

# Issue

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# Brief

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# India at the Centre of the Indian Ocean Submarine Cable Network: Trusted Connectivity in Practice

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## **Abstract**

India is on its way to becoming “the Saudi Arabia of data”. This brief argues that India enjoys unmatched advantages of demography, economy, and geography and could be a hub of the submarine cable network that would facilitate the transport of data across the Indian Ocean. India’s public and private sectors should leverage these advantages to push the country to the centrestage of connectivity across the region and beyond. India’s G20 presidency offers a timely platform to demonstrate leadership through action in furthering this goal. It is in its national interest to act as a trusted digital superpower for the benefit of the Global South and the rules-based order, even as it serves as a force multiplier in mobilising its partnerships in prioritising trusted connectivity across the Indo-Pacific.

It is in India's strategic interest to be the leader of trusted connectivity in data flows across the Indian Ocean. Before the decade's end, India is expected to surpass China as the most populous nation in the world and overtake Japan as the world's third largest economy as well. It will likely remain the fastest growing large economy throughout this decade, and perhaps longer. India's demographic and economic trends also point to it becoming a digital superpower. India's public and private sectors should leverage these trends to push the country onto the centrestage of connectivity across the Indian Ocean. India's G20 presidency offers a timely platform to demonstrate leadership in furthering this goal.

India's digital consumer market is one of the world's largest and fastest growing. The national biometric digital identity 'Aadhaar', shared digital platform for goods and services tax, and cutthroat competition for telecommunications customers, have all contributed to this digital transformation in the recent years. India boasts at least 836 million internet subscribers<sup>1</sup> and has the highest average data usage in the world. The country's data traffic grew by 31 percent in 2021, with mobile data approaching 17Gb per user per month.<sup>2</sup> In the next five years, India is projected to expand broadband access to over 80 percent of its citizens with average usage of 40GB per month. India's digital economy has grown twice the rate of its economy<sup>3</sup> and its 5G expansion is on its way to ring US\$1 trillion by mid-decade.<sup>4</sup>

If indeed data is the new oil, India is on its way to becoming "the Saudi Arabia of data". As pipelines transport oil, submarine cables transport data. At present, some 500 submarine cables carry about 97 percent of global internet traffic, with the remaining 3 percent being serviced by satellites. Cable transmission capacity is in terabits<sup>5</sup> with low latency (low delay) while that of satellites is in 1,000 megabits with higher latency (higher delay). Digital transformation of global economy with associated technologies such as 5G- or 6G-facilitated internet of things (IoT) and increasing use of artificial intelligence (AI) and quantum computing point to an exponential rise in data movements across the globe.

The neural networks of a global digital economy are being laid on the sea beds in the face of a brewing geopolitical storm emanating from increasingly adversarial relationships between China and the world's leading democracies. This focuses attention on both the physical security of submarine cables and

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legal-political assurances that data in them flows free of public or private surveillance. It calls for trusted connectivity in submarine cable networks with assurances for both construction, maintenance and security of cables, and the legal-political assurances that no individual rights or freedoms are compromised by any public or private actors involved. The former points to the physical siting of cables with requisite resiliency by incorporating optimal redundancies to account for natural or malicious causes hindering or harming the network. The latter asks like-minded nations to collaborate in joint investments and agreed governance regimes for secure data free flow with trust.

“India’s G20 presidency offers a platform to demonstrate leadership in building connectivity across the Indian Ocean region.”

# Continuing Evolution of Submarine Cables

The first cables to transverse the seas conveyed telegrams, then they relayed telephone conversations, and now they drive the digital economy worth US\$10 trillion of transactions per day. Britain, fuelled by running an empire “on which the sun never set”, originated and dominated the 19<sup>th</sup>-century global telegram subsea cables. In 1858, Britain and Canada were connected by a telegram line across the Atlantic. Bombay was linked to Saudi Arabia in 1868, to London in 1870, and to Australia (via Singapore) in 1872.<sup>6</sup> Britain, concerned that its adversaries may sabotage its communication, boasted the All Red Line, a worldwide telegram cable network that touched land on its colonies. Through the 1800s, Britain owned and operated two-thirds of the world’s subsea cables and 24 of 30 cable-laying ships flew the Union Jack. In the First World War, one of the first hostile acts of Britain was to cut the five cables connecting Germany to France, Spain, Azores and through it to North America.

