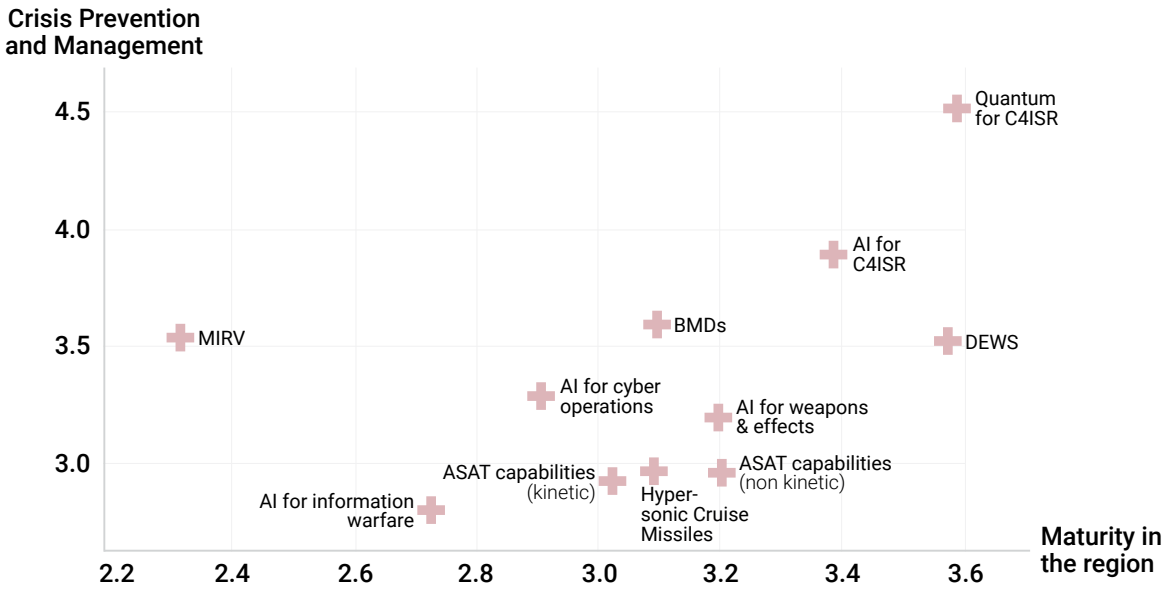
This can be attributed to the inherently negative connotations associated with AI in the context of information warfare, compared to the other EDTs assessed, which often have positive connotations. Whilst technologies like MIRV or ASAT are often a sign of prestige, and such capabilities are showcased by countries, AI for information warfare capabilities is not something that countries do highlight. AI for information warfare is often associated with tactics such as misinformation, psychological operations, and the manipulation of public opinion, all of which are viewed negatively because they can be used to deceive or destabilise

opponents, rather than to strengthen stability. Indeed, both countries have often criticised the other for using information warfare against themselves.[9]

Maturity-Perception Effect

A trend that emerged from the dataset from all participants is a correlation between maturity and perception. This correlation, or Maturity-Perception Effect, refers to the phenomenon where participants seemingly perceive mature EDTs more negatively compared to newer, less developed technologies. As EDTs mature and become more integrated into national defence frameworks, participants tend to view them with increased scepticism, focusing on their destabilising effects and potential risks to regional security.

Figure 5: EDT's Impact on Crisis Prevention and Management and Maturity in the Region



The Maturity-Perception Effect underscores the shifting nature of how EDTs are viewed by South Asian and non-South Asian participants. When technologies are nascent, they often seem to inspire hopes for innovation and enhanced deterrence. However, as these technologies mature and their strategic applications expand, respondents increasingly focus on the negative consequences—such as arms races, crisis instability, and the erosion of deterrence—leading to more pessimistic assessments of their long-term impact on regional stability.

It is however important to note that on that specific data set, MIRV technology appears as an outsider, which despite its maturity, is not seen as having as much of a negative impact as the other developed technologies. According to several participants of the survey, MIRV can be viewed as a damage-limitation strategy and a saving-face strategy, as coupled with BMDs could allow both sides to save face in a crisis. However, it could be argued that such a rating could be attributed to the fact that out of all the EDT surveyed, the perceived maturity gap between India and Pakistan is the smallest for MIRV technology (outside of AI for information), and according to the dataset, is the most developed EDT in Pakistan, and almost the most developed EDT in India. Thus, it could be argued that MIRV does not follow the Maturity-Perception Effect, because both states are almost at parity in its testing, development, and integration, and thus, strategic stability is maintained.

9 Iqbal, R. (2022) Information War: India's Disinformation Campaign Against Pakistan. CISS. Available at: https://ciss.org.pk/information-war-indias-disinformation-campaign-against-pakistan/; Barthwal, N. (2022) Information Warfare and India's Level of Preparedness https://www.claws.in/information-warfare-and-indias-level-of-preparedness/

This image depicts a missile test of Agni-V in 2013, which is not MIRV equipped in this instance. However, in 2024, India successfully tested a MIRV-equipped Agni-V missile.

