

# TECHNOPOLITIK

How should India navigate technology geopolitics?



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## INTRODUCTION

Rapid technological changes in the last few years have added a twist to geopolitics defined by great power rivalry between the US and China. This rivalry increasingly spills into the AI domain. On the one hand, the US is impeding Chinese progress by resorting to export restrictions for AI hardware and software. Chinese companies such as DeepSeek and Tencent, on the other hand, are challenging the very basis of US dominance by open-sourcing their AI models. In the space domain, the US and China have been embroiled in an intense race that spans satellite internet, space stations, Moon and Mars. Mars.

Contemporary technology geopolitics not only involves great powers attempting to outpace the other in various technology domains — from AI to biotech and from aerospace to quantum — but also touches the very fabric of global supply chains. Following Israel's pager attack in Lebanon and the US proposing rules to ban Chinese connected car technology in September 2024, there has been a shift in how global supply chains are conceptualised and operationalised. Concerns around supply chain security were suddenly heightened, with researchers, traders, and policymakers all struggling to frame a response to it.

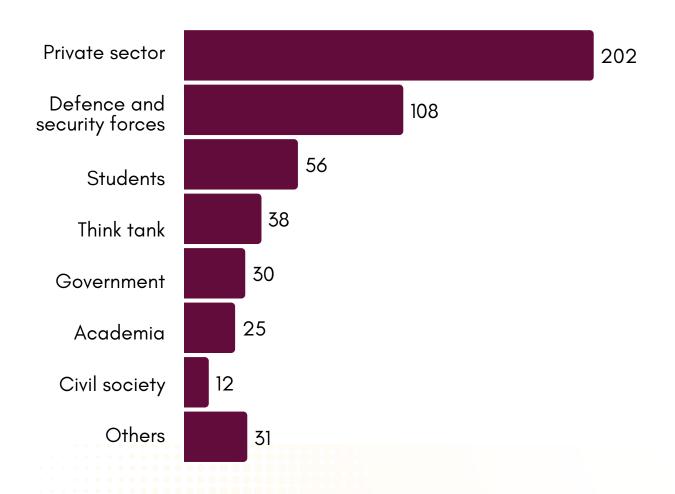
Technology geopolitics and supply chain security concerns not only affect great powers but also alter the calculations of rising and aspirational developing countries such as India. The question animating Indian policymakers is how India should navigate high-tech geopolitics and secure its supply chains in a way that is in the country's interests.

This broad question spawns many specific questions, such as: Should India prioritise indigenous development of technology or partner closely with the US or China? Should India build a semiconductor fab or just focus on design? Does technology play the most crucial role in determining India's power in the next decade?

Even as policymakers struggle to frame their responses to these questions, what do Indian people think about how India should navigate high-tech geopolitics? The 'Technopolitik: A Technology Geopolitics Survey', a public survey conducted by the researchers of the High-Tech Geopolitics Programme of the Takshashila Institution, attempts to address these issues. The survey's findings may serve as a valuable guide to Indian policymakers and other stakeholders, such as private sector actors.

The Technopolitik survey accepted responses from the public (in a non-scientific manner with no sampling involved) for two months (November-December 2024). The survey asked a total of 10 questions, which ranged from broad-based themes such as technology power and partners to specific ones on technology domains such as semiconductor and Al. The options in the 10 questions were chosen, wherever possible, with the idea of keeping them mutually exclusive and exhaustive. The motivation was to inspire the respondents to think deeply about the options; hence, easy choices were negativated during the designing phase of the survey.