By the middle of the 20<sup>th</sup> century, improved cables were facilitating telephone conversations. In 1956, the first transatlantic (TAT1) telephone subsea cable with 48 channels connected North America to Europe. In 1960, Portugal was linked with South Africa and in 1964, Sydney with Vancouver. In 1986, the telephone cable from France to Singapore over 13,584 km was installed (South East Asia–Middle East–Western Europe (SEA-ME-WE 1)).<sup>7</sup>

The early cables used copper wires to transmit information. In 1988, the first fibre-optic cable went into operation connecting the United States to France and Britain (TAT8). Fibre-optic cables with greater capacity characterise the modern submarine cable industry. The modern fibre-optic cables are about the size of a large garden hose with thin glass fibres encased in metal and plastic. The pair of fibres, with each transmitting in the other direction, are a handy indicator of a cable’s carrying capacity measured in terabits per second (Tbps). TAT8 had two operational pairs and one spare. Modern cables under construction may hold up to 16 or 24 pairs. Seemingly insatiable demand for data in size and speed, fuelled by emerging technologies and exploding consumer base, presses the industry for greater capacity with reduced costs per bit.

Historically, the investment drivers in submarine cables have been the leading industries in communications and data. After initial British dominance through the age of the telegram, most of the submarine cables were funded by a consortium of telecommunication companies. TAT8 was composed of 35 leading international operators including AT&T. Today, the main drivers of

# Continuing Evolution of Submarine Cables

cable capacity are the companies building mega data centres located in different parts of the globe that need to be in constant and instantaneous touch with each other. Locations of data centres increasingly influence the siting of submarine cables.

Hyperscalers—the large cloud service providers that facilitate software architectures to scale and grow with demand—are driving and shaping the cable industry. Since 2010, the big four of tech—Amazon, Google, Microsoft and Facebook—have invested in over 40 cables either as consortium partners or sole proprietors. Their collective ownerships in miles is estimated at 63,605 for Google; 57,709 for Facebook; 18,987 for Amazon; and 4,104 for Microsoft.<sup>8</sup> The internet content providers' share of cable capacity reportedly jumped from less than 10 percent in 2012 to over 65 percent in 2020.<sup>9</sup> Google has invested in at least 19 cables, six of which are private, i.e. solely owned. These include the transatlantic *Grace Hopper*, transmitting 350 Tbps over 16 pairs; *Equiano* from Portugal to South Africa; and *Firmina* from the US East Coast to Argentina, Uruguay and Brazil. Facebook is working with NEC for a transatlantic cable with capacity of 500 Tbps over 24 pairs.<sup>10</sup>

Three companies—Subcom (US), NEC (Japan) and Alcatel Submarine Networks (France), a subsidiary of Nokia—dominate the construction, deployment and maintenance of submarine cables. Huawei Marine Networks (HMW), built on China's acquisition of UK's Global Marine, is striving to grow its market share. HMW represents the lead instrument for China achieving its stated goals of capturing 60 percent of global market as echoed in its many initiatives including the Digital Silk Road, Belt and Road Initiative, Made in China 2025, and China Standards 2035.<sup>11,12</sup>

The transatlantic networks dominated the subsea cable industry through most of the 20<sup>th</sup> century. By its last decade, Indo-Pacific lanes attracted the most investment and continue to do so today. The inter-Asia market records the fastest growing investments in the industry.<sup>13</sup> Additionally, emerging markets of Africa and South America are garnering strong interest and investment as evidenced by Google's investments.

# India as the Hub of Submarine Cables in the Indian Ocean

India sits at the continental crossroads of the fastest growing market in submarine cables and has a ripe opportunity to establish itself as the leading hub of trusted connectivity in the Indian Ocean and beyond. Its ability to do so will be beneficial for India, the Global South, and the rules-based order.

No nation than India is better situated by demography and geography to be a leading data hub. For one, it boasts one of the youngest, largest and fastest growing digital markets. Its tech industry, with the largest pool of trained personnel, is formidable. India's digital economy is a key in achieving the country's ambitions to become a US\$10-trillion economy by 2035. Geographically, India is situated at the centre of a region with the fastest broadband expansion. Indonesia's rate of broadband growth, for instance, rivals India's; meanwhile, African nations boast some of the fastest rates of broadband penetration in the region. Most, if not all, Africa-Asia and Europe-Asia cables connect through India.

