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India and ASEAN in the Digital Economy: Trade, Technology, and Regional Integration

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Abstract

Digital technologies are transforming patterns of trade, investment, and economic cooperation across Asia, creating new opportunities for regional integration. Within this context, digital engagement between India and the Association of Southeast Asian Nations (ASEAN) has become increasingly significant. This paper examines the evolving structure of India–ASEAN digital and technological cooperation across several dimensions of the digital economy, including trade in information and communication technology (ICT) goods, digitally delivered services, fintech linkages, venture capital flows, and digital governance frameworks. The analysis highlights a complementary pattern in the bilateral digital relationship. ASEAN economies play a central role in global electronics manufacturing and semiconductor supply chains, while India's strengths lie in software development, digital services exports, and large-scale digital public infrastructure systems. Singapore emerges as a key intermediary linking India's technology ecosystem with regional financial markets and innovation networks. At the same time, differences in digital readiness, infrastructure, and regulatory frameworks across economies continue to shape the scope of deeper integration. The paper concludes that strengthening digital trade frameworks, cross-border payment connectivity, and startup ecosystem linkages could play an important role in deepening India–ASEAN digital cooperation within the broader Indo-Pacific digital economy.

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India and ASEAN in the Digital Economy: Trade, Technology, and Regional Integration

1. Introduction

Digital technologies are reshaping patterns of trade, investment, and economic cooperation across Asia. Over the past decade, the rapid expansion of digital platforms, e-commerce, cloud computing, and digital financial services has transformed the structure of regional economic integration (World Bank, 2021; OECD, 2020). Southeast Asia has emerged as one of the fastest-growing digital economies in the world. According to estimates by Google, Temasek, and Bain & Company, the region's digital economy surpassed US$200 billion in gross merchandise value in 2022 and is expected to continue expanding rapidly in the coming decade (Google, Temasek & Bain, 2023). At the same time, ASEAN governments have increasingly prioritised digital integration as part of broader regional economic cooperation initiatives (ASEAN Secretariat, 2023).

Within this context, digital engagement between India and ASEAN has taken on growing strategic and economic importance. India has emerged as a major global hub for information technology services, digital platforms, and large-scale digital public infrastructure systems (World Bank Group, 2025). Initiatives such as the Unified Payments Interface (UPI), Aadhaar digital identity system, and other components of India's digital infrastructure have significantly expanded digital connectivity and financial inclusion within the country (Reserve Bank of India, 2024; World Bank Group, 2025). At the same time, ASEAN economies play a central role in global electronics and semiconductor supply chains, making the region an important partner for India's expanding digital economy (World Trade Organization, 2023). As both sides deepen their participation in regional digital markets, opportunities for cooperation in areas such as digital trade, fintech, and technology investment have increased.

Digital cooperation has also become increasingly relevant in the broader geopolitical and institutional landscape of the Indo-Pacific. ASEAN has been advancing regional initiatives aimed at strengthening digital economic integration, including negotiations on the ASEAN Digital Economy Framework Agreement (DEFA) (ASEAN Secretariat, 2023). At the same time, India has sought to expand its economic and technological partnerships across the Indo-Pacific as part of its broader regional engagement strategy. Strengthening digital connectivity and technological collaboration between India and ASEAN therefore has implications not only for economic growth but also for the evolving architecture of the regional digital economy.
Despite growing policy attention, however, the structure and scope of digital engagement between India and ASEAN remain relatively underexplored in the policy literature. Existing discussions often focus either on India's domestic digital transformation or on ASEAN's regional digital economy initiatives, with limited analysis of the interaction between the two. Understanding the patterns of trade, investment, and technological cooperation linking India and ASEAN is therefore important for identifying both opportunities and constraints in the emerging digital partnership.

This paper provides a descriptive overview of India–ASEAN digital and technological cooperation across several dimensions of the digital economy. It addresses three main questions. First, what are the current patterns of digital and technology-related engagement between India and ASEAN? Second, where do opportunities exist for deeper digital integration between the two sides? Third, what structural factors may constrain the expansion of this relationship? By examining trends in digital trade, services exports, fintech cooperation, investment flows, and digital governance frameworks, the paper aims to provide a clearer

picture of the evolving India–ASEAN digital economic relationship and its implications for regional cooperation. The analysis presented in this paper highlights a complementary structure in the India–ASEAN digital relationship. ASEAN economies play a central role in global electronics manufacturing and semiconductor supply chains, while India's strengths lie in software development, digital services exports, and digital public infrastructure platforms. At the same time, Singapore acts as a key intermediary linking India's technology ecosystem with regional capital markets and innovation networks. These patterns create opportunities for deeper regional integration but also highlight differences in digital readiness and regulatory frameworks across economies.

The remainder of the paper is organised as follows. Section 2 outlines the conceptual framework used to analyse digital cooperation between India and ASEAN, highlighting key dimensions such as trade in digital goods and services, fintech linkages, investment flows, and digital governance frameworks. Section 3 examines patterns in ICT goods trade between India and ASEAN, focusing on the structure and evolution of regional digital hardware supply chains. Section 4 turns to digital services trade, analysing India's role as a provider of software and IT-enabled services to Southeast Asian markets. Section 5 explores emerging cooperation in digital public infrastructure and fintech, including cross-border payment connectivity initiatives. Section 6 discusses investment linkages and startup ecosystem connections between India and ASEAN, with particular attention to the role of Singapore as a regional financial and innovation hub. Section 7 compares digital governance frameworks across India and ASEAN economies, while Section 8 highlights structural constraints such as differences in digital readiness and infrastructure. Section 9 situates these developments within the broader strategic context of the Indo-Pacific digital economy. Finally, Section 10 outlines policy implications for strengthening India–ASEAN digital cooperation, and Section 11 concludes.