The survey received 502 responses in total from a diverse group of stakeholders. The private sector (202 responses) constituted the major portion (40.2%), followed by defence and security forces (108 responses or 21.5%). The survey was anonymous and respondents were only asked to identify which stakeholder group they belonged to. The stakeholder distribution is highlighted below:





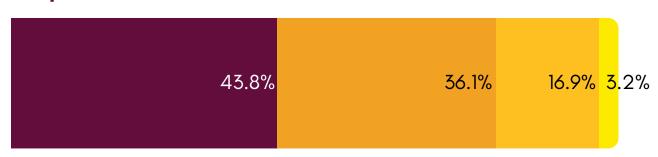
# PRIMARY INSIGHTS

## Technology collaboration over "Atmanirbharta"

#### Question 1

What should be India's highest priority for technology development in the next decade?

### Responses



- India should collaborate with the US, UK and France.
- India should develop indigenous technology.
- Let the private sector set technology procurement policy.
- Buy the latest technology from other countries.

Which pathway to adopt for technology development is a question that has confronted Indian policymakers time and again. Prime Minister Modi attempted to answer it in favour of self-reliance by calling for atmanirbharta during his 2020 Independence Day speech. Recently, this question has been playing out over the fifth-generation stealth fighters the Indian Air Force seeks to acquire. Should India continue with the existing ambitious programme of building indigenously a 5.5 gen stealth Advanced Medium Combat Aircraft (AMCA) or acquire an F-35 from the Americans or a Su-57 from the Russians? Or co-develop and co-produce advanced aircraft? Going by the survey findings, in the case of stealth fighters, the Indian government should choose between indigenous AMCA and co-development/co-production of next-gen aircraft.

When asked what India's highest priority for technology development in the next decade should be, the respondents chose collaboration over atmanirbharta. 43.8% of respondents believe India should collaborate with the US, UK and France for rapid technological development. 36.1% echo the atmanirbharta viewpoint and believe that India should develop indigenous technology even if it is not the best in class. This demonstrates that while the majority favour collaboration, the autarky view still remains significant. There is also a tiny strand that does not want the Indian state involved in dictating technology development priorities. 16.9% of respondents believe the Indian government should not play a role and let the private sector set technology procurement policy based on prevailing market scenarios. Only a miniscule 3.2% are in favour of buying technology from other countries.

## Economic power over all

#### **Question 2**

Rank the five factors based on their contribution in determining India's national power in the next decade.

### Responses

Rank\*

- 1 Economic Power
- 2 Technological Power
- 3 Military Power
- 4 Human/Talent Power
- 5 Soft Power

#### \*Methodology

Respondents were asked to rank each power based on their contribution in determining India's national power. Rank one being highest preference, and rank five being lowest. Cumulative ranking is obtained by adding all the ranking shared by respondents; power with lower summation is ranked higher.

Various components define a country's comprehensive national power. Historically, military strength was identified as the most critical component, but this underwent flux in the 21st century as the utility of hard military power declined amid technological and information geopolitics.

When respondents were asked to rank military, technology, soft, economic and human/talent power based on their contribution to determining India's national power in the next decade, it was therefore expected that military power would score low. Only 14.1% of respondents chose military power as their first preference. Only soft power scored lower than military power (13.5% first preference). Interestingly, even the "government" stakeholder ranked military power low, as only 10% from that group chose it as their first preference.

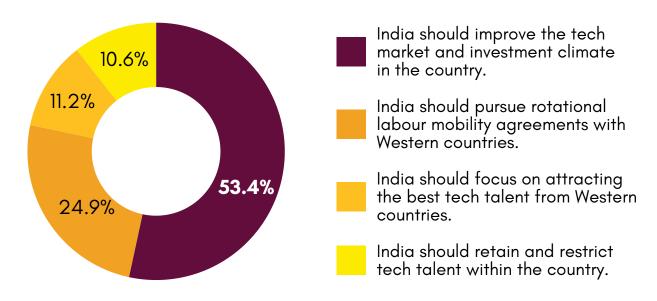
One clear takeaway from the responses was that the majority chose economic power as their first preference (35.6%). Another insightful finding was that talent power scored higher (21.7%) than technological power (14.9%) for the first preference slot. This underscores the rising importance of technology talent in deciding the winners and losers of high-tech geopolitical contestations.