At present, India has around 17 submarine cables terminating at 14 distinct cable landing stations in five cities—i.e., Mumbai, Chennai, Cochin, Tuticorin and Trivandrum. Through 2021, the available and used capacity of these cables amounted to 124 and 84 Tbps, respectively. The existing cable landing stations are owned by Tata Communications (5), Bharti Airtel (3), Reliance Jio (2), Global Cloud eXchange (formerly Reliance Globalcom) (2), and others including Sify, BSNL, and Vodafone. Historically, Tata Communications (having acquired the state-owned Videsh Sanchar Nigam Limited in 1995), the company and Mumbai, the city with nine landings have been on the forefront in India's global connectivity. However, the Indian market is fast evolving, and several new cables are coming into operation in the next few years with additional coastal cities for landings.

By 2025, India is expected to have the following notable new cable links:

- *India-Asia Xpress (IAX) and India-Europe Xpress (IEX)* represent Reliance Jio's ambitious project spanning 16,000 km and scheduled for operations in 2023 and 2024, respectively. The IAX stretches east to Singapore and IEX west to the Persian Gulf and Europe, with capacity of about 200 Tbps. The projects are funded by a consortium that includes Facebook, Google, KKR, Saudi Arabia, Abu Dhabi, and Qualcomm, and constructed by Subcom.

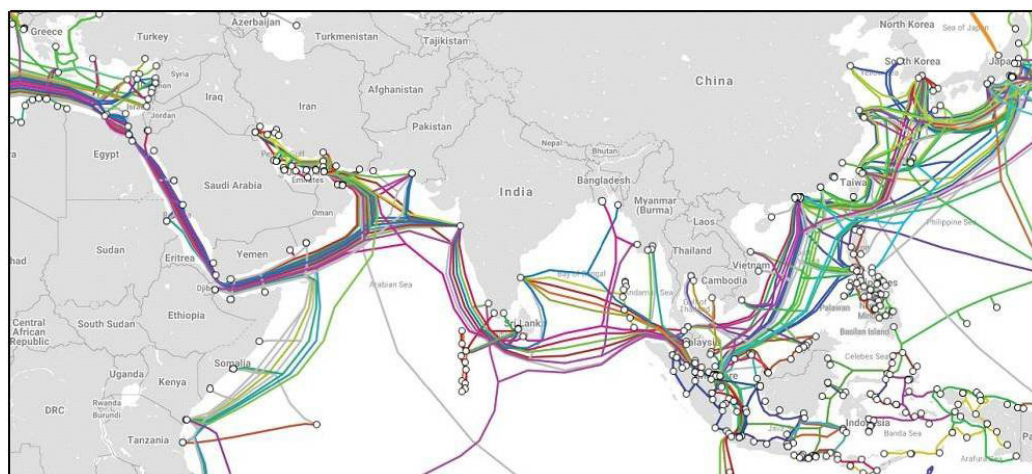
# India as the Hub of Submarine Cables in the Indian Ocean

- **MIST** connecting Mumbai and Cochin to Myanmar, Thailand, Malaysia and Singapore is an 8,100-km cable with capacity of 218 Tbps. It is scheduled for operation in 2024 and is funded by a Japanese joint venture and built by NEC.
- **Blue-Raman** stretches from Italy to India. It includes two segments: Blue connecting Italy, Greece and Israel; and Raman (named after Indian physicist C.V. Raman) linking Jordan, Saudi Arabia, Oman and India. It is funded by a Google-led consortium that includes Telecom Italia Sparkle and Omantel, and constructed by Subcom with scheduled operations in 2024. The cable carries 16 pairs with capacity in excess of 200 Tbps. It is the first cable to circumvent the Egyptian choke point by traversing across Israel.
- **SEA-ME-WE 6** upgrades the link from Singapore to Marseille, traversing 19,200 km carrying 10 pairs with a capacity of 126 Tbps. It is constructed by Subcom and scheduled to be operational in 2025. It is funded by a traditional consortium of telecommunications companies from Singapore, Malaysia, Indonesia, Bangladesh, Pakistan, Maldives, Sri Lanka, Saudi Arabia, Egypt, Djibouti, and France. Bharti Airtel from India has acquired one pair on the main and plans to co-build four additional pairs from India to Singapore.
- **2 Africa Pearl** represents a South Asia extension connecting India and Pakistan to **2 Africa** cable that orbits around the continent and connects to Europe. Collectively, it claims to be the longest cable at 45,000 km connecting 33 nations in Africa, Asia and Europe over 46 landing sites. It is constructed by Alcatel Submarine Networks with capacity of 180 Tbps over 16 pairs. It is a funded by a consortium whose members include Facebook, China Mobile, Orange, Vodafone, and other telecommunications companies. Bharti Airtel is engaged in the **2 Africa Pearl**. The cable is scheduled to be operational in 2023/24.