2. Conceptualising Digital Cooperation

Digital cooperation between economies can take multiple forms, reflecting the broad scope of activities encompassed within the digital economy. Unlike traditional sectors of trade and investment, digital economic engagement spans goods, services, financial technologies, data flows, and regulatory frameworks. International organisations such as the World Bank and the Organisation for Economic Co-operation and Development increasingly emphasise that the digital economy includes not only digitally delivered services but also the infrastructure, platforms, and regulatory systems that enable digital transactions and cross-border data flows (OECD, 2020; World Bank, 2021). In the context of India–ASEAN relations, digital cooperation can therefore be understood as encompassing several interconnected dimensions.
One important dimension involves trade in digital and information technology goods. ICT products—including telecommunications equipment, semiconductors, and electronic components—form the physical backbone of the digital economy. Southeast Asia has become an increasingly important manufacturing hub for these products, particularly as global electronics production networks have expanded across countries such as Vietnam, Malaysia, and Thailand (World Trade Organization, 2023). Trade in ICT goods therefore represents a key channel through which India participates in regional digital supply chains.

A second dimension involves trade in digitally deliverable services. Services such as software development, IT consulting, cloud computing support, and other digitally delivered business services have become major components of international trade. India has established a strong global position in this sector, supported by a large and internationally integrated IT services industry. As ASEAN economies expand their digital infrastructure and online services, demand

for such services has increased, creating new opportunities for cross-border digital services trade between India and Southeast Asia (World Trade Organization, 2023; OECD, 2020).

A third area of digital cooperation involves financial technology and digital payments systems. Digital public infrastructure platforms—including payment networks, digital identity systems, and online financial services—are increasingly viewed as foundational components of modern digital economies (World Bank Group, 2025). India's development of large-scale digital payment systems such as the Unified Payments Interface has attracted international attention as a model for expanding financial inclusion and digital financial services (Bank for International Settlements, 2023). Cross-border payment connectivity initiatives linking India's payment platforms with those of ASEAN economies represent an emerging channel of digital economic integration.

Beyond trade and financial technologies, digital cooperation also encompasses investment flows, startup ecosystems, and digital innovation networks. Venture capital investment, technology partnerships, and startup expansion across borders have become important drivers of digital economic linkages across Asia. Singapore, in particular, plays a key role as a regional financial and innovation hub connecting investors with technology ecosystems across the wider region, including India (Asian Development Bank, 2023).

Finally, digital cooperation is shaped by the regulatory and governance frameworks that govern data protection, cybersecurity, cross-border data flows, and emerging technologies. As digital trade expands, differences in national regulatory regimes can create both opportunities and constraints for cross-border digital activity. Regional initiatives such as ASEAN's digital economy cooperation frameworks, alongside national regulatory developments in India, therefore play an important role in shaping the institutional environment within which India–ASEAN digital engagement evolves (ASEAN Secretariat, 2023).

Taken together, these dimensions provide a conceptual framework for analysing digital cooperation between India and ASEAN. The following sections examine how these various channels—trade in digital goods and services, fintech cooperation, investment linkages, and digital governance frameworks—are shaping the emerging digital economic relationship between the two sides.

3. Digital Trade Patterns

Digital trade between India and ASEAN has expanded significantly over the past decade, reflecting the growing integration of the two economies into regional technology supply chains. Trade in information and communication technology (ICT) goods provides an initial indicator of this relationship. As shown in Table 1, total ICT trade between India and ASEAN increased from approximately US$4.8 billion in 2015 to around US$17 billion in 2024. This expansion has been driven primarily by rising imports of electronic components, telecommunications equipment, and other digital hardware from Southeast Asia into India's rapidly growing digital economy. At the same time, India's exports of ICT goods to ASEAN remain relatively modest. As a result, the bilateral digital goods relationship is characterised by a persistent and widening trade deficit for India in this sector.

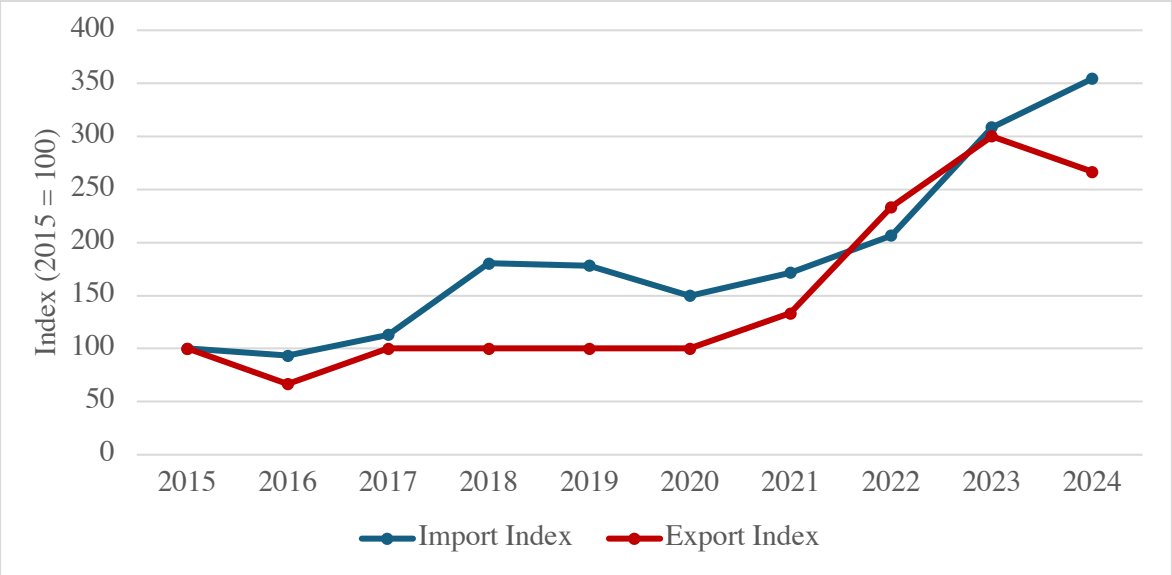
Table 1. India–ASEAN Trade in ICT Goods

Year	ICT Imports from ASEAN	ICT Exports to ASEAN	Total ICT Trade	Trade Balance
2015	4.6	0.3	4.8	-4.3
2016	4.3	0.2	4.6	-4.1
2017	5.2	0.3	5.5	-4.9
2018	8.3	0.3	8.6	-8.1
2019	8.2	0.3	8.5	-7.9
2020	6.9	0.3	7.2	-6.6
2021	7.9	0.4	8.4	-7.5
2022	9.5	0.7	10.2	-8.8
2023	14.2	0.9	15.0	-13.3
2024	16.3	0.8	17.0	-15.5

Source: Author calculations using UN Comtrade data.
Note: Values reported in current US$ billions.