## Let the talent decide

#### **Question 3**

In the context of geopolitics of tech talent, what should India prioritise?

### Responses



The survey findings reveal a counterintuitive insight on the issue of technology talent. For decades, India has been an exporter of high-tech talent to the US, UK and Europe. This technology talent has not just helped build, but also leads some of the most advanced technology companies in the West. At the same time, there has been some backlash against immigrants in Western countries, even as they are facing a demographic decline. This has led some, most notably Lant Prichhet, to propose rotational labour mobility as a solution India could pursue. Rotational labour mobility would involve talent temporarily relocating to Western countries and then returning back to India.

But should India even let its talent migrate to the US and elsewhere? Especially so in the face of mounting supply chain warfare and technological rivalry between the US and China that doesn't necessarily advantage India?

The respondents are overwhelmingly clear: let the talent decide. 53.4% believe that India should not focus on technology talent (internal or external) but rather on the country's technology market and investment climate. 24.9% believe that India should pursue rotational labour mobility agreements that allow India's technology talent to temporarily relocate to Western countries. However, when the "government" stakeholder group is looked at in isolation and compared with the overall figures, there appears to be an equal divide between the aforementioned two options (36.7% each). This means there are more takers for the rotational labour mobility arrangements among the government stakeholder group.

Further, only 10.6% want to retain and restrict technology talent within the country, while 11.2% want India to attract the best technology talent from Western countries.



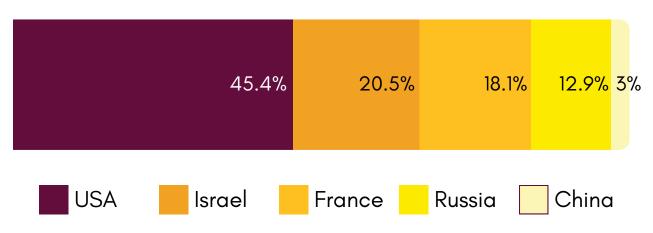
# **TAKEAWAYS**

# Critical technology partners: Rising Israel, declining Russia

### **Question 4**

In the current geopolitical landscape, which state should be India's key partner for critical technologies, including defence?

### Responses



For most of independent India's history, the country did not have a good relationship with the US. From supporting Pakistan during the Cold War to excluding India from multilateral export control regimes even after the end of the Cold War, the US was not looked at favourably by the Indian elite and masses alike. That began to change with the nuclear agreement of 2005 and a bipartisan commitment to the US-India relationship, including in the domain of critical technologies. Notwithstanding the growing strategic partnership, pockets of deep suspicion of America remain only to surface sporadically — for instance, in the aftermath of the Russia-Ukraine war.<sup>7</sup>

It would be reassuring for the US that most respondents (45.4%) chose the US as India's key partner for critical technologies, including defence, in the current geopolitical landscape. The historically reliable partner of India — Russia (12.9%) — has been eclipsed by newer ones such as Israel (20.5%) and France (18.1%). A miniscule 3% chose China.

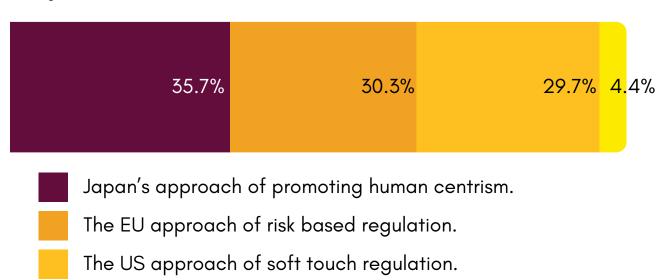
Stacking overall figures against the stakeholder group "defence and security forces" reveals that the latter prefer Israel (35.2%) over the US (31.5%) as the most preferred partner. Further, for the aforementioned stakeholder group, Russia (19.4%) also eclipses France (12%). This variation of figures for this stakeholder group — primary user of critical defence technologies — reveals an affinity for Israeli technologies as well as a continued dependence on Russia.

