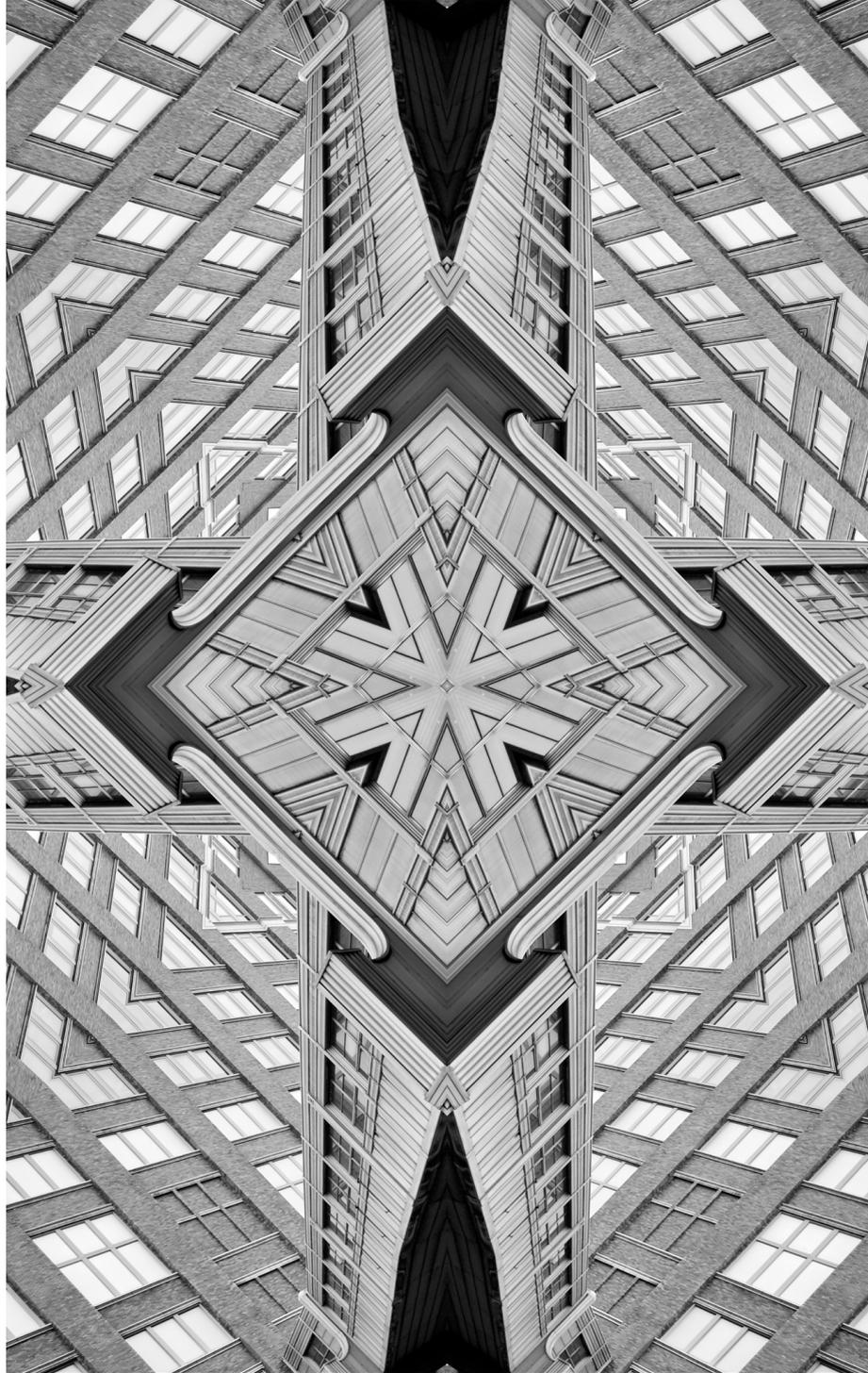


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The India Stack as a Potential Gateway to Global Economic Integration

Erin Watson

Abstract

India's Digital Public Infrastructure (DPI), known as India Stack, has not only had a profound impact on the country's economy but also has potential significance for global economic integration. This brief elucidates how this framework has facilitated financial inclusion, spurred innovation, and propelled economic growth in India. It highlights the foundational role of the India Stack in transforming the country's financial landscape, and advocates for its adoption as a model for other countries seeking to leverage digital technologies for economic development. As nations navigate the digital evolution of the global economy, integration with the India Stack offers a promising pathway towards fostering greater economic cooperation and inclusive growth on a global scale.