The growth trajectory of ICT goods trade is illustrated in Figure 1, which presents an index of imports and exports with 2015 as the base year. The figure shows that ICT imports from ASEAN have increased sharply over the period, particularly after 2018, reflecting the expansion of regional electronics production networks. By contrast, India's ICT exports to ASEAN have grown more slowly and from a much smaller base. By 2024, imports were more than three times their 2015 level, while exports, although rising in recent years, remain comparatively limited. This divergence highlights the complementary structure of the India–ASEAN digital economy: ASEAN economies play a central role in the manufacturing and export of digital hardware, while India's digital strengths lie more strongly in software, services, and digital platforms.

Figure 1. India–ASEAN ICT Goods Trade (Index, 2015 = 100)



Source: Author calculations using UN Comtrade data.

The concentration of India–ASEAN ICT trade across a small number of regional partners further illustrates the structure of these supply chains. Table 2 shows that five ASEAN economies account for the overwhelming majority of ICT goods trade with India. Vietnam alone represents more than one-third of India's ICT trade with the region, followed by Malaysia and Singapore. Together, these economies account for nearly four-fifths of total ICT goods trade between India and ASEAN. This pattern reflects the strong integration of these economies into global electronics production networks, particularly in semiconductors, consumer electronics, and digital components. Singapore's role is somewhat distinct, reflecting its position not only as a technology hub but also as a regional trade and investment gateway linking India with wider global digital markets.

Table 2. India's Major ASEAN Partners in ICT Goods Trade (2024)

Country	ICT Imports from country	ICT Exports to country	Trade Balance	Total ICT Trade	Share (%)
Vietnam	3067.6	58.6	-3009.0	3126.3	36.7
Malaysia	2008.9	79.1	-1929.8	2088.1	24.5
Singapore	1409.5	132.9	-1276.7	1542.4	18.1
Thailand	1263.4	67.6	-1195.8	1331.0	15.6
Philippines	335.1	9.8	-325.3	345.0	4.0

Source: Author calculations using UN Comtrade data.
Note: Values reported in current US$ millions.

While ASEAN economies play a dominant role in supplying ICT hardware and electronic components to India, the structure of digital engagement between the two sides is more balanced when services trade is considered. India's comparative advantage lies less in the manufacturing of digital goods and more in the provision of software, information technology services, and digitally deliverable business services. As digitalisation accelerates across Southeast Asia, demand for such services—including cloud computing, software development, and IT-enabled services—has expanded significantly. Examining trade in ICT-related services therefore provides an important complementary perspective on India–ASEAN digital integration. The following section analyses patterns in digital services trade between India and ASEAN, highlighting the growing role of services exports in shaping the broader digital economic relationship.

4. Digital Services Trade

While ICT goods trade highlights ASEAN's role as a manufacturing hub within regional technology supply chains, the structure of digital engagement between India and Southeast Asia appears different when services trade is considered. India has developed a strong comparative advantage in software and information technology services, supported by a large pool of skilled professionals and an established export-oriented IT services industry. As digitalisation expands across ASEAN economies, demand for such services—including software development, IT consulting, cloud infrastructure support, and digital platform services—has increased steadily. Table 3 presents trends in India–ASEAN trade in ICT-related services, including telecommunications and computer services. The data indicate that services

trade between India and ASEAN has grown consistently over the past decade, with exports expanding particularly rapidly in computer services.

Table 3. India–ASEAN Trade in ICT-Related Services

Year	Telecom Exports	Telecom Imports	Compute r Exports	Computer Imports	Share of computer services in ICT services
2015	85	69	2313	217	96.5%
2016	90	103	2495	402	96.5%
2017	96	79	2656	413	96.5%
2018	108	92	3027	482	96.6%
2019	135	101	3343	558	96.1%
2020	121	126	3837	693	96.9%
2021	143	165	4792	914	97.1%
2022	153	156	4989	1127	97.0%
2023	174	219	5345	1028	96.8%
2024	130	172	6675	1338	98.1%

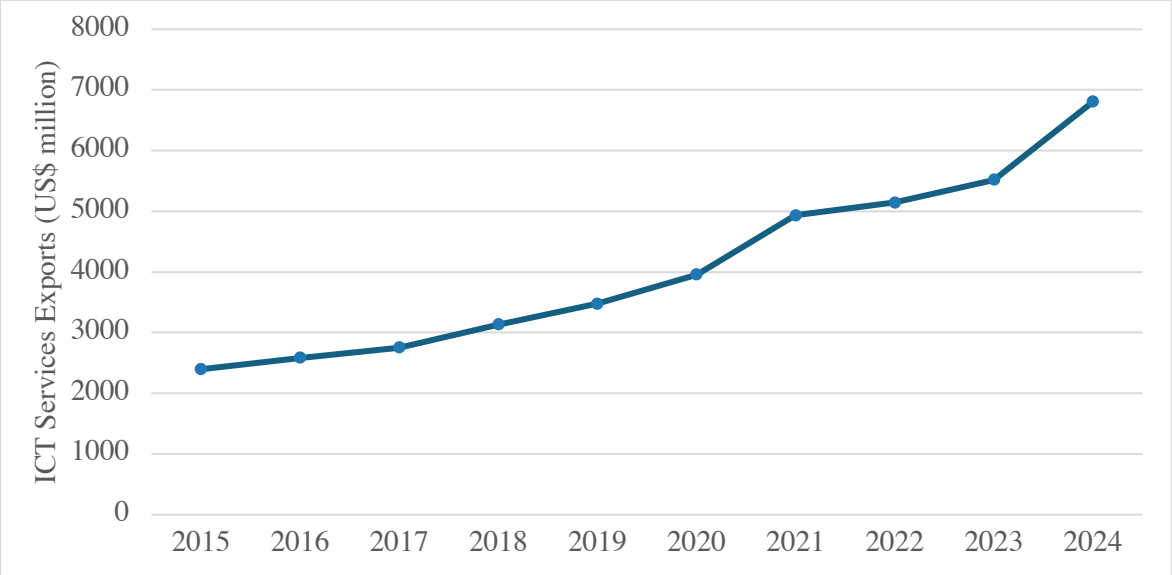
Unit: US$ million
Source: Author calculations using data from the World Trade Organization Trade in Services database.

