

Chapter 8

Enabling India's E-commerce Connectivity with ASEAN: E-Payment in India – Problems and Prospects

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Enabling India's E-commerce Connectivity with ASEAN: E-payment in India - Problems and Prospects

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1. Introduction

Information and communication technology (ICT) has driven numerous socio-economic changes across the globe. This may be witnessed in the way payments are made, businesses work, and countries are governed. ICT has enabled digitalisation of a number of processes, inducing much-needed inclusiveness not just of citizens but also of businesses and government. This aspect of digitalisation was featured in the G20 Ministerial Conference in Germany in April 2017. Global trade is shifting to digital platforms as ICT spreads.

The development of online trading of goods and services, or e-commerce, catalyses socio-economic transformation. ICT connectivity provides the free flow of information and a platform for transactions. The ASEAN Economic Community Blueprint 2025 (ASEAN Secretariat, 2015a) establishes global e-commerce as a 'vital element of the global economy as part of a retailer's multi-channel strategy'. E-commerce is now part of many bilateral and plurilateral trade agreements and was discussed at the 11th World Trade Organization (WTO) Ministerial Conference in December 2017, in Argentina, on a global e-commerce mandate. However, the conference ended without any consensus as some member countries did not agree to formulate global rules for e-commerce.

Global e-commerce activities have been booming in the past few years. The E-commerce Foundation says that turnover increased from US\$1,255.5 billion in 2012 to US\$2,272.7 billion in 2015, and the share of the Asia-Pacific region during the same time increased from 31.27% to 46.50%. In the next 5–10 years, India is forecast to be amongst the top-three fastest-growing e-commerce markets in the world, with Indonesia and Malaysia. (ADB, 2016; Chen, 2017).

ICT infrastructure, however, is just one enabler of e-commerce. Logistics, e-payment, and the seamless link and harmonisation between virtual and physical networks will also drive e-commerce sustainability and growth. E-payment eases financial transactions. Logistics

infrastructure enables product delivery. Finally, connectivity between virtual and physical networks streamlines the entire process. (Chen, 2017, 2019)

This chapter reviews the status of India's e-commerce connectivity, specifically ICT and logistics, with Association of Southeast Asian Nations (ASEAN) countries, and examines India's e-payment framework. Section 1 introduces the research. Section 2 elaborates on India's e-commerce connectivity (ICT and logistics) with ASEAN countries. Section 3 examines India's e-payment framework, including government initiatives, e-payment methods, and the existing regulatory framework. Section 4 describes the link between e-payments and highlights trends in volume and value of e-payments in the last few years. Section 5 describes the challenges pertaining to e-payment and e-commerce in India, and analyses their strength, limitations, opportunities, and threats. Section 6 elaborates on e-payment connectivity between India and ASEAN. Finally, section 7 recommends ways to promote e-payment in India, which will catalyse domestic e-commerce and expand e-commerce connectivity with ASEAN countries.

2. E-commerce Connectivity in India

India had over 1.34 billion citizens and a gross domestic product (GDP) of US\$2.6 trillion in 2017. The economy is primarily driven by services, followed by manufacturing and agriculture. The largest job creators are agriculture and allied sectors. During the last decade, e-commerce has emerged as a key sector, employing a large number of people, directly and indirectly, whilst also generating substantial revenue. Snapdeal (2016: 2) says that, 'Indian electronic retailing (e-tail) market is estimated to reach US\$68.8 billion (76% of total e-commerce market) by 2020 from US\$23 billion during the financial year 2016, growing at a compound annual growth rate (CAGR) of about 31%'. Furthermore, 'e-tail and allied ecosystem is expected to create 1.45 million employment opportunities by 2021'. The phenomenal growth of Indian e-commerce is proof of consistent improvements in every dimension of e-commerce connectivity.

