



Proof of Eminence

Indian scientists and innovators have had numerous achievements in the past 75 years that have made us all proud. If the Green and White Revolutions ensured food security for the nation, its nuclear, space and defence research has placed India among the global leaders. Here, we select the key milestones that have been game-changers for India



NAMAS BHOJANI

Exploration Geologists

Fuelling India's early oil exploration

It is not widely known that every hydrocarbon molecule in India's oil reserves has been discovered by Indian exploration geologists. North Sea oil and offshore Bombay High oil and gas were discovered almost simultaneously. But India beat the UK in bringing the production to its peak earlier. This was achieved by the technologists of the Oil and Natural Gas Corporation (ONGC) under the leadership of its visionary chairman Bhanu Prasad. Mumbai High and Bassein are today India's top oil- and gas-producing fields, accounting for almost two-thirds of the country's total production.



Process Chemistry

Making India the 'Pharmacy of the World'

India is now known as the 'pharmacy of the world', ranking third in pharmaceutical production. It exports pharmaceuticals to more than 200 countries and territories, fulfilling 50 per cent of the global demand for vaccines and 40 per cent of generic demand in the US.

This was fuelled by the prowess of process chemistry and engineering of the Council of Scientific and Industrial Research (CSIR)'s chemical group of laboratories such as the NCL, IICT and CDRI in the early 1970s. The price of antiretroviral treatment for HIV-AIDS,

which was \$10,000 per person annually in 2000, has been brought down to \$120. The trigger was the process chemistry innovation done at the IICT, and commercialised by Cipla. This not only saved millions of lives but also led to the landmark 2011 Doha declaration.

Connectivity Revolutions

Bridging the digital divide

Connectivity Revolution 1.0 happened in the mid-'80s with physical telephony. C-DOT triggered the telecom and IT revolution by launching an indigenous digital rural 128-line electronic exchange, which could work in dusty conditions, and despite erratic electric supply. It connected Indian cities and villages for the first time. Connectivity Revolution 2.0 happened with mobile telephony. India had ranked 155th globally

in mobile data consumption in 2017. Reliance's Jio catapulted it to the first position. Jio paved the way to accelerating Digital India and bridging the digital divide meaningfully by connecting over 450 million Indians to the Internet in less than five years, thus fundamentally changing their lives. The affordable access to the internet in its every nook and cranny has paved the way for India's advanced digital transformation.

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Nuclear Prowess

From being denied technology To self-reliance

By conducting the successful nuclear tests of Pokhran-1 in May 1974 and Pokhran-2 in May 1998, India boldly showcased its self-reliance in nuclear weapons development. The Indian tests changed the nature of the international non-proliferation game as well as the structure of international security. The Nuclear Suppliers

Group severely affected India's nuclear programme, with the world's major nuclear powers imposing a technological embargo. But this denial helped develop our self-reliant capability in atomic energy in power and non-power applications, nuclear submarine, and both fission and fusion/thermonuclear-based weapons.



REUTERS

India Stack

Digital India among global frontrunners

India Stack positioned Indians as the trailblazers of the Internet age by promoting financial and social inclusion across the country. The foundation for this digital transformation was laid by the Aadhaar card that provided identity to 1.3

billion Indians by enabling quick identification of the user digitally, anywhere, anytime. In 2016, the second arm of India Stack was born with the announcement of the Unified Payments Interface (UPI) that catapulted the entire nation into the era of digital payments just by scanning a QR code. Within just six years, it has become the world's fifth largest payment network by volume, surpassing over 20 billion online transactions during the second quarter of 2022.



AFP

ISRO

A glorious space story

In 1981, the Indian Space Research Organisation (ISRO) carried its APPLE Satellite on a bullock cart. In four decades, India has achieved global leadership, with ISRO launching 129 satellites of Indian origin and 342 foreign satellites from 36 countries. This satellite-enabled data and services capability acted as building blocks of India's IT and telecom revolution, offering a platform for game-changing solutions—

from weather forecasting to television broadcasting to mobile communications. Its impact traverses multiple dimensions. For instance, the National Stock Exchange (NSE) did satellite-based financial market trading for the first time in the world. VSAT technology was used to build computer-based order matching at the exchange, resulting in a quantum leap in the quality of the Indian equity market.

GETTY IMAGES



Covid Vaccination

India as the 'Vaccine Capital of the World'

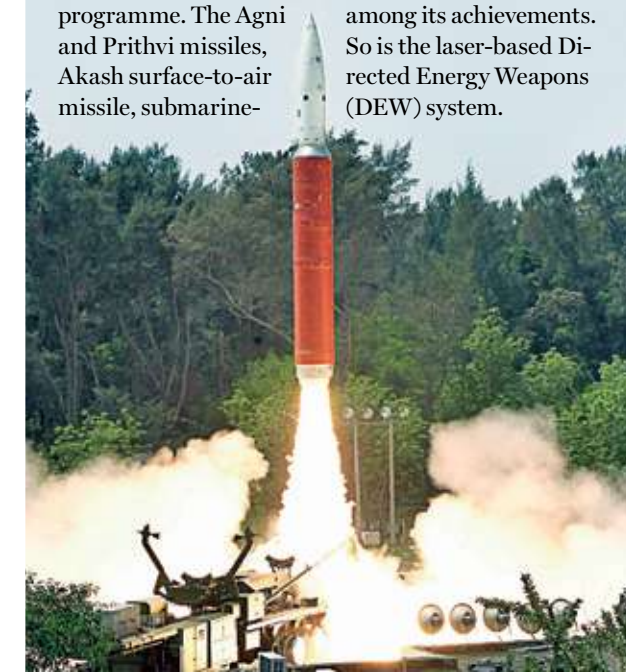
India had already established its reputation as a leader in research, innovation, manufacture and deployment of vaccines, be it polio, hepatitis B, rotavirus, etc. But this Indian capacity was stress-tested during the Covid-19 pandemic. The Serum Institute of India came out with a Covid vaccine based on licensed technology. The National Institute of Virology and Bharat Biotech jointly developed Covaxin. These indigenous vaccines saved millions of lives. The effective management and administration of over two billion doses within a record time of 18 months was made possible by the CoWIN platform, built by the National Informatics Centre.

DRDO

From tech-deprivation to techno-nationalism

Despite the denial of strategic technologies, the Defence Research and Development Organisation (DRDO) achieved many milestones, such as the rocket and missile programme. The Agni and Prithvi missiles, Akash surface-to-air missile, submarine-

launched ballistic K-15 missile system and supersonic cruise missile BrahMos, which was developed in partnership with Russia and was the fastest in its category when introduced, are among its achievements. So is the laser-based Directed Energy Weapons (DEW) system.



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