

MOVING THE NEEDLE

...the journey from policy to implementation...



JULY 2023



Dear readers,

India continues to take long strides on the path to development pan sectors and across the length and breadth of the country. While there are investments planned across the sectors in the country, both for existing demand as well as for anticipated demand, India's growth and development also make a strong case for inclusion into the top performing economies of the world. While steps are being taken to modernize legacy infrastructure areas, new and futuristic technologies are also being looked at with the same keenness and focus. And not just on the globe but beyond that in space as well. Developments in the global arena will continue to impact India (positive or negative) but as a country, the movement is clearly towards planning and absorbing every change – be it financial services or in healthcare or even when it comes to migration..

In our expert section, we have Mr Narayan Prasad sharing his thoughts on India's evolution in the space industry and how India can leapfrog towards becoming a global leader in space in the coming years.

We endeavour to cover above key areas in this edition of the now christened "Moving the Needle". The intent is to highlight and converse on the most critical topics in the most strategic sectors for India.



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Interview Series by Primus Partners

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01 – Policy Square

Policy Square | A Primus Partners initiative to understand the more fundamental questions in policy making

Primus Partners on 28th December 2021, launched **Policy Square**, in association with Businessworld.

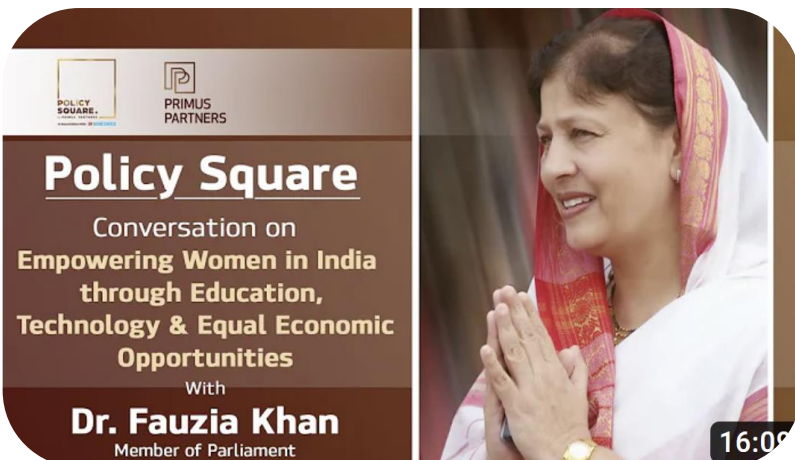
Policy Square, an initiative by Primus Partners, is a monthly expert interview series wherein key constituents of the public policy ecosystem – senior policy-makers, civil society members, business executives etc. – are interviewed on critical issues and

policies of national importance to explore their impact on the country and industry at-large.

The motivation for the Policy Square series is driven by Primus Partners' rich policy-regulatory knowledge, as well as experience of delivering projects across multiple sectors, with an aim to leverage this knowledge, and create a platform to table in – depth discourse.

With this initiative, we have attempted to engage with experts at various levels within the country's ecosystem. Each expert has brought in a new perspective – all towards enabling India's growth both in absolute and relative terms.

Latest episode features **Dr Fauzia Khan, Member of Parliament, Rajya Sabha**



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02 – Economy

Increasing capex is an indication of both existing as well as anticipated demand – not a case of either / or

Increasing capital expenditure by the government can be an indication of potential increasing demand. However, capital expenditure can also be driven by various factors such as technology upgrades, infrastructure improvements, regulatory compliance, or even strategic investments which does not automatically imply increasing demand. It is important to note that the Central Government has in the past taken several measures of promoting growth through increased productive capital spending which has stimulated demand and consumption in the economy. The capital expenditure-to-GDP ratio has increased to 2.7% in FY 2022-23 and is estimated to reach around 3.3% in this financial year, which is the highest ever capital outlay in India.

The government's focus on increasing capex has had a positive impact on the economy. The economy has grown at a faster rate in recent years and has helped to provide better infrastructure and services which is well supported with several plans to spur the sector's expansion such as- Gati Shakti, the National Single Window System, the National Monetization Plan, and the National Infrastructure Pipeline (NSWS).

Several measures have been adopted from time to time to increase the capital expenditure significantly, such as-