From a small shop tucked away somewhere in the western part of Delhi, Jasmeen Kaur skyrocketed to internet stardom with her “Just looking like a wow!” Instagram reels. The endearing videos of Jasmeen showcasing her latest sarees and suits to potential clients even caught the attention of Bollywood stars and their hundreds of millions of followers. As a woman entrepreneur in India, Jasmeen was riding the wave of India’s economic growth and using the tools at her disposal to beat the competition. Yet, for women like her, it is not just the power of digital marketing that is reshaping their business potential, but India’s revolutionary approach to Digital Public Infrastructure (DPI) known as the ‘India Stack’.

The India Stack is a set of digital public infrastructure components that comprise three pillars: digital identification; payments; and data management. India’s approach to digitalisation has fundamentally changed lives, giving biometric identification to those previously not identifiable, banking the unbanked, and giving people control and privacy in managing their own data.¹ For women like Jasmeen, the ubiquity of the Stack means she can receive payments from consumers, share legal documents with her bank or lawyer, pay her suppliers, receive loans or investments, and coordinate delivery payments through the fast, easy, and cheap technology.

Given how Indian society and economy is now structured around DPI, and with its enormous diaspora across the globe, there is significant opportunity to unlock the country’s economic potential to international markets.² This article argues that as countries pursue economic diversification and grapple with the digitisation of the global economy, they should look to the India Stack for learnings in how to effectively unlock economic potential in their bilateral relationships and for their own digital public infrastructure. As developed countries seek to reform legacy financial systems or developing countries build new ones, India has a world-leading solution that can revolutionise how global economies engage with India and with each other. Integrating India’s DPI means international markets can go from “just looking” at the India opportunity, to building deep integration with its economic system.

The first section describes India’s approach to DPI and its key components, with a focus on its digital identification and payments systems. The article then outlines the international opportunity as exemplified by the case of Singapore and India’s DPI cooperation. The third section includes key lessons that other countries and markets can learn from India’s DPI experience. The essay concludes by offering a key takeaway: that India has revolutionised DPI with the India Stack, and global economies can benefit from integration.

India's Approach to Digital Public Infrastructure

Digital Public Infrastructures are the railways of digital technology. For India, its approach to DPI is based on the foundation of open-source, interoperable, and scalable technology along with transparent, accountable, and participatory governance frameworks.³ A layered 'stack' of open-source Applications Programming Interfaces (APIs) are owned and maintained by different government agencies, and developers can build software using these APIs to deliver cheap products to the market.⁴ This technology has laid the foundation for a robust digital services infrastructure, and it fosters innovation and entrepreneurship leading to the development of a wide range of applications and services across sectors, including finance, healthcare, and education, contributing to economic growth and technological advancement.⁵

By design, India's DPI was built to be universally accessible for adoption, reuse, and replication by countries worldwide. India's example demonstrates that collaborative digital solutions are a way to deliver vital services to the population in a way that is scalable. This type of DPI not only propels innovation, competition, and inclusivity but is also underpinned by regulatory frameworks that facilitate its operation. It is further supported by a robust technological layer, a well-defined governance framework, and a diverse multistakeholder ecosystem.⁶