# India as the Hub of Submarine Cables in the Indian Ocean

**Fig 1:  
Illustration of Submarine Cables  
Across India**



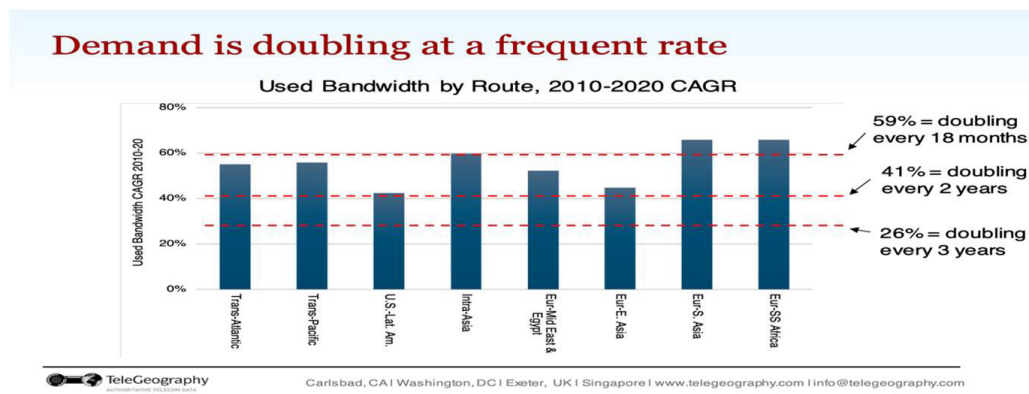
Source: <https://www.submarinecablemap.com/country/india>

India to Europe and India to Singapore represent the historic routes attracting the most attention and investments. Projects in addition to those mentioned above are in development along these two routes. To enhance resiliency in its global connectivity, India needs more diversity in landing sites and alternatives to choke points such as Egypt to the west and Singapore to the east. Greater domestic cable connectivity is projected beyond those linking Chennai to Andaman-Nicobar Islands and Kochi to Lakshadweep islands.

India's projected demand for connectivity, notwithstanding the substantial augmentation over the next five years, exceeds the planned supply. India's used international bandwidth is projected to increase 10 times between 2021 and 2028 at a compounded annual growth rate of 38 percent.<sup>14</sup> Four reinforcing drivers may further propel the projected demand. First, the rapid growth in smart phones and data usage. Second, greater investment in data centres drawn by India's market potential and relocations from China. Third, augmented global connectivity by new cables facilitating improved connection at lower costs catalysing a positive loop for greater demand. Fourth, an improved regulatory environment for locating data centres and submarine cables.

# India as the Hub of Submarine Cables in the Indian Ocean

**Fig 2:  
Rate of Bandwidth Growth Across  
Major Cable Routes**



Source: Telegeography. <https://www2.telegeography.com/hubfs/LP-Assets/Ebooks/state-of-the-network-2022.pdf>

India's data centre ecosystem is booming, driven by rapidly rising data usage, greater adoption of cloud services, and the pressures on companies to relocate from China. The market value of India's data centres is projected to rise from about US\$4 billion in 2021 to US\$11 billion in 2024 and the capacity will likely double from about 500 MW in 2021 to over 1,000 MW in 2023.<sup>15</sup> Advantages associated with the government's recent reclassification of data centres as infrastructure may further boost investment. India, in 2022, had 11 cloud regions with Google adding to its Mumbai location and another around Delhi. Amazon and Microsoft have both announced plans for establishing new regions in Hyderabad. Japanese NTT has pledged US\$2 billion over four years in data centres, submarine cables and associated investments in India.<sup>16</sup> The Telecom Regulatory Authority of India (TRAI) has engaged the industry to improve cable landings and maintenance while facilitating faster investments.