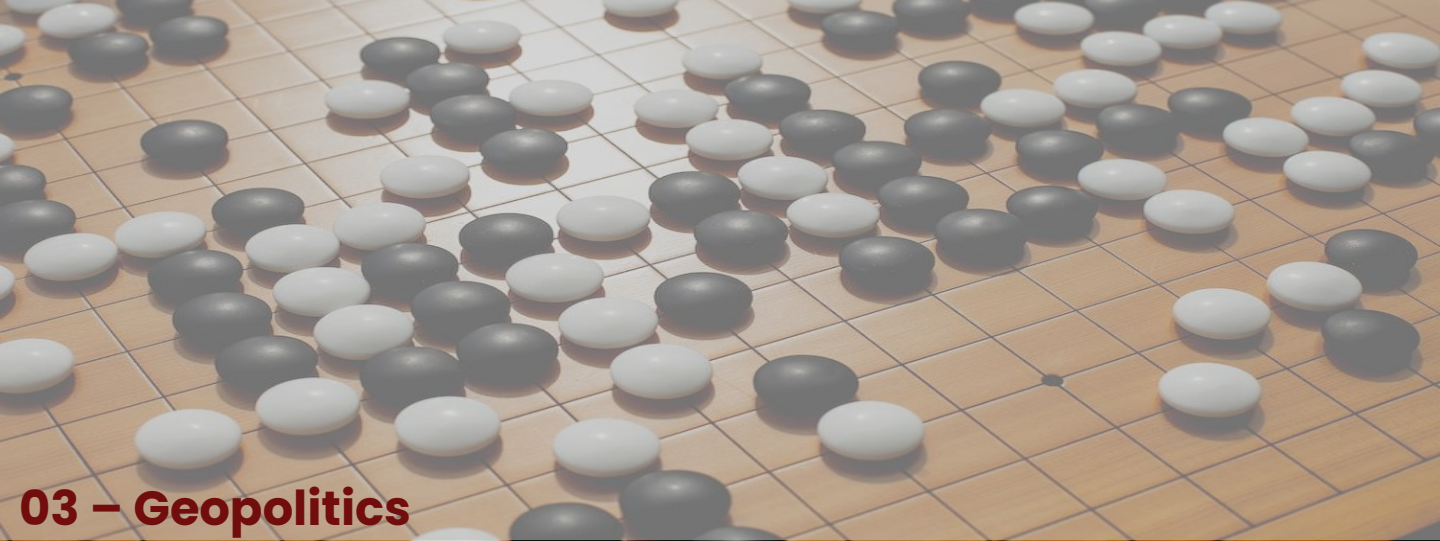
- 1. Increasing the budget allocation for capital expenditure:** The government has steeply increased the budget allocation for capital expenditure at 37.4% in BE 2023-24 (Rs. 10 trillion), which is a significant increase from the previous years. This will act as a catalyst to ramp the virtuous cycle of Investment and job creation.
- 1. Fast-tracking infrastructure projects:** Development of infrastructure has a multiplier effect on demand leading to its positive impact on employment, productivity, trade and consumer spending. Various projects have been

fast tracked and inaugurated such as opening of 15 National Highway Projects worth INR 13,585 crore in Bihar, Bharatmala Pariyojana, Narmada Valley Development Project, Chenab River Railway Bridge, Delhi Metro Industrial Corridor, Mumbai Trans Harbour Link, Inland Waterways Development Project etc.

- 1. Promoting public-private partnerships:** The government has promoted public-private partnerships (PPPs) which allows the government to leverage private sector expertise and capital to deliver infrastructure projects more quickly and efficiently.
- 1. Providing financial assistance to state governments-** The government has provided financial assistance to state governments which has been used to fund infrastructure projects, such as roads, schools, and hospitals. The Central Government has continued with its 50-year interest free loans to state governments to spur investment in infrastructure.

Additionally, the Indian economy has shown resilience in the face of global economic challenges, including the COVID-19 pandemic, and shown strong policy measures amid the slowing global growth and elevated commodity prices. The impact of government capital expenditure on demand varies depending on the overall economic conditions of the economy, policy objectives, and the effectiveness of the investments made.

Thus, while capex is a positive sign, it doesn't guarantee increasing demand on its own. The Indian government's focus on increasing capital expenditure is likely to continue in the coming years. This is because the government sees capex as a key driver of economic growth. By investing in infrastructure, the government can create jobs, boost demand, and improve the quality of life for Indians.



03 – Geopolitics

The G7 – India calling!

Issues have polarised global powers at multiple points in the past and three agendas of this decade have brought global powers together. These issues are: (1) Catastrophes of the climate change crisis, (2) Disruptive rise of artificial intelligence and (3) Allied technologies and the on-going Russia-Ukraine conflict.

The 49th annual summit of the G7 nations was held in Hiroshima, Japan in May 2023. Seven of the nine largest economies, seven of the ten leading exporting nations and seven of the ten leading donors to the UN along with guest countries such as India came together to chart a roadmap for a prosperous future together. The joint communique released by the G7 countries along with their invited counterparts had the flavour of all contemporary issues being faced by the world in present times. Noting the criticality of time, talks on climate change and just energy transition topped the agenda.

Continuing the tradition from the past, developed nations made an appeal to developing economies to peak their carbon demands by 2025 after which phasing out of non-renewable sources of energy should be the priority. The G7 partners along with their invited counterparts renewed their commitment towards reduction in use of fossil fuel, boosting renewable energy production and phasing out plastic pollution. The group also expressed its concern at the current pace of renewable energy adoption process. While climate change emerged as the area of foremost concern, the group remained non-committal on any immediate solution.

On the economic front, there was consensus amongst on the need for a globally concerted effort in controlling the fallouts of economic vulnerabilities. There was mutual agreement on ensuring financial sustainability and building the resilience of global financial system.

Three-front attack of covid pandemic, ensuing conflict between Russia and Ukraine and the consequential inflationary pressure on economic activities also exposed fault lines in global supply chains.

With the growing cross border trade, growing cross border trade, management of global supply chains has emerged as a matter of concern to large and small economies, alike. There was admission of the need to work with a unified concerted approach towards supply chain management with optimum resource utilisation.