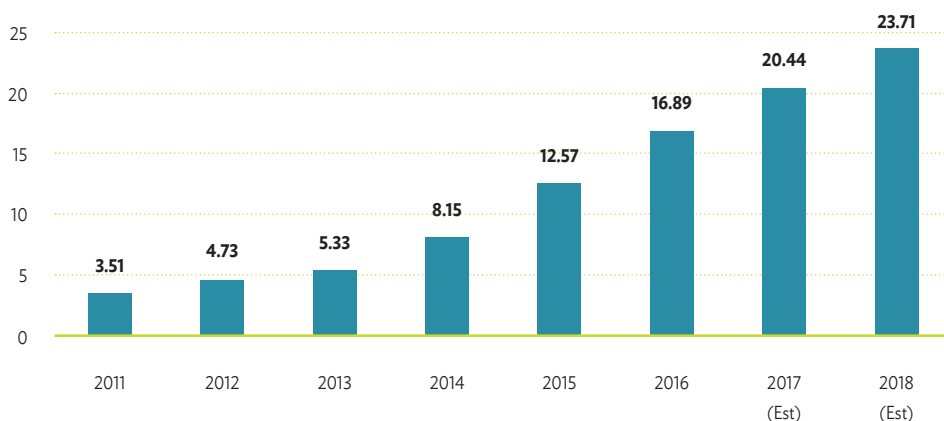
There are few e-commerce studies by the private sector, and there is not much public data on the volume and growth of e-commerce. 'India's e-commerce revenue is expected to jump from US\$30 billion in 2016 to US\$120 billion in 2020, growing at an annual rate of 51%, the highest in the world. Whilst in terms of base, India may be lower than China and other giants like Japan, the Indian rate of growth is way ahead of others. Against India's annual expansion of 51%, China's e-commerce is growing at 18%, Japan 11% and South Korea 10%' (The Economic Times, 2016).¹

¹The Economic Times (08 May 2016), India's e-commerce sector to see \$120 billion revenue by 2020: ASSOCHAM-Forrester Study report. Retrieved from <https://economictimes.indiatimes.com/industry/services/retail/indias-e-commerce-sector-to-see-120-billion-revenue-by-2020-asso-cham-forrester-report/article-show/52172120.cms> on 17 August 2017

E-commerce Connectivity in ASEAN

The Digital Commerce Report (Kantar-IMRB, 2017) says that the 'Indian e-commerce market has grown at a compound annual growth rate (CAGR) of 34% between December 2011 and December 2017. It was estimated to reach INR 20.44 billion by December 2017. In 2017, 54% of the e-commerce market was covered by travel sector whilst remaining 46% was covering non-travel sectors, such as e-tail (36%), utility services (5%), matrimony and classified (2%) and other online services (3%)'. The main contributors of this growth are India's young demographic profile, increasing Internet penetration and ICT connectivity, availability of digital payment services, and improved economic performance after liberalisation in 1991 (Figure 8.1).

**Figure 8.1: Growth of E-commerce in India,
Value of Digital Commerce in India (INR billion)**



Source: Kantar-IMRB (2017).

ICT connectivity refers to the use of ICT tools to exchange and share information between two or more parties. Indicators of ICT connectivity are the state of national ICT infrastructure; broadband service speed, availability, affordability, and adoption; and technology adoption by firms and government. India has one of the fastest-growing telecommunication subscriber bases in the world. The government has initiated several programmes such as Digital India, Smart Cities, and BharatNet to ensure data connectivity for the masses and to 'connect the unconnected'. The status of selected indicators is given below:

- The Telecom Regulatory Authority of India (TRAI) (2017) says, 'As on 30 September 2017, total telecom subscribers in India were 1206.71 million (out of this 98% are wireless) with a teledensity of 93.40. Total internet subscribers were 429.23 million out of which 98% were wireless subscribers. Total internet subscribers per 100 populations was 33.22 whereas it was 73.65 and 14.62 in urban and rural areas, respectively. The average data usage per month was 1600 MB'.