# A divided house on Al governance

#### **Question 5**

There are multiple ways to approach AI regulation. Which one should India choose?

### Responses



China's approach of having the government in the driving seat.

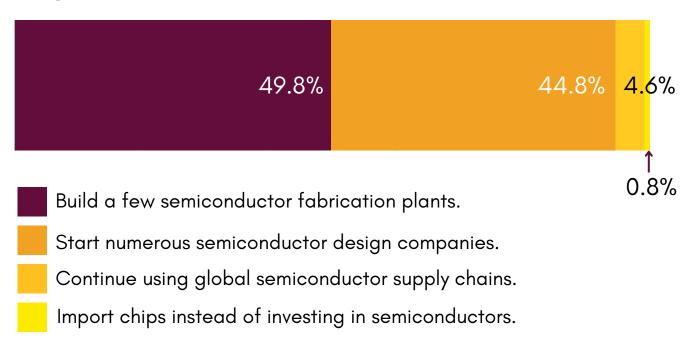
India's position on AI governance in the last few years has not been discernible. The survey findings indicate why this might be the case. When asked about which approach to AI regulation India should adopt, the respondents were divided among the US approach of light touch regulation (29.7%), the EU approach of risk-based regulations (30.3%) and Japan's approach of human centrism and spreading AI education and literacy (35.7%). Only a minuscule 4.4% advocated the Chinese approach of the government being in the driving seat while promoting economic prosperity. This finding implies that India's approach to AI governance in the coming years may continue to be a composite of all the approaches identified above.

# Build or design, but do something about chips

#### **Question 6**

What should be the Indian government's first priority in the semiconductor domain to enhance its technological capabilities and economic growth in the next decade?

### Responses



While the respondents are divided on the question of AI regulation, there is a clear majority view on semiconductor chips (which drives progress in cutting-edge AI). As the chip war heats up globally, close to 95% of the respondents believe India should do something about chips domestically. 44.8% would like India to start numerous semiconductor design companies to capitalise on the country's IT and engineering talent. Another 49.8% would like India to build its own semiconductor fabrication plants. Indeed, this is what India has been attempting to do for at least the last couple of years.

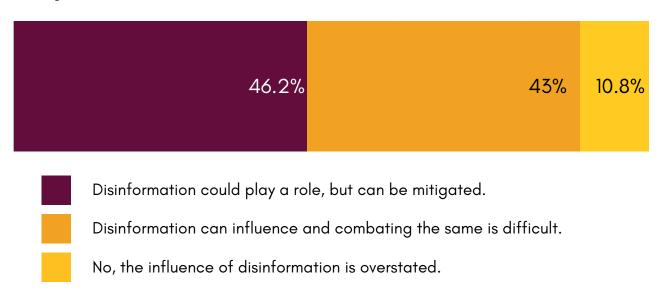
In early 2024, the Government of India approved a joint venture of Tata Electronics and Taiwan's Powerchip Semiconductor Manufacturing Corporation to build India's first fabrication facility in Dholera, Gujarat, involving an investment of INR 91,000 crores. They plan to build 28 nanometer (and above) chips, indicating a preference for trailing-edge chips to begin with instead of cutting-edge chips (the current cutting-edge is hovering around 2-3 nm). To

## Worry over disinformation

#### **Question 7**

Do you believe that foreign countries can influence Indian voters' decision-making during elections through disinformation campaigns?

### Responses



In the run-up to the 2024 general elections in India, Microsoft had warned about China's attempts to use AI-generated content on social media to influence elections. This only heightened concerns about external disinformation campaigns targeting Indian election processes.