On the infrastructure development, the G7 group of nations reiterated their commitment towards mobilising 600 bn USD to bridge the global infrastructure investment gap.

Addressing geopolitical issues, the G7 nations consensually agreed on reducing the economic dependence on China and move towards adopting economic measures to de-risk national economies without decoupling. Concern was expressed on the current situation in Taiwan, economic coercion by China and the present human rights condition.

In the field of AI and allied technologies, the G7 group expressed their commitment to work together to chart a framework for AI governance and ensure constructive use of technology for betterment of mankind.

The G7 summit was not just high on agenda but on symbolism too. The bringing together of some of the most powerful global leaders in the city of Hiroshima to talk of peace and charting a roadmap for a more inclusive and responsible leadership in times to come drove a strong message to the world. The G7 summit also concludes just a few months ahead of the G20 summit in India. The world today is looking towards Indian leadership to pave the way ahead for the emergence of a new global order and the consultations at the G7 summit will go a long way in defining the direction in which talks will be headed.

Given (1) the increasing prominence of India on the global stage, (2) the fact that it is one of the fastest growing economies, (3) that India has strategic engagements with almost all of the G7 countries, and (4) that India has cordial ties with both the US and Russia, it also is high time that India be a part of this group (extended G7 or G8).



04 – Infrastructure

Semi High Speed or High-Speed Railways – that is the question!

India's railway infrastructure operates under a complex matrix of policies. From Railways Act of 1989, which sets out safety and service standards, to the more recent initiatives like "Mission Raftaar" aiming at higher speed trains, policies have been instrumental in shaping India's rail landscape. Contemporary initiatives present a blend of high-speed and semi-high speed projects, each targeting different speed brackets. The Mumbai-Ahmedabad High-Speed line, India's first bullet train project, is expected to operate at speeds of 320 kmph, symbolizing an ambitious leap towards high-speed rail. In contrast, semi-high-speed initiatives like the Gatimaan Express and the Vande Bharat Express operate at speeds of up to 160 kmph, bridging the gap between conventional trains and high-speed trains.

Analyzing the current capabilities of Indian Railways reveals a system straddling between legacy infrastructures and modernization. Post the introduction of Linke Hofmann Busch (LHB) coaches which is now a familiar sight, and the implementation of Train Collision Avoidance System (TCAS) coupled with pursuit of semi-high speed corridors – the ecosystem has demonstrated a steady evolution towards improved speed and safety. As India stands at this juncture, the choice between semi-high speed and high-speed rail systems will significantly shape its future transportation architecture.

Semi-High Speed Rail, classified as systems operating between speeds of 160 kmph to 200 kmph, represent a practical solution for enhancing rail service efficiency without drastic infrastructural overhauls. Technically, these systems utilize upgraded versions of conventional rail lines, modern rolling stock, and improved signalling systems to achieve these higher speeds.

India's foray into **High-Speed Rail** is exemplified by the Mumbai-Ahmedabad High-Speed Rail (MAHSR) project. This revolutionary initiative, designed to reach top speeds of 350 kmph, is set to drastically reduce the travel duration between these two pivotal cities, from eight hours to an estimated two to three. The blueprint for this 508-kilometer rail network was formalized in 2016, with an operational deadline set for 2028.

Japanese technological know-how is anticipated to usher in a new era for Indian railways, prioritizing safety, speed, and service.

Comparative Analysis

The "Frontiers of High-Speed Rail Development" report by the Asian Development Bank Institute (ADBI) offers a comprehensive examination of high-speed railways (HSR). It addresses three essential inquiries: when a country is ready for HSR, the appropriate total length of HSR, and the justification for investing in HSR. The lack of readiness for HSR in India's case is evident in the struggles faced by Vande Bharat Express itself. Despite being designed to reach a maximum speed of 160 kmph, it has only managed to average around 83 kmph over the past two years. The slower than expected speeds of Indian trains can be attributed to several factors. Rail congestion is a prevalent issue due to the limited number of tracks available for a high volume of operating trains. Moreover, express trains often have to yield to passenger trains, leading to substantial scheduling disruptions. Most critically, the existing infrastructure is inadequate to support trains traveling at speeds of 110-130 kmph. The case of the Vande Bharat Express highlights the challenges stemming from lack of sufficient infrastructure. Despite the train's advanced design and technical capabilities, the current situation underscores India's urgent need to upgrade its existing rail infrastructure before contemplating the large-scale introduction of high-speed rail systems.

Conclusion

Semi-High Speed Railways present a more realistic and immediate approach to improving the efficiency and speed of India's railway ecosystem. They offer a gradual transition path that aligns with the current pace of upgrades in rail infrastructure, safety protocols, and traffic management systems. In conclusion, while the immediate emphasis may be more inclined towards Semi-High-Speed Railways given the current constraints, a parallel High-Speed Railways should be developed in parallel, with the long-term vision of a modernized, efficient, and world-class railway infrastructure in mind.