- The average Internet speed for mobile broadband in India was 2 megabits per second (Mbps) for upload and 6 Mbps for download, which was lower than in most ASEAN countries, except for Myanmar and Viet Nam (Chen, 2017). In the first quarter of 2017, the average Internet speed in India was 6.5 Mbps and it ranked 89th globally (Akamai, 2017).
- Firm-level technology adoption in India has considerably declined from 5.58/7 in 2007–2008 to 4.36/7 in 2016–2017 (WEF, 2016b). ASEAN countries followed an almost similar pattern but the ASEAN average has been higher than India's since 2014–2015.
- India stands at 91st out of 139 countries, with a score of 3.75/7 in the Network Readiness Index² of the World Economic Forum.

Logistics connectivity refers to the physical part of e-commerce and is responsible for the final delivery of products from origin to destination. India has sound logistics infrastructure for roads, rail, and sea transport, but gaps still limit India's connectivity with ASEAN countries. The status of logistics connectivity of India (Indiastat)³ is as follows:

- **Railways.** Total railway routes increased from 64,600 kilometres in 2011–2012 to 66,687 km in 2015–2016 whereas the running track increased from 89,801 km to 92,081 km during the same period. Total freight traffic increased from 975.16 million tonnes to 1,108.62 million tonnes during the same period.
- **Road.** Total road length (all types of road, rural and urban) increased from 4,471,510 km on 31 March 2009 to 5,603,293 km on 31 March 2016. The length of national and state highways increased from 70,548 km and 158,497 km to 101,011 km and 176,166 km, respectively, during the same period. National and state highways play a major role in connecting goods' place of origin to destination, and especially to ports for cross-border delivery.
- **Shipping and ports.** Traffic capacity of major ports⁴ in India is 965.36 million tonnes. Total overseas traffic handled by these ports was 461.87 million tonnes in 2014–2015.
- **International logistics connectivity.** India has international land borders of 15,106.7 km and a sea coastline of 7,516.6 km. The border with Myanmar is 1,643 km, which gives entry to Thailand and other ASEAN members. Almost all major cities are connected to parts of the world by air.

² A measure of how well an economy is using ICT to boost competitiveness and well-being.

³ The source of data is Indiastat.com.

⁴ Including Kolkata, Haldia, Paradip, Visakhapatnam, Kamarajar, Chennai, VOC-Chidambaram, Cochin, New Mangalore, Mormugao, Mumbai, Jawaharlal Nehru Port Trust, and Kandla.

There is only one functional land customs station between India and Myanmar – Moreh and Tamu – which, however, is not well developed. But India, Myanmar, and Thailand are working on a 1,400 km tri-country highway that will connect India through its north-eastern states with Southeast Asia. Major Indian seaports are connected to ASEAN countries. Myanmar's Dawei deep-sea port and industrial estate project near Thailand's border are expected to help further integrate eastern India with Southeast Asian countries. The planned port can be linked with India's Chennai port as well as Thailand's Laem Chabang port on the other side of the ocean.

E-payments have grown increasingly over the last decade due to widely spread Internet-based banking and consumers' evolving purchasing habits. India, a traditionally cash-heavy society, is striving hard to transform itself into a cash-light society. The government is promoting e-payment through various initiatives but challenges, attributable to unfavourable policies and practices, hinder it. Optimal regulation and competition to facilitate access deserves much more consideration than it currently receives. More detailed insights on cross-border e-payment connectivity between India and ASEAN are in section 6.

3. E-payment: National Priority

In the past decade, India has experienced revolutionary growth in telecommunications, specifically in mobile phone and Internet connection. The increasing availability of the Internet has led to growing use of digital payment. The use of ICT, the high penetration of mobile phones and the Internet, and quick adoption of online economic activities, including e-commerce, have created enormous opportunities for e-payment systems.