As the foundational layer to the India Stack, the *Aadhaar* programme is a biometrically secured digital system that has since brought over 1.3 billion people online.⁷ Aadhaar has enabled electronic Know Your Customer (eKYC) with simultaneous identification, which means that citizens can open bank accounts in minutes instead of the two to four weeks it would take previously.⁸ This is coupled with the Indian government's financial inclusion programme, *Pradhan Mantri Jan Dhan Yojana (Jan Dhan)*, which has brought over 500 million people—the majority of whom are women—into the banking system.⁹ In the 10 years between 2011 and 2021, India's bank account ownership doubled to 71 percent of the population, with a gender gap of effectively zero.¹⁰

The sheer scale of Aadhaar meant it became the base layer that enabled the integration of the Unified Payments Interface (UPI)—a real-time payments system that enables users to link multiple bank accounts into a single mobile application. Today, over 68 percent of transactions in India are conducted using UPI, with 10.6 billion transactions taking place in August 2023 alone.¹¹ UPI is facilitated by the National Payments Corporation of India (NPCI) and

India's Approach to Digital Public Infrastructure

regulated by the Reserve Bank of India (RBI).¹² That UPI is built upon the Aadhaar and other layers of the open-source Stack, overall transaction costs in the economy are significantly reduced. This not only benefits businesses by making transactions more cost-effective for consumers, but also encourages the shift from cash-based transactions, leading to greater transparency and accountability in the financial ecosystem.

In addition to the Aadhaar and UPI, a third layer to the India Stack is the Data Empowerment and Protection Architecture (DEPA)—a regulated framework introduced by the RBI and the NPCI that empowers users to share their data through a Consent Manager.¹³ DEPA accords individuals control over their personal data and facilitates the seamless and secure sharing of this data with third-party service providers. DEPA is designed to enable the portability of user data between different service providers while ensuring privacy and security as data cannot be stored, and is instead transferred by ‘go-betweens’ or ‘fiduciaries’.¹⁴ The architecture involves the creation of consent-based data-sharing mechanisms, allowing individuals to selectively share their data with authorised entities. This is a very different model to data governance seen in other countries, where data aggregators tend to offer services in exchange for data which is then sold.¹⁵

These key layers of the India Stack have brought economic and social impact at an unmatched scale anywhere else in the world.¹⁶ The India Stack has contributed to financial inclusion by providing a secure and accessible platform for digital transactions. This has enabled millions of Indians, including those in rural areas who make up 64 percent of the population,¹⁷ to participate in the formal economy.

Prior to the India Stack and DPI, there was no central digital identification system in the country. The fragmented, paper-based identification systems that did exist have been described as “systematically tainted”¹⁸ and excluded the most vulnerable who could not afford to pay bribes, among other fraudulent activities.¹⁹ Alongside the lack of digital ID, in 2016 Prime Minister Narendra Modi demonetised 500 and 1,000-rupee notes, taking more than 86 percent of cash out of circulation. At the time, the prime minister was heavily criticised for demonetising an economy where 90 percent of the population, especially women and the poor, relied on cash payments.²⁰ In an article for the *Harvard Business Review*, Bhaskar Chakravorti described it as “Modi’s war on cash” and asked whether the forced digitisation of India would work; fast forward to 2024 and the answer is yes, it did.²¹

The Global Opportunity for the India Stack

The India Stack, and particularly the UPI, have not only transformed India's financial system but also hold immense potential for influencing the global economy. As the landscape of global finance is undergoing a paradigm shift, with technological innovations reshaping traditional systems, the India Stack has enabled the country to leapfrog legacy financial and payments systems of developed countries. Furthermore, the Indian diaspora is the world's largest,²² and is therefore driving demand for international access to UPI for easier trade, tourism, international entrepreneurship, and cross-border remittances.²³ International markets including Singapore,²⁴ the United Arab Emirates,²⁵ Bhutan,²⁶ Sri Lanka,²⁷ and France²⁸ have all either adopted or are looking to adopt UPI technology.