05 – Technology

Artificial Intelligence – Software is eating the world, but AI is going to eat software – Jensen Huang

Global economies are increasingly acknowledging the potential socio-economic benefits to be derived from the development and application of Artificial Intelligence. China and UK estimate that in 2030, nearly 26% and 10% of their GDPs respectively would be sourced from AI and allied technologies. Moreover, UK has planned to have 1,000 government supported PhD researchers by 2025 and has set up a Turing fellowship to support an initial cohort of AI fellows, while China has launched a five-year university program to train at least 500 teachers and 5,000 students working on AI technologies. Governments have significantly increased public funding for AI through commitments such as increased R&D spends, setting up industrial and investment funds in AI startups, investing in network and infrastructure setup, as well as AI-related public procurements.

India, being the fastest growing and largest economy in the world, has a significant stake and role to play in the AI revolution. According to a UNESCO report, the Indian AI market is expected to reach US\$7.8bn by 2025. Key factors driving India's rise in the AI ecosystem include easy access to cheap data as well as reducing cost of data storage. Moreover, the demographic distribution and availability of skilled engineering graduates indicate the advantage India holds. Recognizing AI's potential to transform the Indian economy, the government mandated NITI Aayog to establish the National Program on AI in 2018, with a view to guiding the research and development in new and emerging technologies. Ministry of Electronics and IT (MeitY) initiated a program titled FutureSkills PRIME in collaboration with NASSCOM, a B2C framework for re-skilling/ up-skilling of IT professionals in 10 emerging technologies including Artificial Intelligence.

The Government of Karnataka has set up a Centre of Excellence for Data Science and Artificial Intelligence in partnership with NASSCOM. A research group at IISc is working on the theory and application of

Reinforcement Learning (RL), an aspect of machine learning used in optimization problems. Their study is particularly focussed on traffic handling—both the vehicular traffic on roads, as well as the digital traffic from wireless networks. Furthermore, the Wadhvani Foundation has set up India's first research institute dedicated to developing AI solutions for social good in Mumbai in Feb 2018.

India possesses the necessary building blocks to develop a thriving AI research and development ecosystem, due to the availability of an educated talent pool, globally renowned educational institutes and an illustrious list of high-tech companies dominating the global IT landscape. These factors should have given India a natural first mover's advantage in AI but despite these apparent advantages, India is lagging in producing world-class research and innovation in the field of AI. India produces more than 4 times the number of graduates produced by the US, thus housing the required talent pool to drive innovation in these emerging technologies. But an overwhelming majority of this talent pool is focused on traditional IT development and not as much on research and innovation. Exacerbating the problem further, most of the talent focused on research prefers to pursue advanced degrees abroad and subsequently apply their expertise there.

While low adoption and unclear privacy, security and ethical regulations in India is a major concern, the government has rightfully assumed a lead role in setting the ball rolling. **What should ideally follow is the creation of a multi-stakeholder marketplace to facilitate interactions across AI value chain; designing of large foundational annotated data sets especially in native Indian languages for a wider reach; facilitation of partnerships and collaboration between research organizations, trade bodies and VCs; as well as spreading awareness and supporting startups through incubators, grants and loans.**

06 – Aerospace and Defence

Space as a geopolitical arena – Being nimble footed is key

The next war is not going to be in the legacy categories of air, land or sea. It is going to be “in” space and “for” space – a domain that is quickly getting contested, congested as well as competitive. Countries across the globe are today looking at space missions and space-related activities – from landing on Moon and on Mars to even intending to establish a space command. More importantly, space and allied technologies is not just restricted to traditional superpowers like the US and Russia. Many countries today, apart from India, including China, Japan, South Korea and Australia are developing their own space programs.

While the US incurs the largest expenditure on space programs at \$62bn in 2022, China is the second largest, albeit with a very huge gap, at almost \$12bn. **India’s space ambitions, with current space budget at slightly less than \$2bn, are relatively very small but are fast evolving.**

The Indian military has showcased the flexibility to leverage efficient utilization of space in military operations. One such example is the establishment of **Integrated Space Cell under Integrated Defence SHQ of MoD** to ensure better integration with civil entities like the DoS and ISRO as well as review and assess potential threats to assets in the space ecosystem.

The first dedicated military satellite GSAT-7 and the successful test of anti-satellite weapon (ASAT) have also suggested India’s seriousness towards the space segment in India. Space based assets have revolutionized the battleground by adding significant thrust to the capabilities and capacities of defence forces in intelligence gathering, surveillance, reconnaissance, navigation as well as situational awareness. Further enabled by space surveillance programs including Cartosat and RISAT, there is a huge improvement in accuracy of data collected from satellites and on board sensors, as well as in the capacity to deal with such data.

With the current and expected rate of evolution, it is important to be nimble-footed, but with a strong foundation. Space today is all pervasive and hence requires a joint effort of all concerned stakeholders to synergize this cooperation with the total defence ecosystem in the country. It is important that all stakeholders work jointly towards ensuring that space

is not weaponized, surely not to the extent that it can have catastrophic repercussions for the planet itself. That being said, the earlier the realization dawns upon everyone, the better it is for humanity. Space should be leveraged as a global science for global well-being.

There is still another potentially important area which is a derivate of all the above activities. Irrespective of the intent being civil or military, today space is getting heavily congested. The US Space Command indicates a reported number of 32,000 objects on orbit, including more than 3,400 satellites.

In today’s era, satellites are becoming very easy to launch due to (1) technological evolution leading to smaller satellites and lighter launch pads and (2) reduced costs largely due to the private sector inclusion globally. So much so that, more than 20,000 more satellites are expected to be launched into space for observation and communication purposes in the next 10 years.