The Jan Dhan–Aadhar–Mobile (JAM) Trinity has further strengthened uptake. A government initiative, JAM links Jan Dhan bank accounts,⁵ mobile numbers, and Aadhar cards to achieve complete financial inclusion and to reduce or even eliminate leaks in government subsidies. The following are the three most important events related to this initiative:

- i. 'Pradhan Mantri Jan Dhan Yojan', under which over 310 million bank accounts had been opened by 7 February 2018, with deposits totalling US\$12 billion in just 3.5 years after its launch on 28 August 2014.
- ii. Demonetisation of Re500 and Re1,000 notes on 8 November 2016, which led to the withdrawal of almost 85.9% of the currency in circulation: Re15.44 trillion out of

⁵ Pradhan Mantri Jan-Dhan Yojana (PMJDY) is National Mission for Financial Inclusion to ensure access to financial services, namely, banking/ savings & deposit accounts, remittance, credit, insurance, and pension in an affordable manner. Accounts can be opened in any bank branch or business correspondent (Bank Mitra) outlet. Accounts opened under PMJDY are being opened with zero balance. However, if the account-holder wishes to get a cheque book, they will have to fulfil minimum balance criteria.

Re17.977 trillion (Wilson, 2017). Demonetisation has been touted as a 'process to digitalisation', a move to a cashless society, as it left people with only digital means to pay.

- iii. Entry of Reliance Jio into the telecommunication market on 27 December 2015. It has had substantial impact on both price and consumption of Internet services: 'The average monthly data consumed by wireless users increased almost six times from 0.6 GB to 3.5 GB with prices crashed by 97% from Re200/GB to Re6/GB from April–June 2016 to April–June 2017' (Eluvangal, 2017).

The cumulative impact of these events was magnified because of the availability of low-cost smartphones.

E-payment refers to online financial exchanges using digital financial instrument(s). A bank, legal tender, or an intermediary backs these financial instruments. A range of digital financial instruments is available in India (section 3.2). E-payments are vital for e-commerce as they bridge the virtual (online platform) and physical (logistics and transport) parts of online sales and purchase of goods and services. Digital transactions have been growing because of the diffusion of new technologies in the digital payment infrastructure and increasing willingness of consumers to accept cashless transactions.

The Standing Committee on Finance (2017: 65) said:

Digital transactions allow for services to be delivered at a competitive cost, afford greater scalability and enable small and micro enterprises to access formal financial services and benefits of e-commerce. Such a process can create a multiplier effect in efficiency of capital use through greater transparency, traceability of transactions, enforceability of law and significantly buoyed tax revenues for social welfare. Further, in addition to accelerating financial inclusion, opening up new business models and markets, digital payment can be expected to improve the State's ability to curb tax leakages and reduce cash related costs and inconvenience.

While e-payments may have made payments easy and less time consuming, they are also susceptible to risks such as theft of payments and personal data and fraudulent transactions. Transforming India into a cashless economy is contingent upon enabling access of the poorest of the poor to formal financial services. Despite several government initiatives, remaining challenges include digital illiteracy; inadequate Internet connectivity in banking; insufficient banking infrastructure, especially in rural areas; lack of awareness, mostly amongst rural customers; and an unorganised indigenous market.

3.1. Government Initiatives to Promote E-payment

Making India a cashless society is a government priority. The following are some initiatives to realise it:

Establishment of the National Payment Corporation of India (NPCI). The Reserve Bank of India (RBI) and Indian Banks Association established the NPCI as provided by the Payment and Settlement Systems (PSS) Act of 2007. The NPCI aims to provide innovative infrastructure for retail payment and settlement systems using technology. Since its inception in 2008, the NPCI has introduced revolutionary measures to promote e-payment.

People are becoming comfortable day by day in using cards at points of sale (PoS) and other non-cash modes of payment. This is envisaged to promote 'card not present' (CNP) transactions,⁶ which are hindered by consumers' lack of trust of digital platforms.

Pradhan Mantri Jan Dhan Yojan (PMJDY) was launched so all Indian citizens could have a bank account. Recently cited in the Guinness World Records, the scheme saw over 310 million bank accounts opened, with total deposits of US\$12 billion in just 3.5 years. The account holders are issued a RuPay debit card and have access to Internet banking. PMJDY accounts are used to electronically channel government benefits (gas subsidy, payments of government employment programmes, crop insurance, among others) without intermediaries, reducing transaction costs and bureaucracy and drawing the common people into the formal financial system.

Digital India Programme is a government umbrella curriculum involving multiple ministries and departments, and including several schemes and projects to transform India into a digitally empowered society and knowledge economy by promoting digitalisation of services, including e-payment (Box 1).