A striking feature of India's services engagement with ASEAN is the dominance of computer services in the export basket. As shown in Table 3, computer services account for more than 95 percent of India's ICT-related services exports to ASEAN throughout the period, rising from approximately US$2.3 billion in 2015 to more than US$6.6 billion by 2024. Telecommunications services exports, while growing gradually, remain comparatively small. This composition reflects India's established position in global IT services and business process outsourcing markets, where Indian firms provide software development, digital infrastructure management, and technology consulting services to companies and institutions across Southeast Asia.

The growth trajectory of these exports is illustrated in Figure 2, which shows the expansion of India's ICT services exports to ASEAN over the past decade. Total exports increased from roughly US$2.4 billion in 2015 to nearly US$6.8 billion in 2024, representing almost a threefold increase over the period. This growth mirrors the broader digital transformation underway across ASEAN economies, where expanding internet penetration, digital platform adoption, and e-commerce activity are increasing demand for technology services. India's services sector has been well positioned to meet this demand, allowing Indian firms to deepen their engagement with ASEAN markets even as goods trade remains structurally imbalanced.
Taken together, the patterns observed in goods and services trade highlight the complementary nature of the India–ASEAN digital economic relationship. While ASEAN economies play a central role in the production and export of ICT hardware, India's strengths lie in software development and digitally deliverable services. This hardware–software complementarity creates opportunities for deeper digital integration across the region, particularly as digital

infrastructure, cloud services, fintech platforms, and cross-border data services become increasingly important components of regional economic cooperation.

Figure 2. Growth of India–ASEAN ICT Services Exports, 2015–2024



Unit: US$ million
Source: Author calculations using WTO Trade in Services statistics.

5. Digital Public Infrastructure and FinTech Cooperation

Beyond trade in digital goods and services, India–ASEAN digital engagement is increasingly shaped by cooperation in digital public infrastructure (DPI) and financial technology. Over the past decade, India has developed one of the world's largest digital payment ecosystems, anchored by platforms such as the Unified Payments Interface (UPI) (Reserve Bank of India, 2024; Bank for International Settlements, 2023). These systems enable real-time retail payments and support a wide range of digital financial services, including peer-to-peer transfers, merchant payments, and government transfers. As ASEAN economies expand their own digital payment systems, opportunities have emerged to link national platforms and facilitate faster and cheaper cross-border transactions. Table 4 summarises the current and emerging payment linkages between India and several ASEAN economies.

Among these initiatives, the linkage between India's UPI system and Singapore's PayNow platform represents the most advanced example of cross-border digital payment integration in the region (Monetary Authority of Singapore & Reserve Bank of India, 2023). Launched in 2023 through cooperation between the Reserve Bank of India and the Monetary Authority of Singapore, the system allows users in both countries to transfer funds in real time using mobile numbers or virtual payment addresses. This development reflects broader efforts to promote regional payment connectivity, an initiative also being pursued by several ASEAN central banks through the ASEAN Regional Payment Connectivity framework. Other ASEAN economies, including Malaysia and Thailand, have begun exploring potential interoperability between their national payment systems and India's digital payments infrastructure.

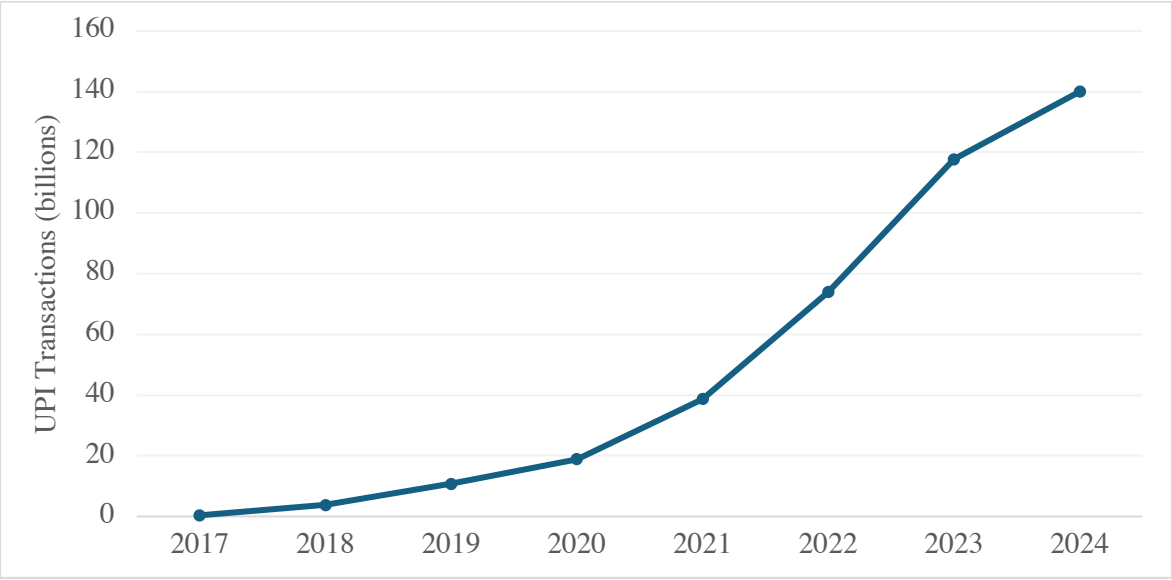
Table 4. Cross-Border Digital Payment Linkages Between India and ASEAN