Many countries today are leveraging space to pursue new capabilities. Gradually more affordable space systems will further lead to congestion and hence collision risk in space, while also making it difficult to track and identify/differentiate between friends and foes. There are reportedly millions of space debris orbiting the earth at average speeds of 22,000 miles per hour where as reported by NASA, “a 1 centimeter paint fleck is capable of inflicting the same damage as a 550 pound object traveling 60 miles per hour on earth”. **Congestion in space is a derivative of all civil and military purposes driven programs of all countries and slightest damage to even one such element in space has the potential to bring down a cascading effect on Earth.**

As more countries look to integrate space into military capabilities, there is also a remote possibility of non-state actors also being able to improve operational capabilities. This will also potentially result in dual use capabilities which would further make it a difficult exercise to again differentiate between good and nefarious intentions. To conclude, space has a lot to offer and it is important to leverage it considering the overall benefit of mankind and not the destruction of one – because a weaponized space will not just be harmful.



07 – Healthcare

Health ATMs – Revolutionizing healthcare, one kiosk at a time

The Concept

Health ATMs are self-service kiosks equipped with state-of-the-art medical devices and technologies. First installed in Mathura, Uttar Pradesh, these advanced machines enable individuals to perform a wide range of healthcare services independently, reducing the need for direct interaction with healthcare professionals for routine procedures. From basic diagnostic tests to health check-ups and even consultations with doctors, Health ATMs aim to provide accessible and affordable healthcare to people across all demographics.

The Key Features and Services

Health ATMs offer an array of features and services that cater to the diverse healthcare needs of individuals. Some of the common services provided by these ATMs include, Vital Sign Monitoring, Basic Diagnostic Test like blood glucose meters, cholesterol monitors, and urine analyzers wherein users can conduct tests at their convenience and receive immediate results, teleconsultations, Medication Dispensing some Health ATMs have the capability to dispense common medications, eliminating the need for a trip to the pharmacy for routine prescriptions.

The Benefits

Health ATMs in India serve two major purposes, accessibility of quality healthcare and giving the ownership of medical data to every individual to promote preventive healthcare. To further elaborate, following are the benefits of Health ATMs

1. Enhanced Accessibility

Health ATMs are strategically located in various public spaces, making healthcare services easily accessible, particularly in remote and underserved areas. They bridge the gap between patients and medical facilities, ensuring timely access to essential healthcare services.

2. Time and Cost Efficiency: Health ATMs save valuable time for patients by eliminating the need for long waits at clinics or hospitals. Additionally, the cost of certain healthcare procedures can be significantly reduced as users only pay for the services they avail, without

additional consultation fees.

3. Early Detection and Prevention: Regular health check-ups and monitoring provided by Health ATMs enable individuals to detect potential health issues at an early stage. Timely intervention and preventive measures can help in avoiding more serious conditions and reduce healthcare costs in the long run.

4. Empowering Patient Education: Health ATMs provide individuals with instant access to their health data and diagnostic reports. This empowers patients to take charge of their health, make informed decisions, and engage in proactive healthcare management.

As with any other revolution, Health ATMs too require acceptance from the masses. Since the users in this situation



are the general public, it is most critical to sensitise them to the concept and the benefits and to familiarize them to the machines and its workings. This will require long-term handholding, especially in the rural areas and continuous integration of user feedback to make the system as user friendly as possible.

Another important aspect is the regulatory framework that will bind the Health ATMs as the data and confidentiality of the patient must be protected and the accuracy of the test results or the quality of the drugs dispensed must be certified.

As the Health ATMs become popularized, the system must be integrated with the larger Digital Health infrastructure to truly reap the benefits of a seamless health system.

08 – Financial Services

LIBOR to SOFR – Not just a game of acronyms!

The financial landscape is undergoing a significant transformation as the industry moves away from the long-standing benchmark interest rate, the London Interbank Offered Rate (LIBOR), towards the Secured Overnight Financing Rate (SOFR). This significant shift, driven by regulatory imperatives & market vulnerabilities, is poised to reshape the workings of financial markets worldwide. **As the transition gains momentum, investors, corporations, & financial institutions are grappling with the implications & intricacies of this transformative endeavor.**

LIBOR, established in the 1980s, has been widely used as a reference rate for numerous financial contracts, including derivatives, loans, & bonds. However, LIBOR's credibility was significantly tarnished in the aftermath of the 2008 global financial crisis. Followed by a series of manipulation scandals, as evidence of misconduct & manipulation surfaced, highlighting its inherent weaknesses as an unsecured interbank lending rate. The Financial Stability Board (FSB) recognized the **need for a more reliable & transparent benchmark rate, leading to the development of SOFR.**

SOFR is a broad measure of the cost of borrowing cash overnight, collateralized by U.S. Treasury securities. Unlike LIBOR, which relies on banks' estimates, SOFR is based on actual transactional data from the repurchase agreement (repo) market, making it more **objective & resistant to manipulation.** This shift to a data-driven, secured rate aims to enhance market integrity & improve the robustness of financial benchmarks.