⁶ A CNP transaction is one where the cardholder does not or cannot physically present the card for a merchant's visual examination at the time an order is given and payment effected.

**Box 1: Major Initiatives Taken Under the Digital India
Programme to Promote E-payment**

Discounts and cashback on digital payment

- Public sector petroleum companies give a 0.75% discount on digital payments of diesel and petrol.
- The government directed all central public sector undertakings and central government departments to ensure that merchant discount rate (MDR) charges* or transactions are borne by them, not by consumers, if payment is made digitally.
- Several discounts have been announced for e-payment on booking gas cylinders, paying at toll plazas, and so on. Most central government departments and ministries have also floated several offers on e-payment for their services. For example, Indian Railways incentivised monthly and seasonal ticket bookings by 0.5% and its catering and accommodation services by 5% if payment is made electronically.
- Public sector insurance companies will incentivise general insurance policies and new life policies of the Life Insurance Corporation by way of discount or credit up to 10% and 8%, respectively, if paid for digitally through the online customer portal.
- Merchants offering Aadhaar-based biometric merchant transactions are incentivised by a discount of 0.5% (within the range of Re1 to Re10) of transactions valued up to Re2,000.
- Through the Bharat Interface for Money (BHIM), merchants can earn up to Re1,000 per month as a cashback on a minimum of 50 transactions (at least 20 with unique customers) with a minimum value of Re25.
- Through the BHIM referral bonus scheme, individuals can offer a referral bonus to three unique users upon completing at least three unique successful transactions with an aggregate value of Re50. Both referrer and referee get Re25 each.

Developing digital payment infrastructure

- To develop rural digital payment infrastructure, the government deployed two PoS machines per 100,000 villages with populations of less than 10,000. The government also financially supports cooperative banks and rural regional banks in issuing Rupay Kisan cards to over 43 million Kisan credit card holders to allow them to transact electronically at PoS and ATMs.

Withdrawal of fees and charges

- To bring small merchants to the digital payment platform, public sector banks have been advised to cap monthly rentals of mobile PoS, PoS machines, and micro ATMs to Re100 per month.
- Service tax has been withdrawn on digital transactions of up to Re2,000.

Awareness and training programmes

- Several digital financial inclusion awareness and access programmes (Digital Jagriti) are being organised for consumers and merchants. Similar training programmes have been organised for government officials, and government ministries and departments have been given digital transaction targets.
- DigiShala, the free Doordarshan DTH channel, uses Hindi, English, and regional languages to promote e-payment. To encourage citizens to use e-payment, the government launched Lucky Grahak Yojna (LGY) and DigiDhan Vyapar Yojana (DDVY). Under LGY, a daily reward of Re1,000 was announced for 15,000 lucky consumers for 100 days, along with weekly prizes worth Re100,000, Re10,000, and Re5,000 for consumers who used modes of e-payment, except private credit cards and digital wallets. Under DDVY, merchants using e-transactions were offered weekly prizes worth Re50,000, Re5,000, and Re2,500. Three mega prizes for consumers (Re10 million, Re5 million, and Re2.5 million) and merchants (Re5 million, Re2.5 million, and Re1.2 million) were offered for adopting e-payment from 8 November 2016 to 13 April 2017.

* MDR is charged on payments made to merchants through the Bharat Interface for Money Unified Payments Interface (BHIM UPI) platform and the Aadhaar Enabled Payment System (AePS). When payment is made at a merchant point of sale, MDR is payable by the trader to the bank.

Source: The Standing Committee on Finance (2017).

3.2. E-payment Systems and Instruments

Numerous modes of e-payment are available:

Aadhaar Enabled Payment System (AePS) was developed by the NPCI, based on unique identification numbers. It allows a person holding an Aadhaar number to carry out a financial transaction on a micro ATM provided by the banking correspondent. AePS empowers the marginalised and excluded to transact financially in their villages.

Credit and debit cards are the most popular digital finance instruments. They free people from the burden of carrying huge amounts of cash and reduce the risk of theft. They can be used to pay at PoS through swipe machines. Credit card payments are settled after 50 days.