Indeed, the economic and strategic case for greater integration with India makes sense. India is the world's fifth largest economy, with a nominal GDP of US\$3.3 trillion.²⁹ The population of 1.4 billion, which is the largest of any country, are young and have considerable potential. The economy is also growing at a very fast rate of around 6-8 percent annually and will soon be the world's fastest growing large economy. The consumer and aspirational classes are also growing, and they have increased demands for goods, services and education. The macroeconomic story of India is remarkable, and the result of smart policy decisions from economic liberalisation starting in the 1980s. This has lifted tens of millions of people out of poverty, and infant mortality and life expectancy have improved.³⁰ India's diaspora is spread across the world with significant populations in West Asia, Southeast Asia, North America, Africa, and Australia. They make an enormous contribution to the global economy, whether they are sending home remittances from the Gulf or running multinational companies in the United States.³¹

This is all against a backdrop of increasing global strategic competition and a push for greater economic diversification and reduced trade reliance on China. It is no wonder, then, that countries around the world are starting to look to greater integration with the India Stack.

The Singapore example is one that developed countries can consider for experience in bringing the UPI into global markets. Singapore is a developed and advanced economy with a large Indian migrant population and Non-Resident Indians (NRIs). Both countries were seeking ways to build digital infrastructure that could deliver faster, cheaper, cross-border payments that

The Global Opportunity for the India Stack

could accommodate future volumes of remittance traffic.³² Doing this required an extensive partnership between the Monetary Authority of Singapore (MAS), the RBI, and both countries' payment system operators, payment scheme owners, and participating banks and non-bank financial institutions.³³

In February 2023 the MAS and RBI signed a Memorandum of Understanding where, unlike at similar such events typically characterised by political formalities, the prime ministers of the two countries transferred money to each other in real-time from their respective locations. This could be achieved through bilateral cooperation between both private sector and government actors and demonstrates how developed countries can integrate their payment systems with the India Stack. As UPI integration scales in Singapore, there remains enormous potential for non-Indian diaspora to access the Indian financial system through the UPI where there is both political will and innovation.

“The India Stack has enabled the country to leapfrog legacy financial and payments systems of developed countries.”

Recommendations for International Adoption of the India Stack

To unlock the potential of economic integration and trade with India, international markets need to make structural changes in how they approach international payments with the country. International transfers to India, as with other countries, can be slow and bureaucratic; in contrast, domestic payments in India are fast, efficient, and low-cost. The India Stack and UPI has accelerated India's economy and has opened the banking system for over a billion people—it is this scale that can benefit both developed and developing countries the world over. There are a number of lessons that global markets and governments can learn from India's DPI experience:

- 1. Integrating the India Stack requires political ambition.** The India Stack required ambitious political leadership to implement, and a coalition of willing participants to support this vision. While the foundations of DPI started under the previous administration, it was carried through and improved under Prime Minister Modi. There were clear points when the prime minister made consequential—and contentious—decisions such as demonetisation, that brought such a large population online rapidly. Political will to bring together the key stakeholders such as central banks, payments authorities, and the private sector is needed to drive integration into existing payments systems. Cooperation can also lead to strengthened digital payments systems that reduce potential for fraudulent transactions.³⁴
- 2. A bottom-up approach can help build comprehensive digital public infrastructure ecosystems.** While integration of elements of the India Stack is possible, as seen in the Singapore example, a bottom-up approach can facilitate widespread, comprehensive adoption of DPIs while fostering innovation and competition in financial services. Where digital identification can underpin payments and the future of data privacy and consent, scaling the integration of UPI is possible.
- 3. UPI integration is critical for unlocking the India economic opportunity.** Integrating into the payments systems that is used by 1.4 billion Indians and businesses all over the country, will enable better flow of money—and people—across borders as is already seen in Singapore. Whether this is through e-commerce, trade, entrepreneurship, remittances, education, or tourism, adapting to how the Indian economy functions will have positive flow-on effects to international markets. Any country with a significant Indian diaspora should be considering how its central bank can cooperate with India to provide the framework for UPI integration.

Recommendations for International Adoption of the India Stack

4. **Interoperability and standardisation are fundamental to unlocking digital public infrastructure.** Maximising the potential of digital public infrastructure requires interoperability and standardisation. One of the key successes of the India Stack is its public railways of digital approach, where open-source technology means there is an even playing field for innovators to create software that is competitive. Interoperability and standardisation will streamline global trade and cross-border payments with India.