The transition from LIBOR to SOFR, however, is not a seamless process & poses multifaceted challenges for market participants, such as:

- **Contractual & Operational Challenges:**

Contractual modifications are necessary to replace LIBOR references, which may require time-consuming negotiations & amendments. System & infrastructure upgrades to incorporate SOFR-based calculations into pricing models, risk management systems, & operational processes.

- **Financial Products & Valuations:**

Market participants need to recalibrate pricing models & valuation methodologies. This adjustment process may impact pricing, risk management strategies, & profitability.

- **Accounting & Financial Reporting:**

Companies must assess the impact on hedge accounting, fair value measurements, & financial statement disclosures. It is crucial to stay informed about the evolving accounting guidance provided by regulatory bodies to ensure compliance & transparency.

- **Market Liquidity & Risk Management:**

Financial institutions need to re-evaluate their risk management frameworks, ensuring appropriate risk models & stress-testing methodologies are in place to address the potential implications of the transition. Robust risk management practices will be critical to maintain stability during this period of change.

This transition has far-reaching implications for market participants such as investors, lenders, financial institutions, etc., worldwide:

- **Corporate Borrowers:**

Necessitate adjustments to loan agreements, affecting interest calculations, fallback provisions, & overall borrowing costs.

- **Lenders:**

Lenders will need to recalibrate their pricing models, risk metrics, & loan documentation to accommodate SOFR. Adjustments in lending practices to ensure a seamless transition & maintain competitiveness in the evolving market landscape.

- **Investors:**

Investors in fixed-income securities will witness changes in yield calculations & pricing dynamics. Understanding the nuances of SOFR-based instruments will be vital to make informed investment decisions.

- **Derivative Markets:**

Market participants are required to transition legacy contracts to alternative reference rates or adopt fallback language to manage exposure effectively. The transition has sparked considerable efforts in developing standardized SOFR-based derivatives contracts & enhancing liquidity in the SOFR derivatives market.

The transition from LIBOR to SOFR **represents a fundamental change in the financial landscape.** As the LIBOR-SOFR transition unfolds, vigilance, collaboration, & proactive adaptation remain the cornerstone of success. While the transition poses significant challenges, it also brings forth opportunities for innovation & improvement. **Market participants are leveraging this shift to enhance their risk management practices, explore alternative funding options, & drive efficiency gains through automation & digitization.** This transition serves as a catalyst for financial institutions to reassess their operational frameworks, embrace technological advancements, & implement best practices. Market participants must stay informed, engage with regulators, & leverage industry resources to navigate the complexities of this paradigm shift.

By embracing this transformation, the global financial community can establish a more robust & resilient foundation that enhances market integrity, instills confidence, & paves the way for a sustainable future.



09 – Impact

Migration – a road to global development?

World Bank's World Development Report 2023, focuses on international migration and presents a framework that can be a win-win for origin and destination countries if policies are designed such that migrants' skills and attributes *match* the needs of destination countries. Origin countries can maximise the benefits of migration by incentivising investment and knowledge transfer by diaspora through a favourable business environment, reducing the effects of 'brain drain' and indeed driving 'brain gain' or 'brain circulation', protecting citizens abroad, facilitating and reducing the costs of remittances, and supporting returning migrants to re-enter the labour market with their newly developed skills.

Countries at every income level are facing challenges that can be solved through well-managed global labour markets. Rich countries need migrants to meet gaps in their labour markets arising due to skill gaps or ageing populations. Such migration in turn leads to increased national income, tax revenues, and availability and affordability of certain goods and services. Middle income countries are growing older before they become rich – and will need to compete for migrants. At the other end of the spectrum are low-income countries that have growing populations that suffer from unemployment and underemployment, but their youth lack the skills required by internal as well as global labour markets.

Migrants are a heterogeneous group and policies need to be designed to support and benefit from would-be migrants with varying levels of education, skills, and sectoral knowledge and interests. Migrants include people such as the highly educated Indian diaspora in Silicon Valley who have previously nurtured India's IT industry. Then there are Indian workers in the Gulf, who are estimated to have increased their incomes by 120% as compared to a 40% increase that would have resulted from internal migration within India. Such workers remit over 70% of their incomes back to India given low costs of remittances. It is further estimated that India would need over 20 years of economic growth for non-migrants to achieve the economic gains of those who have migrated to high income countries, thus making migration a 'no brainer' for such workers.

India has taken multiple actions to support successful migration and also engage with diaspora for India's economic development and soft power. India had developed the KNIT framework to identify opportunities to benefit from emigration. This included Knowledge Circle (to mentor, train and drive export of products and services),

New Product Sourcing (expanding Indian innovations to new markets), Investment (including in MSME sector), and Technology and IPR transfer to Indian companies (and joint development of IPR and R&D facilities in India for Indian and global markets). The Ministry of Skill Development & Entrepreneurship and Ministry of External Affairs have worked towards the signing of G2G and B2B MoUs with other countries to harmonise skilling, for mutual recognition of certificates, accreditation of training providers and networking with overseas recruiters to provide a skilled Indian workforce to global markets.