Country	Payment System	Link with India	Launch / Status
Singapore	PayNow	Linked with UPI for real-time cross-border payments	Launched 2023
Malaysia	DuitNow	Potential interoperability with UPI	Partially rolled out
Thailand	PromptPay	Potential future linkage with UPI	Under discussion
Indonesia	BI-FAST	Exploratory cooperation discussions	Exploratory
Philippines	InstaPay / PESONet	Potential cooperation on cross-border payments	Exploratory

Source: Author compilation based on central bank announcements (Reserve Bank of India; Monetary Authority of Singapore; ASEAN central bank communications).

The rapid expansion of India's domestic digital payment ecosystem provides important context for these cross-border initiatives. As illustrated in Figure 3, the volume of UPI transactions has grown dramatically since its introduction (National Payments Corporation of India, 2024), increasing from fewer than half a billion transactions in 2017 to well over 100 billion transactions annually by the early 2020s. This scale makes UPI one of the largest real-time payment systems in the world. The widespread adoption of digital payments within India has strengthened the credibility of the country's DPI model and increased interest among regional partners in exploring similar systems or potential interoperability.

Figure 3. Expansion of India's Digital Payments Ecosystem: UPI Transactions, 2017–2024



Source: Author compilation using Reserve Bank of India and National Payments Corporation of India (NPCI) payment statistics.

For ASEAN economies, cooperation with India in digital payments and fintech may offer several advantages. Linking payment systems can reduce transaction costs, facilitate cross-border e-commerce, and improve financial connectivity for migrant workers, tourists, and small businesses operating across the region. At the same time, such cooperation complements the broader digital economic relationship between India and ASEAN, where digital services,

technology platforms, and financial technologies are becoming increasingly important drivers of regional integration. As more ASEAN economies develop real-time payment systems and digital financial infrastructure, the scope for deeper fintech collaboration with India is likely to expand further.

6. Startup Ecosystem and Venture Capital Linkages

In addition to trade and digital infrastructure cooperation, investment linkages have become an increasingly important channel connecting the digital economies of India and ASEAN. Over the past decade, India has emerged as one of the world's largest startup ecosystems, supported by a rapidly expanding digital market, a large base of technology entrepreneurs, and growing venture capital activity. ASEAN investors—particularly those based in Singapore—have played a significant role in financing India's technology sector. As shown in Table 5, Singapore accounts for the overwhelming majority of ASEAN-origin foreign direct investment into India's technology-related sectors, reflecting its position as the region's principal financial and venture capital hub.

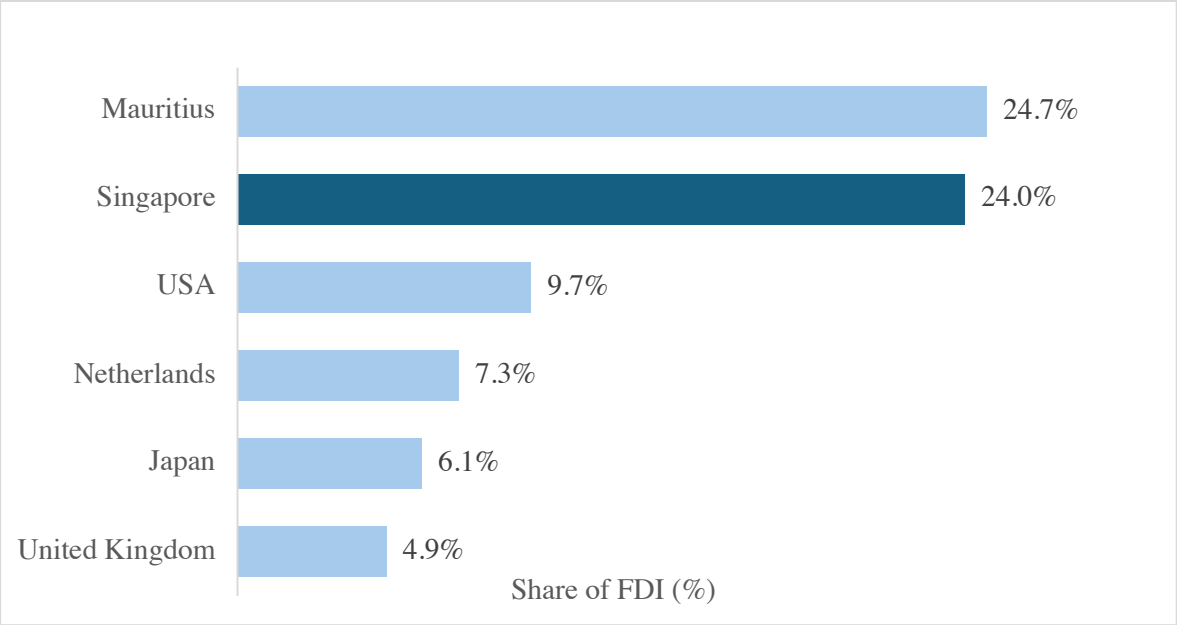
Table 5. ASEAN Investment in India's Technology Sector

Country	Total FDI into India	Share of India FDI (%)	Estimated ICT Sector FDI
Singapore	174,885.8	23.99%	37819.0
Thailand	1,478.5	0.20%	319.7
Malaysia	1,272.3	0.17%	275.1
Indonesia	659.3	0.09%	142.6
Vietnam	34.7	0.00%	7.5

Units: US$ million
Source: Author calculations using Department for Promotion of Industry and Internal Trade FDI statistics.
Note: Sector-level FDI by source country is not publicly available. Estimated ICT investment is calculated by applying country shares in total FDI to ICT-related sector inflows.