# India as a World Leader in Trusted Connectivity

It is in India's national interest to harness the prevailing economic and political currents to invest and establish itself as a world leader in trusted connectivity. Drawing on its efforts to foster physical connectivity through a Coalition for Disaster Resilience Infrastructure,<sup>17</sup> India should convince like-minded nations to form a coalition for affordable, resilient and trusted digital connectivity. In so doing, it could position itself as the indispensable trusted data hub in the Indian Ocean.

Trusted connectivity calls for regional and global recognition in making available best-in-the-business connectivity under an accountable governance system that respects and protects individual dignity and freedoms. As the world's largest democracy and soon to be its third largest economy, India has the digital muscle and democratic fibre to be the leader of trusted connectivity in the hemisphere. India, in sustaining its prohibitions on Chinese communications companies, needs to offer a better trusted connectivity alternative for the countries in its neighbourhood. At present, Huawei Marine Networks (HMN) operates the *Peace Cable* circumventing India as it connects Karachi and Chabahar to Marseille, Mombasa and Singapore. HMN also operates a national cable across Maldives and another linking it to Sri Lanka.

India enjoys unmatched advantages of demography, economy and geography to be a leading global hub of submarine cable network. To avail its high promise and potential, the Indian government needs to put in place policies and regulations that attract investments at a rate commensurate with its rapidly expanding digital economy. India has historically played a passive, receptive role in earth spanning cables. Its expanding youth, nurtured on digital economy with a high ceiling, call upon the country's leaders to play an active role in cross-border data flows by serving as a global hub of submarine cable network.

India may pursue five pathways to distinguish itself as the preferred provider of trusted connectivity across the Indian Ocean.

First, India must become a regional and global data hub. This calls for renewed commitment and resources for improved domestic and global connectivity. The domestic push for broadband connectivity, particularly in the rural areas, should be coupled with equal or greater import to submarine cable networks connecting India to the world. The TRAI's laudable efforts warrant highest federal and state support, in offering the optimal regulatory,

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tax and infrastructure priority to establishing data centres with proximate submarine cables for global connectivity. India's geographic advantages in relatively shorter distances to Africa and Southeast Asia, compared to the width of the Atlantic and Pacific oceans, should be coupled with reliable physical and regulatory infrastructure to make India an attractive investment destination. With economies of scale from greater connectivity and volume, India's data costs will approach parity with Atlantic and Pacific routes. Indian prosperity and security require substantially greater resiliency in cable connectivity than available at present. Any malfunction in even less than a half-dozen cables could result in over 75-percent loss in India's connectivity to Europe. India has the ability and incentive to invest in a robust and trusted regional connectivity network.

Second, India must be the reliable guarantor of connectivity in the Indian Ocean. In the specialised submarine cable industry, there are a limited number of ships for cable deployment and maintenance. Most, if not all of these, are deployed along the Atlantic and Pacific oceans, both of which witness heavy traffic. India may undertake appropriate regulatory steps to allow for ease of access by maintenance ships in its territorial waters and coordinate with industry leaders such as Subcom, NEC and Alcatel to develop domestic capacity for cable maintenance. It is in India's economic and security interest to host the leading capacity for repair and maintenance of subsea connectivity across the Indian Ocean.

Third, India must mobilise its alliances and partnerships in prioritising trusted connectivity across the Indian Ocean. It should leverage the Quad group for greater investment and priority to submarine cables and trusted connectivity across the Indian Ocean. India and Japan may expand the ambition and scope of their growing partnership in trusted connectivity on the heels of the MIST cable and NTT's investment in India data centres. India and Japan could use their presidency of the G20 and G7, respectively, to bring Indian Ocean connectivity on par with that of the Pacific Ocean to ensure a free, open, secure and prosperous Indo-Pacific. Enhanced digital connectivity between India and the ASEAN nations is critical to ensuring a 'free and open' region. The elevated digital and security partnership between India and the United States further strengthens India's rising stock as an investment destination for the American industry leaders in the digital economy, including data centres and submarine cables. India and Australia may further strengthen their bilateral connectivity to bolster resiliency in their respective global reach.