There is more India can do to further strengthen the benefits that India as a country and Indian citizens abroad receive from migration. It can learn lessons from countries such as the Philippines that has 54 bilateral agreements, for instance, for domestic service workers to abolish placement fees and provide a model contract to protect migrants' rights. Furthermore, the Philippine Development Plans include measures to mainstream migration, enable temporary movements, and support migrants' re-entry into the economy. **India's labour agreements and skilling partnerships with destination countries need to be substantially scaled up** to meet the challenge of India's high youth unemployment rates – CMIE estimated that over 45% of Indian youth below the age of 25 years were unemployed in December 2022. Schemes can be created for recognizing qualifications across countries as in case of the Single Market and Economy (CSME) initiative of the Caribbean Community (CARICOM).

India can use migration as a means for 'brain circulation' through reverse migration by expanding its capacity for training high-skilled workers in sectors such as STEM and healthcare. This would increase not just the number of high-skilled workers who migrate, but also help boost skills of those who choose not to migrate. India has the potential to become 'known' for providing skilled workers in selected fields, as the Philippines has done for nurses in partnership with private skilling institutions. The Philippines benefits additionally as for every nurse that emigrated, nine nurses were trained, increasing the number of nurses in the country.

India also needs to focus on driving a concentrated research ecosystem and continued improvements in Ease of Doing Business to attract R&D and entrepreneurship from migrants who establish partnerships or start new companies in India, or indeed reverse migrate to India to add to the richness of a creative and entrepreneurial ecosystem.



Narayan Prasad

COO, Satsearch
Co-Founder Spaceport
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Narayan serves as the Chief Operations Officer at [satsearch](#), a marketplace for procurement in the space industry that also enables streamlining of space missions and suppliers.

He is also a co-founder of Spaceport SARABHAI, a dedicated India focussed think tank to catalyze the fledgling Indian space economy while also being the host of the NewSpace India podcast, a bi-weekly talk show that exclusively focusses on India's space activities.

From largely being on the periphery of civilian activities, especially in India, space today is becoming core to military plans as well. Also, the recently approved Space Policy is an important step. What are your thoughts and what are the 1-2 critical areas where you feel the policy requires more focus – both strategically as well as operationally.

The Indian Space Policy of 2023 that has been recently approved by the cabinet is one small step in the direction of supporting the rise of the private space industry in India. It conveys the intent of the government to have greater private sector participation when it comes to the space industry. The space policy itself provides a charter for each of the newly established recent institutions such as Indian National Space Promotion, Authorisation Centre (IN-SPACe) and NewSpace India Limited (NSIL) and clarifies the role of the Department of Space and ISRO.

The next logical step to further create an even ground for the industry is to have legislation to provide IN-SPACe constitutionally backed strength to become a true regulator such as Telecom Regulatory Authority of India (TRAI) or Securities and Exchange Board of India (SEBI). We will have to wait and see how the space policy will be operationalized by all of the relevant institutions in the coming months since the policy itself doesn't talk about many of the detailed operational aspects of carrying out business within the different areas in the industry such as satellite communications, imaging, rocketry, etc.

We should hope that an IN-SPACe Act is introduced in the parliament in the coming years to be able to make progress on both the regulatory as well as dispute resolution mechanisms in the space sector. The space policy is also not specifically addressing any part of how the industry will be promoted. There should be a charter that is created to start engaging the private sector in providing services to address the government

demand at both federal and state levels. There needs to be clarity on how end user demand in various government departments and ministries will be exposed to the local industry to provide direct services.

This will not only create a local market that can be addressed but also will provide impetus for existing companies to expand their footprint and many more companies to be started and investors to participate in the sector. For the reforms to show results, from innovation in procurement to purchasing services directly from the industry remains key. This is also the direction many other countries are working towards at this time.

The space sector was opened up to the private sector around 3 years back. However, it is still an evolving industry. What according to you are the key 3-5 areas to make the sector more efficient in the coming 3-5 years.

Although the Indian private industry has been active in contributing to space missions emerging from India, most of the legacy industries involved with the space program in India are mostly service providers who are provisioning build to print manufacturing support or manpower services support. Until recently, the risk that space missions carried for the private sector to invest, had been very high. However, in the recent past we have seen interest in investors as well as a convergence in many other aspects such as maturity of miniaturised microelectronics, reduction in launch cost, etc., reducing the cost to access space.

There have been a few interesting companies that have emerged and also have been successful in raising substantial funding from investors to build space companies out of India. Most of these companies at the moment are independent and do not have any contracts that are emerging from government demand locally. Space as an industry thrives on government as an anchor customer around the world. In fact, there is probably no evidence that suggests that the commercial space industry that is thriving in a particular country can exist without government demand.

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Therefore in order to sustain strategic capabilities in the country and to expand the commercial footprint of the private sector to occupy a certain international market potential, it becomes extremely important that the government becomes an active anchor customer to de-risk the initial hurdles involved in establishing a product or a service. Further, the use of space has largely been limited to civilian purposes in India so far.

There have been some dedicated satellites for the armed forces but we are nowhere close to the capabilities that space is being exploited for by our adversaries given their focus on leveraging space as a part of the modern military. This is another area where the private sector needs to be effectively leveraged by the armed forces acting as an anchor customer to procure space-based capabilities as a part of the larger military modernization in India. The recent war in Ukraine has demonstrated the power of using commercial space capabilities for communication and geospatial intelligence. So far institutions such as IDEX have started funding R&D based projects through the Make 1 and Make 2 procurement categories in India.