Singapore's prominence in these investment flows reflects both structural and institutional factors. The city-state serves as a regional headquarters location for many global technology investors, venture capital firms, and multinational companies operating across Asia. As a result, a significant share of capital flowing into India's startup ecosystem is routed through Singapore-based entities. This role is reflected more broadly in India's overall foreign investment patterns. As illustrated in Figure 4, Singapore has consistently ranked among the largest sources of foreign direct investment into India over the past two decades, alongside jurisdictions such as Mauritius, the United States, and the Netherlands.

Figure 4. Top Sources of FDI Inflows into India (Share %, 2000–2024)



Source: Author calculations using Department for Promotion of Industry and Internal Trade (DPIIT) FDI statistics.

These investment linkages have played an important role in strengthening technological and entrepreneurial ties between India and Southeast Asia. Singapore-based venture capital funds and technology investors have been active participants in funding Indian startups across sectors such as fintech, e-commerce, digital infrastructure, and enterprise software. At the same time, several Indian technology firms have expanded operations into Southeast Asia, viewing ASEAN markets as a natural extension of their regional growth strategies. This two-way flow of capital and business expansion has contributed to the emergence of a broader India–ASEAN digital innovation corridor.

Looking ahead, deeper collaboration between India's startup ecosystem and ASEAN's financial and technology hubs could further strengthen regional digital integration. Singapore's established role as a regional capital and innovation hub positions it as a key intermediary linking Indian technology firms with investors, partners, and markets across Southeast Asia. Expanding cross-border venture capital flows, startup partnerships, and digital entrepreneurship initiatives could therefore become an important component of the evolving India–ASEAN digital economic relationship.

7. Digital Governance and Regulatory Alignment

While trade, investment, and digital infrastructure cooperation have expanded rapidly between India and ASEAN, deeper digital integration also depends on the regulatory frameworks governing data, cybersecurity, and emerging technologies. Digital governance has become an increasingly important component of international economic cooperation, particularly as cross-border data flows and digital services play a larger role in trade and investment (World Bank, 2021; OECD, 2020). India and ASEAN economies have each developed evolving regulatory

frameworks to address issues such as data protection, digital payments oversight, cybersecurity, and artificial intelligence governance. However, these frameworks differ in scope, institutional design, and implementation approaches.

India's digital governance architecture has evolved significantly in recent years as the country has sought to regulate a rapidly expanding digital economy. The adoption of the Digital Personal Data Protection Act in 2023 represents a key milestone, establishing a national framework for data protection and consent-based data processing (Government of India, 2023). At the same time, India has pursued broader initiatives such as Digital India and ongoing discussions around a future Digital India Act to govern digital platforms and online services. These policies reflect India's effort to balance innovation and digital expansion with the need to safeguard personal data, cybersecurity, and consumer protection in an increasingly interconnected digital ecosystem.

Table 6. Comparison of Key Digital Governance Frameworks: India and ASEAN

Policy Area	India	ASEAN	Singapore
Data protection	Digital Personal Data Protection Act (2023) establishes a national framework for personal data processing and consent-based data governance.	ASEAN Framework on Personal Data Protection promotes regional principles for privacy protection and cross-border data cooperation.	Personal Data Protection Act provides comprehensive rules governing personal data collection, use, and disclosure.
Cross-border data flows	Data transfers permitted to approved jurisdictions under the Digital Personal Data Protection framework.	ASEAN Digital Economy Framework Agreement (DEFA) under negotiation to facilitate cross-border digital trade and data flows.	Generally open regime for cross-border data transfers subject to privacy safeguards.
Digital payments infrastructure	Unified Payments Interface (UPI) enables real-time retail digital payments and cross-border payment linkages.	ASEAN Regional Payment Connectivity initiative aims to integrate national fast payment systems across Southeast Asia.	PayNow real-time payment system supports instant domestic transfers and international linkages.
Cybersecurity governance	National Cyber Security Policy and institutional oversight through the Indian Computer Emergency Response Team (CERT-In).	ASEAN Cybersecurity Cooperation Strategy promotes regional information sharing and capacity building.	Cybersecurity Act establishes regulatory oversight of critical information infrastructure.
Artificial intelligence governance	Emerging policy framework including national AI strategy and ethical AI guidelines.	ASEAN Guide on AI Governance and Ethics provides voluntary regional principles for responsible AI adoption.	Model AI Governance Framework promotes responsible and trustworthy AI deployment.

Source: Author compilation based on policy documents from the Government of India, ASEAN Secretariat, and Monetary Authority of Singapore.

Across ASEAN, digital governance frameworks have developed through a combination of national regulations and regional cooperation initiatives. ASEAN member states have adopted varying approaches to issues such as data protection, cross-border data flows, and cybersecurity regulation (ASEAN Secretariat, 2023). At the regional level, initiatives such as the ASEAN Framework on Personal Data Protection and the ongoing negotiations on the ASEAN Digital Economy Framework Agreement (DEFA) aim to facilitate digital trade and strengthen regulatory cooperation across Southeast Asia. Table 6 compares selected elements of digital governance frameworks in India, ASEAN, and Singapore, illustrating both areas of convergence and continuing differences in regulatory approaches.