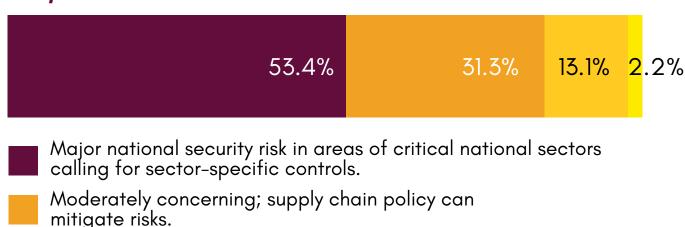
When asked about foreign countries influencing Indian voters' decision-making during elections through disinformation campaigns, an overwhelming majority expressed concern. But the respondents were divided over whether this could be tackled. 43% respondents believe combating disinformation campaigns is difficult. While 46.2% place faith in strong regulations and public awareness to mitigate the impact of disinformation campaigns.

## Nuanced supply chain security policy

#### **Question 8**

Given India's reliance on foreign-made hardware and software in critical sectors, how concerning is this in terms of cybersecurity?

### Responses



- Major national security risk calling for immediate controls on all foreign made hardware and software.
- Not concerning.

As discussed in the introduction section above, Israel's pager attack in Lebanon and the US proposing to ban connected car technologies linked to China inflamed supply chain security concerns. More recently, in January, the US announced export control rules for cutting-edge AI chips and divided the world into three tiers (with India in tier 2).<sup>12</sup>

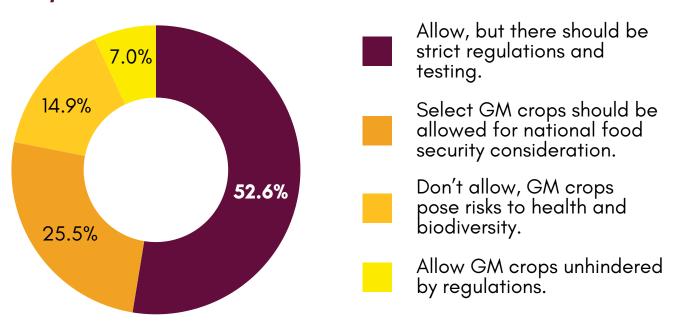
In such a scenario, given India's reliance on foreign-made hardware and software in critical sectors, how concerning is this in terms of cybersecurity? Only 13.1% called for a knee-jerk reaction of controlling all foreign-made hardware and software. Collectively, about 85% of respondents advocated a nuanced supply chain security policy for India. More specifically, 53.4% called for specific sector-based controls on foreign-made hardware and software. 31.3% called for a well-crafted supply chain policy and international cooperation to mitigate the risks.

## A qualified "yes" to GM crops

### **Question 9**

Do you think India should allow the adoption of genetically modified (GM) crops like mustard by Indian farmers?

#### Responses



India has had a chequered history with genetically modified (GM) crops. The only GM crop allowed in India for commercial use is Bt. cotton. It was approved in 2002 by the Genetic Engineering Appraisal Committee of the Ministry of Environment, Forest and Climate Change. More than 90% of cotton cultivation in the country is now done through Bt. cotton. But the success of Bt. cotton has been a singular one. Other modified seeds such as of rice, brinjal and mustard have not been approved. As *The Hindu* editorial puts it: "The dispute over GM crops is fundamentally ideological and less on the traditional agricultural yardsticks of yield and farm economics." The split in the two-judge bench of the Supreme Court of India while delivering a verdict on GM mustard in 2024 only reflected this divide. The