Mobile banking has become the most popular instrument for transferring funds, monitoring account balances, paying bills, and so on, using smartphones or other cellular devices.

Unified Payment Interface (UPI) is a single-window mobile payment system launched by the NPCI. The system is designed to send and receive money through smartphones. It works through a 'single identifier', which can be a virtual address such as a mobile number, an Aadhaar number, or an email ID. It does not require entering sensitive banks details.

National Electronic Fund Transfer (NEFT), started in 2005, 'operates on a Deferred Net Settlement (DNS) basis which settles transactions between two banks/their branches. In DNS, the settlement takes place with all transactions received until the particular cut-off time. These transactions are netted (payable and receivables) in NEFT whereas in RTGS [real time gross settlement] the transactions are settled individually'.⁷

Prepaid payment instruments (PPIs) facilitate the purchase of goods and services against the value stored in such instruments, which represents the value paid for by the holder by cash, debit to a bank account, or credit card. Popular PPIs are magnetic-strip cards, smart cards, Internet wallets, Internet accounts, mobile accounts, paper vouchers, mobile wallets, and any such instruments, which can be used to access the prepaid amount.

Wallets are also known as mobile wallets, digital wallets, or e-wallets. A virtual wallet stores payment card information on a mobile device. This is a type of e-commerce model designated to be used with smartphones for paying online. The popular wallets in India are Paytm, Freecharge, Mobikwik, Oxigen, mRuppee, Airtel Money, Jio Money, SBI Buddy, Izt Cash, Citrus Pay, Vodafone M-Pesa, Axis Bank Lime, ICICI Pockets, SpeedPay, amongst others.

Real-time gross settlement (RTGS) is 'the continuous (real-time) settlement of funds transfers individually on an order by order basis (without netting). "Real Time" means the processing of instructions at the time they are received rather than at some later time; "Gross Settlement" means the settlement of funds transfer instructions occurs individually (on an instruction by instruction basis). Considering that the funds settlement takes place in the books of the RBI, the payments are final and irrevocable. RTGSs are used for high-value transactions of at least Re0.2 million'.⁸

Immediate payment service (IMPS) is an instant and real-time inter-bank and/or intra-bank electronic fund transfer system. It works through a mobile phone, ATM, and Internet banking, and so on. Unlike RTGS and NEFT, IMPS works 24/7, including bank holidays.

Unstructured supplementary service data (USSD) is a national unified platform for mobile banking, which transmits information through Global System for Mobile (GSM) communication network channels. It transfers funds via MMID (a code allotted by banks for mobile banking registration), Aadhaar number, or IFSC code, and checks account balances and generates mini statements.

⁷ FAQ issued by the Reserve Bank of India for RTGS. http://www.dif.mp.gov.in/circulars/RBI_FAQ_RTGS_NEFT.pdf on 19 February 2018.

⁸ Ibid.

The AePS and immediate payment service are used only for domestic transactions, while credit and debit cards, mobile banking, real-time gross settlement, and national electronic fund transfer are used for domestic as well as international transactions.

3.3. Regulatory Framework for E-payment

The responsibility of regulating the banking sector, including settlements and payments, lies with the central bank, the RBI. The PSS Act defines a 'payment system' as 'a system that enables payment to be effected between a payer and a beneficiary, involving clearing, payment or settlement service or all of them, but does not include a stock exchange' (Section 2[1]).

Two regulations under this act provide the RBI with statutory powers: the Board for Regulation and Supervision of Payment and Settlement Systems, 2008 and the Payment and Settlement Systems Regulations, 2008. The former empowers the RBI to prescribe policies and set standards for regulating payment and settlement systems, while the latter provides the procedural requirements for commencing payment systems.

To promote e-payment to purchase goods and services and to pay bills, the RBI issued 'directions for opening and operation of accounts and settlement of payments for e-payment transactions involving intermediaries' on 24 November 2009 (Reserve Bank of India, 2009). The notification contains all the guidelines to safeguard the interests of customers paying online and defines intermediaries, merchants, and accounts for collecting payment. It lays more responsibilities on banks for timely settlement of payment to merchants by intermediaries after receiving money from customers, and for the audit of these accounts.