# India as a World Leader in Trusted Connectivity

The India-Europe partnership also offers potential for improved trusted connectivity with shared aspirations and incentives. Trusted connectivity and improved India-Europe submarine cable connections should feature prominently in the European Union's Trade and Technology Council deliberations with India.<sup>18</sup> Greater resiliency and volume in India-Europe digital connectivity is in both their economic and security interests. Particular attention is needed to develop alternative routes to known choke points such as along the Suez. The Blue-Raman cable, with Google and Italian telecom as investors, has opted to bypass Egypt and link the Mediterranean and Red Sea over Israel and Saudi Arabia. European Commission President Ursula van der Leyen has highlighted the role of submarine cables in the EU's Global Gateway initiative to improve connectivity worldwide. Under India-EU connectivity memoranda, India is well situated to serve as Europe's strategic partner for the Global Gateway in the Indian Ocean. Additionally, India may also be able to reach Central Asian and Caucasus nations by strategic linkages to planned Global Gateway submarine cable projects in the Mediterranean, Black and Caspian seas.

Furthermore, India-Africa and India-Persian Gulf connections hold the promise of high growth and potential as emerging markets come online. Gulf nations need improved connections with the biggest digital economy in the neighbourhood—India—to achieve their stated ambitions of moving beyond fossil fuel-dependent economies. Conversely, Gulf and East Mediterranean nations are a critical bridge to improved India-Europe connectivity. The India, Israel, UAE and US (I2U2) grouping, launched in 2021 has the potential to be a driving force in facilitating expansion of India-Europe connectivity. It is in Italy's strategic interest to closely engage with the I2U2 Group—with a possible future accession, thereby making it 'I3U2'—in bringing this vision to fruition.<sup>19</sup> There are discussions on greater cable connections between Gujrat and Saudi Arabia. India should engage Egypt in a strategic dialogue for improved connectivity and costs associated with India-Europe cables. A forward-looking strategy for faster and greater cable connections between Africa and India commensurate with projected market growth is warranted. It should be a top item in India's engagement with African nations along the Indian Ocean.

Fourth, India must champion trusted connectivity for the Global South. India has been keen to give voice to the aspirations and concerns of the Global South during its G20 presidency. It is well positioned to be a forceful proponent for expedited incorporation of developing and emerging nations into the global

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digital economy via trusted connectivity. It can lead by example by offering improved connectivity on better terms than the autocratic alternatives to nations across the Indian Ocean. India, through improved connectivity may not only offer access to its enormous digital market but to a host of additional resources like remote education and health solutions.

Fifth, India must engage in developing a global governance framework for trusted connectivity. India should leverage the Quad and its growing partnership with Europe to be an active player in developing an agreed trusted connectivity framework. With its G20 presidency, India, in close coordination with Japan as the president of the G7, may call for greater consensus on operating rules and guidelines on data free flow with trust. Like Europe, India has the advantage of the size of its digital market to be a standard-setter in the digital economy. As one of the fastest and largest digital economies in the world, it is in India's interest to shape rules of the road for trusted connectivity.

“India must mobilise its alliances and partnerships in prioritising trusted connectivity across the Indian Ocean.”

# Conclusion

Owing to its sheer size, India is an indispensable player in the global digital economy. It remains to be seen, however, how active a role it will play in shaping the new economy not only in the Indo-Pacific region but beyond. With foresight and optimal leverage of its considerable demographic, economic, geographic and technical advantages, India can both champion and deliver trusted connectivity across the Indian Ocean and the Global South.

For it to become a trusted digital superpower, India must lead by example and, first, become the hub for the data-driven economy and submarine cables across the Indian Ocean. It may then leverage its regional pre-eminence in buttressing cable connectivity with the leading Atlantic and Pacific economies. Indian public and private leaders owe aspiring Indian youth the best possible access to the global digital economy; and to the global youth and entrepreneurs—open and trusted access to the world’s largest national population and the fastest growing large economy. The accomplishment of these twin goals may yet be one of the transformative features of the first half of the 21<sup>st</sup> century. [ORF](#)

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