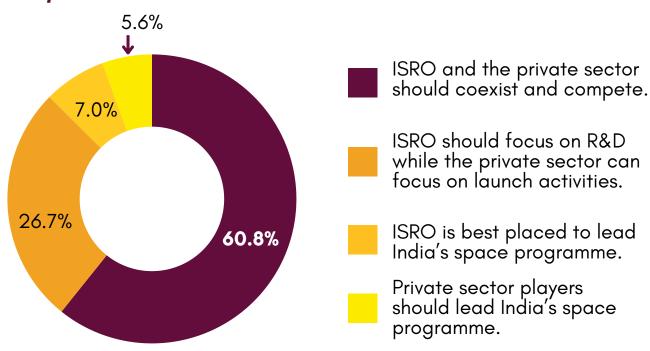
Contrary to current Indian realities, the respondents have given a qualified "yes" to GM crops. 52.6% agree that there should be strict regulations and testing for safety and environmental impact. 25.5% believe only select GM crops should be allowed for national food security consideration within specified geographical boundaries. 7% want to allow GM crops unhindered by regulations. Only 14.9% say no to GM crops because they pose risks to health and biodiversity and want the prioritisation of traditional farming methods instead.

# Resounding support to private sector in space

#### **Question 10**

What role do you envision for private companies in India's space sector?

#### Responses



For nearly five decades, the Indian Space Research Organisation (ISRO) was the Indian government's premier and only national space agency with a very limited role or involvement of the private sector. This changed in 2020 when the Indian government ushered in reforms and opened space for the private sector. To foster private sector participation, the government established the Indian National Space Promotion and Authorisation Centre (IN-SPACe). The 2023 Indian space policy gave a ringing endorsement to the private sector. The establishment of an INR 1000 crore venture capital fund for the space sector demonstrated the government's proreform intent. To

It is no surprise that when asked about the role the respondents envision for private companies in India's space sector, only 7% believed that the ISRO is best placed to lead India's space programme. 60.8% believed ISRO and the private sector should coexist and compete across all verticals and areas. 26.7% thought ISRO should focus on R&D while the private sector can focus on launch activities. That only 5.6% of respondents wanted the private sector players to lead India's space programme with rest advocating for some level of ISRO involvement reveals that the latter remains a central pillar of India's space programme.

## CONCLUSION

Amid intense geopolitical contestations by major powers that increasingly spills into the high-tech domain, the "Technopolitik: A Technology Geopolitics Survey" set out to find out what Indian people think about how India should navigate high-tech geopolitics. Based on an analysis of the responses by 502 respondents, some primary insights emerged.

First, economics triumphed over other factors. This reflected not just in respondents ranking economic power as the highest factor (first preference slot) determining India's national power in the next decade, but also when respondents advocated a nuanced supply chain security policy and provided support to the private sector in space activities.

Second, most respondents favoured technology collaboration instead of autarky, thereby demonstrating the limits of techno-nationalism. In terms of partners for critical technologies (including defence), the US emerged as the leader, closely followed by Israel. The survey reflected the declining preference for Russia as a key technology partner (except among the "defence and security forces" stakeholder group).

Third, the respondents indicated a clear understanding of the importance of talent and how it should be dealt with. 21.7% of respondents ranked talent in the first preference slot when asked about factors determining India's national power in the next decade. Additionally, respondents favoured letting the talent decide its migration patterns based on market and investment climate instead of restricting talent in the country or following a rational labour mobility arrangement.

The findings of the survey may serve as a valuable guide to both Indian policymakers as well as the different stakeholder groups. More specifically, policymakers may consider the respondents' bent towards the troika of economics, collaboration and talent while charting India's path in the arena of high-tech geopolitics.

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## **ANNEXURE**

This annex lists all the survey questions with their responses in percentages as well as absolute numbers. Please note that the questions in the survey form were in a different order than the one listed below. The ordering in the annex has been optimised to conform with the thematic structuring of this report.

**Question 1**: What should be India's highest priority for technology development in the next decade?

Options	Responses	Percentage
India should develop indigenous technology even if it is not the best in class.	181	36.1%
India should collaborate with the US, UK and France for rapid technological development.	220	43.8%
Buy the latest technology from other countries.	16	3.2%
The Indian government should not play a role and let the private sector set tech procurement policy based on prevailing market scenarios.	85	16.9%

**Question 2**: Rank the following five factors based on their contribution in determining India's national power in the next decade.