“Integrating the India Stack
requires political ambition.”

The India Stack may seem like an overnight success story yet was one that took ten years to build. Any observer of or participant in India's economy over the last decade would have witnessed a transformation not seen anywhere else globally. Today, the world's largest country by population is structured around the India Stack, and particularly its UPI. This has led to widespread financial inclusion across the country, which is an essential element of the India growth story.

While countries look to India for economic diversification and with the huge Indian diaspora across the globe, there is both a demand and a need for integration into the Indian economic payments systems. This is significant, because there is no other similar comprehensive structural transformation in a developing country that developed countries are looking to adopt. India has jumped ahead of traditional payments models in advanced economies through its bottom-up approach to digital public infrastructure. To respond to this transformation, other countries and markets will need to adapt to India—and not the other way around—if they truly want to move beyond “just looking like a wow”, when looking at the India economic opportunity. [ORF](#)

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Dr. Erin Watson is Director at Mandala Partners and Adjunct Research Fellow at the Griffith Asia Institute. [@dr_erinwatson](#)

- 1 Yan Carrière-Swallow, Vikram Haksar, and Manasa Patnam, “Stacking Up Financial Inclusion Gains in India,” IMF, July 2021, <https://www.imf.org/external/pubs/ft/fandd/2021/07/india-stack-financial-access-and-digital-inclusion.htm>
- 2 DFAT, “India Economic Strategy: Chapter 18,” Australian Government, <https://www.dfat.gov.au/publications/trade-and-investment/india-economic-strategy/ies/chapter-18.html#:~:text=India%20has%20the%20largest%20diaspora,origin%20spread%20across%20146%20countries.>
- 3 Astha Kapoor and Erin Watson, “Defining the Digital Public Infrastructure Approach,” T20 India, 2023, <https://t20ind.org/research/defining-the-digital-public-infrastructure-approach/>
- 4 India Stack, “FAQ,” <https://indiastack.org/faq.html>
- 5 IE Insights, “India’s DPI Success: A Global Blueprint,” October 2023, <https://www.ie.edu/insights/articles/indias-dpi-success-a-global-blueprint/>
- 6 UNDP, “Inspiring Collective Action: Digital India Sets the Stage for G20,” February 2023, <https://www.undp.org/news/inspiring-collective-action-digital-india-sets-stage-g20>
- 7 Government of India, “Aadhaar Dashboard,” https://uidai.gov.in/aadhaar_dashboard/index.php
- 8 Shawn Hunter, Adele Webb, and Erin Watson-Lynn, *Policy Guidebook: Harnessing Digital Technology for Financial Inclusion in Asia and the Pacific*, UN ESCAP, March 2022, <https://www.unescap.org/kp/2022/policy-guidebook-harnessing-digital-technology-financial-inclusion-asia-and-pacific>
- 9 The Economic Times, “Over 50 Cr Jan Dhan Accounts Opened in Past 9 Years; Total Deposits Cross Rs 2 Lakh Cr,” <https://economictimes.indiatimes.com/news/economy/finance/over-50-cr-jan-dhan-accounts-opened-in-past-9-years-total-deposits-cross-rs-2-lakh-cr/articleshow/103091780.cms#>
- 10 World Bank, “Findex 2021 India Country Brief,” 2021, <https://thedocs.worldbank.org/en/doc/4c4fe6db0fd7a7521a70a39ac518d74b-0050062022/original/Findex2021-India-Country-Brief.pdf>
- 11 Government of India, “Monthly Metrics,” Government of India, 2023, <https://www.npci.org.in/statistics/monthly-metrics>
- 12 National Payments Corporation of India (NPCI), <https://www.npci.org.in>
- 13 India Stack, “Data,” October 2023, <https://indiastack.org/data.html>
- 14 IMF, “India Stack: Financial Access and Digital Inclusion,” July 2021, <https://www.imf.org/external/pubs/ft/fandd/2021/07/india-stack-financial-access-and-digital-inclusion.htm>.
- 15 IMF, “India Stack: Financial Access and Digital Inclusion”