> ***Rather than offering purely objective assessments of a technology's impact on crisis prevention or management, respondents' views are maybe coloured by their own country's strategic position in relation to that technology.***

Strategic Bias

Another interesting trend that has emerged in the survey responses is a possible bias for certain technologies, when comparing responses from Indian and Pakistani participants when there is a proven and clear maturity gap between India and Pakistan. With regard to EDTs that only India possesses and/or has tested, Indian participants perceive the technology much more positively than their Pakistani counterparts—though Indian participants still generally assessed this category of technologies as having an overall negative impact on crisis prevention and management.

For instance, India has made significant strides in developing ASAT, BMDs, and hypersonic technologies, including its *Mission Shakti* in 2019,[10] which demonstrated India's kinetic ASAT capability. In contrast, Pakistan lacks comparable ASAT capabilities, which likely influenced the more critical view expressed by Pakistani respondents. Similarly, India's ballistic missile defence programme[11] and hypersonic weapons development[12] are much more advanced than those in Pakistan, possibly explaining why Indian respondents were more inclined to see these technologies not contributing as negatively to crisis prevention and management.

10 DRDO (2019) Mission Shakti. https://drdo.gov.in/drdo/mission-shakti

11 The Hindu Bureau (2024) DRDO successfully tests Phase-II ballistic missile defence system. The Hindu. https://www.thehindu.com/sci-tech/science/drdo-successfully-tests-phase-ii-ballistic-missile-defence-system/article68442838.ece

12 Tripathi, P. (2024) How hypersonic weapons are redefining warfare. ORF. https://www.orfonline.org/expert-speak/how-hypersonic-weapons-are-redefining-warfare

This potential bias must be considered when interpreting the data, as it highlights how national interests and access to technologies can shape expert opinions. Rather than offering purely objective assessments of a technology's impact on crisis prevention or management, respondents' views are maybe coloured by their own country's strategic position in relation to that technology. In a sense the data seems to show that for participants, EDTs rarely have an inherent positive or negative impact on crisis prevention and management, rather their impact is perceived in relation to whether a country has developed said technology, and whether the adversarial state possesses it as well.

Quantum for C4ISR: A Hopeful Horizon?

Quantum technology for C4ISR emerges as a notable exception amongst the technologies assessed, with the three groups of participants acknowledging its potential to positively impact India-Pakistan crisis management and prevention.

The promise of quantum technology lies in its ability to improve ISR through quantum sensing. If successfully integrated, quantum sensing applications could help ISR in GPS-denied environments, or could improve air-based ISR through cloud cover and smoke.[13] Additionally, quantum sensors could also enable military personnel to detect underground structures or nuclear materials.[14] Furthermore, quantum technology could strengthen communication, as it promises to enable ultra-secure communication, sometimes referred to as 'unhackable', and thus could help prevent interception from adversaries.[15]

However, as highlighted earlier with the Maturity-Perception Effect, the current lack of maturity of this technology means that its possible positive impact on crisis prevention and management is potentially explained by the lack of maturity of this technology in South Asia. As the technology will begin to be developed in either or both of the countries, people might see the technology with much more scepticism and focus on the destabilising effects, such as quantum computers capability to potentially decrypt classified information stored on encrypted media, or the deployment of quantum sensors that would lead to significant improvements in submarine detection.[16]

And as highlighted with the Strategic Bias effect, this positive view of quantum for ISR is also potentially explained by the fact that neither India or Pakistan are close to having it integrated into their military, and are therefore at parity. Therefore, it could be that as soon as one of the two states makes a significant stride in quantum technology, it is likely to be seen much more negatively by the other state.

13 Parker, E. (2021) Commercial and Military Applications and Timelines for Quantum Technology. RAND. https://www.rand.org/pubs/research_reports/RRA1482-4.html

14 Sayler, K. M. (2024) Defense Primer: Quantum Technology. Congressional Research Service. https://crsreports.congress.gov/product/pdf/IF/IF11836

15 Parker, E. (2021) Commercial and Military Applications and Timelines for Quantum Technology.

16 Ibid.

ANNEX 1

List of Survey Questions

1	To what extent do you think this technology / or development of this technology could provoke or deter an adversary from initiating an attack?
2	To what extent do you think this technology / or development of this technology can exacerbate or reduce misperceptions between conflicting parties, leading to a crisis?
3	To what extent do you think this technology can erode or strengthen nuclear command, control, and communications (NC3)?
4	To what extent do you think this technology can erode or strengthen existing channels of communication in a crisis?
5	To what extent do you think this technology can exacerbate or reduce misperceptions between conflicting parties during a crisis?
6	To what extent do you think this technology can reduce or increase decision-making time during a crisis?
7	How advanced do you think the development of this technology is in India?
8	How advanced do you think the development of this technology is in Pakistan?
9	Do you think there are any financial, legal, political or structural barriers preventing this technology from developing in India?
10	Do you think there are any financial, legal, political or structural barriers preventing this technology from developing in Pakistan?