However many of the operational requirements of the armed forces are still being captured by foreign companies directly. There needs to be a quick leapfrog from engaging the industry in R&D to providing contracts for operational requirements by the Indian armed forces so that our dependence on foreign service providers is reduced as well as a market is made available for local companies in India.

Being a capital intensive sector, do you think fractional ownership of assets, which is getting a lot of traction in real estate as well as in aviation, has scope thereby enabling more access to capital. Also your suggestions on how it can be worked out?

There has been a long legacy of fractional ownership of assets in this space industry for several decades given

that satellites in geostationary orbit are extremely expensive. In the case of providing direct to home television services, transponders on satellites are often owned fractionally by different service providers to make sure that the cost gets distributed while the transponder capacity is hosted on one big satellite. There are also some signs of this where imaging satellites and their capacity can be fractionally owned by either having ownership to a certain area of interest or a certain number of content to be tasked on the satellite. One could think of fractional ownership also in the ground systems where an asset which is talking to the satellite can be used by different operators as well.

These models have all been in the industry to a large extent. Interestingly in recent times, there has been a lot of push towards having full ownership of smaller satellites instead of fractional ownership of larger satellites in the space industry. The space industry is not anywhere close to maturity when compared to the real estate or the aviation sector which are tens or hundreds of times bigger compared to the space industry. Given that there are large trends towards using dedicated launch vehicles and dedicated satellite fleets, we will have to see in the coming decade how the industry sees sustainability against the legacy models of fractional ownership that have existed for a long time.

From a skill set perspective, what are your thoughts on the workforce in India and what steps can be taken to further strengthen the same especially in high end technologies, thereby helping meet demand with supply.

There is no doubt that India has a lot of local talent available given the demographic dividend it is reaping at the moment. However in the sector like space, a high level of expertise necessary for

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long-term success still remains largely with institutions such as ISRO given their legacy of doing space missions for the last 60 years. India is seeing the rise of several new space startups setup by very young entrepreneurs, often ones who have started space companies right out of college.

There is a lot of room for the wisdom and experience of ISRO scientists and engineers to meet with the young new startups and their workforce to achieve a healthy balance between youthful excitement and wisdom based on experience. There are however still quite a lot of gaps in finding experienced engineers who understand the constraints of operating in an environment like space and have reasonable experience to be able to lead smaller teams within companies aiming to build satellites or rockets.

IN-SPACE seems to be very keen on helping the emerging industry in tapping into ISRO's knowledge base by connecting the industry to the experts within ISRO to get advice. This is a welcome step in the direction of training human resources in the private sector. There is also a large pool of Indian scientists and engineers who are very well trained abroad who need to be incentivized to look at returning to the country and contributing to the growth of the sector. This is also very critical in order to reverse their brain drain.

With so many countries and companies working towards having a strong space based capabilities, space debris and space congestion are gradually becoming critical issues. What steps are being taken to ensure these do not become hurdles in the development process.

Perhaps the amount of orbital mass that has been put in the last 5 years exceeds the last 50 years prior. Therefore there is a problem with growing space junk as many of these satellites become dysfunctional

over the 3 to 5 years of service that they normally provide in Low Earth Orbit (LEO). We could draw some parallels from other industries such as aviation here for some perspective. When the airline traffic increased, there was a coordination mechanism built between airline manufacturers, flight operators, ground controllers, regulators and everyone involved in the aviation industry to have seamless air traffic movement with great attention to safety of aircraft and passengers. The ICAO has acted as a central agency for all stakeholders in the airline business to commit to standards and practices to ensure safety and so is the IATA which is set up as a trade association to help formulate the airline industry policy and standards.

When it comes to space, so far there has only been an Inter-Agency Space Debris Coordination Committee (IADC) that has been setup in the space sector and provides some recommendations to the satellite/rocket manufacturers and operators regarding debris mitigation. However, these recommendations do not have any legally bound compliance requirements. There are some recent efforts by various groups to build satellites that are purposed for cleaning up debris or build sensors either on ground or in space to be able to track pieces of debris.

Unfortunately, there is no clear business model that has still emerged in this particular area of the industry since cleaning up of space is an expensive affair and it is still very unclear who will continue to pay for it. One could also say this has parallels to the debate on climate change since most of the advanced countries are the ones who also have the highest amount of debris in space. As the industry moves towards maturity, we should hope that there is some mechanism that is established to replicate the success of ICAO and IATA in the space industry to ensure that space exploration is sustainable for future generations.

About Primus Partners

Primus Partners has been set up to partner with clients in 'navigating' India, by experts with decades of experience in doing so for large global firms. Set up on the principle of 'Idea Realization', it brings to bear 'experience in action'. 'Idea Realization'— a unique approach to examine futuristic ideas required for the growth of an organization or a sector or geography, from the perspective of assured on ground implementability.

Our core strength comes from our founding partners, who are goal-oriented, with extensive hands-on experience and subject-matter expertise, which is well recognized in the industry. Our core founders form a diverse cohort of leaders from both genders with experience across industries (Public Sector, Healthcare, Transport, Education, etc.), and with varied specialization (engineers, lawyers, tax professionals, management, etc.).



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