- 16 Cristian Alonso et al., *Stacking up the Benefits: Lessons from India's Digital Journey*, International Monetary Fund, March 2023, <https://www.imf.org/-/media/Files/Publications/WP/2023/English/wpica2023078-print-pdf.ashx>.
- 17 World Bank, "Rural Population (% of Total Population) – India," 2023, <https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?locations=IN>.
- 18 Tim O'Callahan, "What Happens When Billion Identities are Digitized," March 2020, <https://insights.som.yale.edu/insights/what-happens-when-billion-identities-are-digitized>
- 19 O'Callahan, "What Happens When Billion Identities are Digitized"
- 20 Bhaskar Chakravorti, "India's Botched War on Cash," Harvard Business Review, December 2016, <https://hbr.org/2016/12/indias-botched-war-on-cash>.
- 21 Chakravorti, "India's Botched War on Cash"
- 22 DFAT, "India Economic Strategy: Chapter 18"
- 23 NPCI, "UPI PayNow - NPCI International," 2023, https://www.npci.org.in/who-we-are/group-companies/npci-international/upi-paynow?TSPD_101_R0=08d1fc67a6ab20003d8994ae2ff4fabd7758be7b06ff046ee528bd3e04ba113c69f91f7ce618d2008dacc4730143000cd9c3ed1a33e5d6ec0b6848cdf43afa355f048d48c0f86cc71a857749309b33115bc6736ccdada5c62247fb8abc49231b.
- 24 MAS, "Launch of Real-Time Payments Between Singapore and India," February 2023, <https://www.mas.gov.sg/news/media-releases/2023/launch-of-real-time-payments-between-singapore-and-india>.
- 25 Finextra, "UAE to Launch National Domestic Card Scheme," October 2023, <https://www.finextra.com/newsarticle/43137/uae-to-launch-national-domestic-card-scheme>.
- 26 The Indian Express, "Bhutan Becomes the First Neighbouring Country to Use BHIM UPI," July 2021, <https://indianexpress.com/article/business/bhutan-becomes-the-first-neighbouring-country-to-use-bhim-upi-7403970/>
- 27 The Economic Times, "India and Sri Lanka Working Together to Link UPI and Lanka Pay: PM Modi," October 2023, <https://economictimes.indiatimes.com/industry/banking/finance/banking/india-and-sri-lanka-working-together-to-link-upi-and-lanka-pay-pm-modi/articleshow/104417986.cms>.
- 28 Livemint, "UPI in France: UPI to Go Live in France in Three to Four Months, Says NIPL CEO Ritesh Shukla," July 2023, <https://www.livemint.com/news/india/upi-in-france-upi-to-go-live-in-france-in-three-to-four-months-says-nipl-ceo-ritesh-shukla-11689741994629.html>.
- 29 World Bank, "GDP – Current USD," 2023, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?most_recent_value_desc=true

Endnotes

- 30 DFAT, “India Economic Strategy: Chapter 1,” <https://www.dfat.gov.au/publications/trade-and-investment/india-economic-strategy/ies/chapter-1.html>.
- 31 DFAT, “India Economic Strategy: Chapter 18”
- 32 MAS, “Launch of Real-Time Payments Between Singapore and India”
- 33 MAS, “Launch of Real-Time Payments Between Singapore and India”
- 34 Divya Bhati, “More Than 95,000 UPI Fraud Cases Reported in 2022, Here is How You Can Stay Safe,” *India Today*, May 2023, <https://www.indiatoday.in/technology/news/story/more-than-95000-upi-fraud-cases-reported-in-2022-here-is-how-you-can-stay-safe-2386084-2023-05-29>



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20, Rouse Avenue Institutional Area,
New Delhi - 110 002, INDIA

Ph. : +91-11-35332000. Fax : +91-11-35332005

E-mail: contactus@orfonline.org

Website: www.orfonline.org