ANNEX 2

EDTs Definitions Given to Participants of the Survey

Technologies	Definition
AI for C4ISR	AI for C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance) refers to the application of artificial intelligence technologies to enhance the capabilities and efficiency of C4ISR systems. By integrating AI, these systems can achieve improved data processing, decision making, and operational effectiveness.
AI for information warfare	AI for information warfare refers to the use of AI technologies in the context of influencing information or perceptions in conflicts or strategic situations. This includes various methods such as automated campaigns that disseminate information widely across social media to shape public opinion or impact perceptions, utilising techniques like deep fakes, data mining, etc.
AI for weapons and effects	AI for weapons and effects involves integrating artificial intelligence technologies to enhance the capabilities, precision, and effectiveness of various weapons systems. By leveraging AI, these systems can achieve advanced targeting, decision-making, and autonomous operation, significantly increasing their operational efficiency and impact. This notably includes unmanned aerial vehicles (UAVs), unmanned ground vehicles (UGVs), coordinated drone swarms, missile defence systems, and AI-powered naval operations.
AI for cyber operations	AI for cyber operations involves the use of artificial intelligence technologies to enhance cyber capabilities through advanced capabilities in threat detection, intrusion prevention, vulnerability assessment, incident response, and cyber attack execution.
Quantum for C4ISR	Quantum for C4ISR refers to the integration of quantum technologies within Command, Control, Communication, Computers, Intelligence, Surveillance, and Reconnaissance systems. These technologies harness principles of quantum mechanics to enhance capabilities in secure communication, precise sensing, efficient computing, and improved detection and navigation systems, thereby having the potential to strengthen military and intelligence operations.
Multiple independently targeted re-entry vehicle (MIRV)	Multiple independently targeted re-entry vehicle (MIRV) is an exoatmospheric ballistic missile payload that carries several warheads, each capable of being independently aimed to hit different targets. This capability enhances the missile's effectiveness by allowing it to strike multiple targets simultaneously or saturate missile defences.

Technologies	Definition
Hypersonic cruise missiles	Hypersonic cruise missiles are advanced weapons that combine the speed of hypersonic flight (exceeding Mach 5) with the manoeuvrability of cruise missiles. They are designed to travel at extremely high speeds while maintaining the ability to change trajectory and altitude, making them difficult to detect and intercept. Hypersonic cruise missiles are considered strategic assets due to their speed, manoeuvrability, and ability to penetrate advanced defence systems. Their development, acquisition and stockpiling are a focus for many nations seeking to enhance their military capabilities.
Ballistic Missile Defence (BMD)	Ballistic Missile Defence (BMD) Systems are advanced technologies and strategies designed to detect, track, intercept, and destroy incoming ballistic missiles before they can reach their intended targets. They involve a complex integration of radar, command and control, and interceptor technologies, and operate across various phases of a missile's flight. These systems aim to protect against the threats posed by ballistic missiles, which can carry conventional as well as nuclear warheads. Whilst BMD systems were primarily designed for ballistic missiles, some modern BMD systems are also equipped to detect and track cruise missiles.
Direct Energy Weapons (DEWs)	Direct Energy Weapons (DEWs) emit highly focused energy in the form of lasers, microwaves, or particle beams. Unlike conventional weapons that rely on the kinetic energy projectiles (such as bullets and missiles), DEWs use directed energy to disable or destroy their targets. Examples of DEWS include high-energy lasers (which use focused laser beams to burn through or disable targets, such as missiles, drones, or electronics) or high-power microwave weapons (which emit electromagnetic energy to disable electronic systems, e.g. communication networks, computer systems, or other sensitive electronics).
Non-kinetic anti-satellite (ASAT) capabilities	Non-kinetic anti-satellite (ASAT) capabilities refer to methods of disabling or disrupting satellites without physically destroying them. These capabilities focus on electronic, cyber, or other non-destructive means to achieve strategic objectives. Some examples of non-kinetic anti-satellite capabilities include signal jamming (which involves emitting radio satellite communications or navigation systems, disrupting their operations) or spoofing (which involves manipulating signals or data to mislead recipients or systems into believing false information).
Kinetic anti-satellite (ASAT)	Kinetic anti-satellite (ASAT) capabilities refer to methods and technologies designed to physically destroy satellites or render them inoperable through direct impact. Examples of kinetic ASAT capabilities include direct-ascent missiles (which are launched from the ground to intercept and collide with satellites in orbit), co-orbital kinetic kill vehicles (which involves deploying satellite or spacecraft into orbit with the purpose of manoeuvring close to a target satellite and physically destroying it), and space mines or debris (which involves deploying small objects or debris into orbits where they can pose a collision risk to enemy satellites).

BASIC promotes meaningful dialogue amongst governments and experts in order to build international trust, reduce nuclear risks, and advance disarmament.

The British American Security Information Council (BASIC)
Work + Play
111 Seven Sisters Rd
Finsbury Park
London N7 7FN