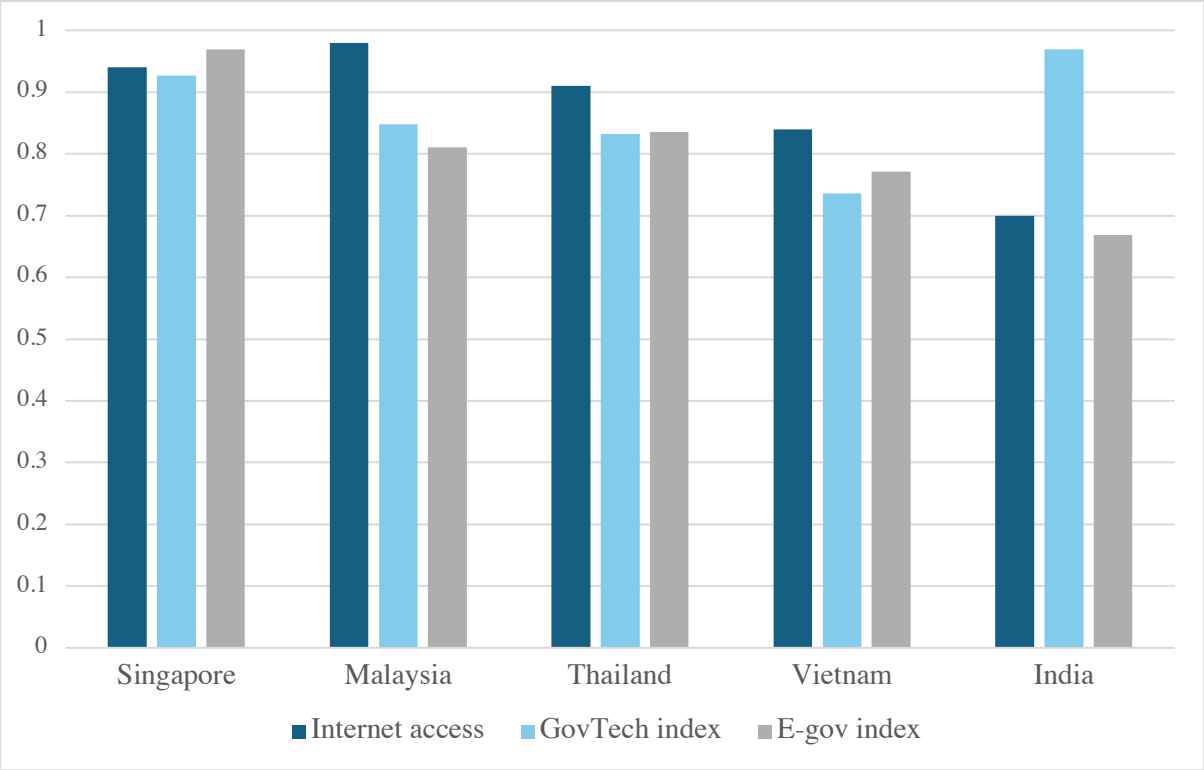
Singapore occupies a particularly important position within this landscape as one of the region's most advanced digital regulatory environments (Personal Data Protection Commission Singapore, 2023). Its Personal Data Protection Act, Cybersecurity Act, and Model AI Governance Framework have positioned the country as a leading hub for digital governance and regulatory experimentation in Asia. As India and ASEAN deepen their digital economic engagement, Singapore's experience in balancing digital innovation with regulatory oversight may provide useful reference points for regional policy coordination. At the same time, differences in regulatory frameworks across jurisdictions highlight the importance of continued dialogue and cooperation to ensure that digital trade, data flows, and emerging technologies can operate effectively across the India–ASEAN digital economy.

8. Constraints and Structural Challenges

Despite the growing scope of digital cooperation between India and ASEAN, several structural constraints continue to shape the pace and depth of regional digital integration. Differences in levels of digital infrastructure, technological capabilities, and regulatory frameworks create uneven conditions for digital trade and technology cooperation across the region. While some ASEAN economies have developed highly advanced digital ecosystems, others remain at earlier stages of digital development. These disparities influence both the scale of digital economic engagement with India and the types of collaboration that are feasible across different markets.

Figure 5 illustrates selected indicators of digital readiness across India and several ASEAN economies, including internet penetration, government technology capacity, and e-government development. The data reveal substantial variation within the region. Singapore stands out as a global leader in digital governance and government digitalisation, while countries such as Malaysia and Thailand also demonstrate relatively high levels of digital infrastructure and institutional readiness. By contrast, other economies—including some emerging ASEAN markets—continue to face challenges related to digital connectivity, technological capacity, and institutional coordination.

Figure 5. Digital Readiness Indicators: India and Selected ASEAN Economies



Source: Author compilation using data from the World Bank World Development Indicators and GovTech dataset, and the United Nations E-Government Survey.

India occupies an intermediate position within this landscape. While the country has achieved rapid expansion in digital services exports and digital payments infrastructure, broader indicators of digital readiness remain uneven across regions and sectors. In particular, variations in internet access, digital skills, and institutional capacity continue to shape the pace at which digital technologies are adopted across the economy. These domestic disparities affect India's ability to fully leverage regional digital opportunities and may influence the extent to which Indian digital platforms and services expand into Southeast Asian markets.

These structural differences do not necessarily prevent deeper digital cooperation between India and ASEAN, but they do shape its form. Digital collaboration may initially concentrate among economies with relatively advanced digital ecosystems, such as Singapore and Malaysia, before gradually expanding across the wider region as digital infrastructure improves. Addressing digital divides—both within ASEAN and within India—will therefore remain an important policy priority for strengthening regional digital integration and ensuring that the benefits of digital cooperation are broadly shared.

9. Strategic Context: India, ASEAN, and the Indo-Pacific Digital Order

The evolving digital relationship between India and ASEAN must also be understood within the broader strategic landscape of the Indo-Pacific technology economy. Over the past decade, digital infrastructure, semiconductor production, and emerging technologies have become central elements of economic competition among major powers. As global supply chains for electronics and digital technologies continue to shift, both India and ASEAN economies are seeking to position themselves within these emerging technological networks. Strengthening

digital cooperation between the two sides may therefore play an important role not only in economic integration but also in shaping the broader regional technology architecture.