Options	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5
Military Power	71	109	129	109	84
Technological Power	75	138	142	94	53
Soft Power	68	62	69	88	215
Economic Power	179	123	92	67	41
Human/Talent Power	109	70	70	144	109

**Question 3**: In the context of geopolitics of tech talent, what should India prioritise?

Options	Responses	Percentage
India should pursue rotational labour mobility agreements that allow India's tech talent to temporarily relocate to Western countries.	125	24.9%
India should retain and restrict tech talent within the country for its own growth and needs.	53	10.6%
India should focus on attracting the best tech talent from Western countries.	56	11.2%
India should not focus on tech talent (internal or external) but rather focus on improving the tech market and investment climate in the country.	268	53.4%

**Question 4**: In the current geopolitical landscape, which state should be India's key partner for critical technologies, including defence?

Options	Responses	Percentage
USA	228	45.4%
Russia	65	12.9%
France	91	18.1%
Israel	103	20.5%
China	15	3%

**Question 5**: There are multiple ways to approach AI regulation. Which one should India choose?

Options	Responses	Percentage
The US approach of soft touch regulation that allows for innovation to bloom.	149	29.7%
The EU approach of risk based regulation where harmful AI applications are prohibited and others are regulated.	152	30.3%
China's approach of having the government at the driving seat while promoting economic prosperity.	22	4.4%
Japan's approach of promoting human centrism and spreading AI education and literacy.	179	35.7%

**Question 6**: What should be the Indian government's first priority in the semiconductor domain to enhance its technological capabilities and economic growth in the next decade?

Options	Responses	Percentage
Start numerous semiconductor design companies to capitalise on India's IT and engineering talent.	225	44.8%
Build a few semiconductor fabrication plants to boost domestic manufacturing.	250	49.8%
Do nothing and continue using global semiconductor supply chains.	23	4.6%
Import chips instead of investing in semiconductors.	4	0.8%

**Question 7**: Do you believe that foreign countries can influence Indian voters' decision-making during elections through disinformation campaigns?

Options	Responses	Percentage
Yes, foreign elements can influence Indian voters through disinformation and combating the same is difficult.	216	43%
No, the influence of disinformation on decision- making in Indian society is overstated.	54	10.8%
Disinformation could play a role, but strong regulations and public awareness can mitigate its impact.	232	46.2%

**Question 8**: Given India's reliance on foreign-made hardware and software in critical sectors, how concerning is this in terms of cybersecurity?

Options	Responses	Percentage
It is a major national security risk calling for immediate controls on all foreign-made hardware and software.	66	13.1%
It is a major national security risk in areas of critical national sectors calling for specific sector based controls on foreign-made hardware and software.	268	53.4%
Moderately concerning; a well-crafted supply chain policy and international cooperation can mitigate the risks.	157	31.3%
Not concerning; the benefits of using advanced foreign technology outweigh the risks.	11	2.2%

**Question 9**: Do you think India should allow the adoption of genetically modified (GM) crops like mustard by Indian farmers?

Options	Responses	Percentage
Yes, allow GM crops unhindered by regulations.	35	7%
Yes, but there should be strict regulations and testing for safety and environmental impact.	264	52.6%
Only select GM crops should be allowed for national food security consideration within specified geographical boundaries.	128	25.5%
No, GM crops pose risks to health and biodiversity, and traditional farming methods should be prioritised.	75	14.9%

**Question 10**: What role do you envision for private companies in India's space sector?

Options	Responses	Percentage
Private sector players should lead India's space programme.	28	5.6%
ISRO is best placed to lead India's space programme.	35	7%
ISRO and the private sector should coexist and compete across all verticals and areas.	305	60.8%
ISRO should focus on R&D while the private sector can focus on launch activities.	134	26.7%

## **ABOUT THE AUTHORS**



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