One area where these dynamics are particularly visible is in semiconductor and electronics supply chains. Southeast Asia has become a key node in global electronics manufacturing, hosting major production facilities for semiconductors, integrated circuits, and electronic components. At the same time, India has increasingly emphasised the development of domestic semiconductor manufacturing capabilities as part of its broader industrial and digital policy agenda. Table 7 illustrates the structure of India–ASEAN trade in integrated circuits, highlighting the strong role played by countries such as Malaysia, Singapore, and Vietnam in supplying semiconductor components to the Indian market.

Table 7. India–ASEAN Trade in Integrated Circuits (HS 8542), 2024

Country	Imports	Exports	Trade Balance	Total Trade	Share (%)
Malaysia	493.1	2.8	-490.3	495.9	34.2
Singapore	452.6	10.2	-442.5	462.8	31.9
Philippines	164.1	0.2	-163.8	164.3	11.3
Vietnam	123.0	36.3	-86.8	159.3	11.0
Thailand	150.4	0.8	-149.6	151.1	10.4

Source: Author calculations using UN Comtrade.
Note: Integrated circuits defined using HS code 8542. Values reported in current US$ millions.

These patterns underscore the complementary roles that India and ASEAN economies play within regional technology supply chains. ASEAN economies—particularly Malaysia, Singapore, and Vietnam—have established themselves as important hubs for electronics manufacturing and semiconductor assembly. India, by contrast, represents both a rapidly expanding consumer market for digital technologies and a growing centre for software development and digital services. As governments across the region seek to strengthen supply-chain resilience and diversify technology partnerships, closer India–ASEAN cooperation could contribute to a more interconnected regional digital ecosystem.

For policymakers across the Indo-Pacific, these developments highlight the importance of regional collaboration in shaping the future digital economy. Digital infrastructure, semiconductor production, data governance, and technology standards are increasingly interconnected policy domains. Strengthening cooperation between India and ASEAN—particularly through initiatives such as digital trade frameworks, fintech connectivity, and technology partnerships—may therefore contribute not only to economic growth but also to the broader stability and resilience of the Indo-Pacific digital order.

10. Policy Implications for Deepening Digital Integration

The analysis presented in this paper highlights both the opportunities and the structural characteristics of the emerging digital economic relationship between India and ASEAN. Trade and investment patterns suggest a complementary structure in which ASEAN economies play a major role in the production of digital hardware and electronics, while India's strengths lie in software development, digital services, and digital public infrastructure. These complementary

capabilities create a foundation for deeper regional digital integration. However, realizing this potential will require targeted policy efforts to strengthen connectivity, reduce regulatory fragmentation, and expand cooperation across key areas of the digital economy.

One priority area is the facilitation of digital trade and cross-border data flows. As digital services and technology-enabled business activities expand across the region, ensuring interoperability between regulatory frameworks will become increasingly important. Efforts such as the ASEAN Digital Economy Framework Agreement (DEFA) and India's evolving digital governance architecture provide potential avenues for dialogue and coordination. Greater alignment on issues such as data protection standards, cybersecurity cooperation, and digital trade rules could help reduce regulatory uncertainty and support the growth of cross-border digital services.

A second area for cooperation lies in the expansion of digital public infrastructure linkages. India's experience in developing large-scale digital platforms for payments, identity, and digital transactions provides a potential model for collaboration with ASEAN economies seeking to strengthen their own digital ecosystems. Initiatives such as the cross-border linkage between India's Unified Payments Interface and Singapore's PayNow platform illustrate how digital payment systems can be integrated to facilitate cross-border transactions. Expanding similar interoperability arrangements across Southeast Asia could support regional e-commerce, tourism, and financial connectivity.

Third, strengthening collaboration between India's startup ecosystem and ASEAN's financial and innovation hubs could further deepen digital economic ties. Singapore already plays a central role in channelling venture capital into India's technology sector, and expanding these investment linkages could help foster greater cross-border innovation. Programs supporting startup partnerships, technology exchange, and digital entrepreneurship networks may enable firms in both regions to scale their operations across Asian markets.

Finally, addressing structural constraints related to digital readiness and infrastructure remains an important long-term priority. Differences in connectivity, digital skills, and institutional capacity across economies may limit the pace at which digital cooperation can expand. Policies aimed at strengthening digital infrastructure, promoting digital skills development, and supporting technology adoption will therefore play a critical role in ensuring that the benefits of regional digital integration are broadly shared. Continued dialogue between India and ASEAN policymakers, supported by regional institutions and industry stakeholders, will be essential for building a more integrated and resilient digital economy across the Indo-Pacific.

11. Conclusion

The analysis in this paper highlights the evolving nature of digital and technological engagement between India and ASEAN. Across multiple dimensions—including trade, digital services, fintech cooperation, and investment flows—the relationship has expanded significantly over the past decade. At the same time, the structure of this engagement reflects a complementary pattern within the regional digital economy. ASEAN economies play a central role in global electronics manufacturing and digital hardware supply chains, while India's strengths lie in software development, digital services exports, and large-scale digital public infrastructure platforms. This combination of capabilities creates opportunities for deeper economic integration as digital technologies become increasingly central to regional growth.

At the same time, the findings also underscore several structural factors shaping the trajectory of India–ASEAN digital cooperation. Digital engagement remains concentrated among a limited number of partners—particularly Singapore, Vietnam, and Malaysia—while differences in digital readiness, regulatory frameworks, and technological capabilities continue to influence the pace of integration across the wider region. Strengthening cooperation in areas such as digital trade governance, payment connectivity, startup investment, and technology supply chains will therefore be important for sustaining momentum in the digital partnership.

Looking ahead, the India–ASEAN digital relationship is likely to become an increasingly important component of the broader Indo-Pacific technology landscape. As governments across the region seek to strengthen digital infrastructure, diversify technology supply chains, and promote innovation-led growth, collaboration between India and ASEAN economies can contribute to a more interconnected and resilient regional digital ecosystem. Continued dialogue among policymakers, businesses, and regional institutions will play a critical role in translating these opportunities into deeper and more sustained digital integration.

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