Further, to regulate payment and settlement of PPIs, the RBI issued a master circular in 2014, which contains policy guidelines on the issuance and operation of PPIs (Reserve Bank of India, 2014). The notification allows the issuance of PPIs under three categories:

Closed System Payment Instruments which are issued by a person for facilitating buying goods and services from him. Cash withdrawal/redemption and payment & settlement for third party services are not permitted under these instruments. Semi-closed System Payment Instruments which can be used for purchase of goods and services, including financial services at a group of clearly identified merchant locations/ establishments which have a specific contract with the issuer to accept the payment instruments. These instruments also do not permit cash withdrawal or redemption by the holder. And Open System Payment Instruments; which can be used for purchase of goods and services, including financial services like funds transfer at any card accepting merchant locations (point of sale terminals) and also permit cash withdrawal at ATMs and BCs (automated teller machine / banking correspondents) (Reserve Bank of India, 2014).

This notification also defines the limits on and eligibility for issuing a PPI, provides safeguards against money laundering, validity of PPIs, sets transaction limits, provides fraud prevention and security standards, and protects customers.

To redress customers' grievances, the RBI launched the Banking Ombudsman Scheme, 2006, updated on 14 July 2017. It outlines the entire procedure for filing a complaint about banking services and for resolving it (Reserve Bank of India, 2017).

4. E-payment and E-commerce: Convergence

While a variety of e-payment options are available, few are applicable to the business-to-consumer (B2C) mode of e-commerce, such as online payment through credit or debit cards (CNP transactions), Internet banking, and PPI. However, the dominant mode of online payment is cash on delivery. Its popularity may be attributed to consumers' preference to receive the product before paying, and may be associated with consumers' lack of trust in online merchants and transactions.

The trend, however, seems to be changing. Amazon India, a leading e-tailer, says that digital payments accounted for over 60% of total transactions recorded in its portal in 2017, compared with less than 50% in 2016 (Variyar, 2018). For prepaid e-commerce orders, consumers prefer CNP transactions, wallets, and Internet banking. Most CNP transactions occur in private payment gateways. This is visible on the website of the Indian Railway Catering and Tourism Corporation (IRCTC) (www.irctc.co.in) (Figure 8.2), the subsidiary of Indian Railways handling catering tourism and online ticketing. IRCTC is also the biggest e-commerce player in India.

The payment page shows various modes of e-payment such as Internet banking, BHIM, UPI, USSD, credit and debit cards, wallets, cash cards, and pay on delivery (Figure 8.3). All payment gateways are owned by private banks and provide an interface between merchant and consumer. Because the platforms are private, transaction data is not publicly available, which limits the scope of this study to gauge the growth of e-commerce in recent years.

Figure 8.2: E-payment Gateways available on IRCTC

• User can have a maximum of 5 Banks in their Preference list. User can manage their Bank Preferences under *My Profile* section.

• All VISA/MASTER Debit cards (If enabled by card issuer) can also be used for ticket booking through any of the payment options listed under 'Multiple Payment Service' or 'Payment Gateway / Credit / Debit Cards' payment category.

• All RuPay Debit Cards (If enabled by card issuer) can also be used for ticket booking through 'RuPay-Card KOTAK PG'.

• All international Debit/Credit cards can also be used for ticket booking through 'International Cards (Powered by ATOM)'.

Preferred Banks	<input type="radio"/> Visa/Master Card(Powered By CITI BANK)	<input type="radio"/> Visa/Master Card(Powered By HDFC BANK)
BHIM / UPI / USSD	<input type="radio"/> American Express	<input type="radio"/> Visa/Master Card(Powered By AXIS BANK)
Multiple Payment Service (Credit & Debit Cards/ Netbanking /Wallets / International Cards)	<input type="radio"/> RuPay Card (Powered by Kotak Bank)	
Debit Card with PIN	Add as Preferred Bank <input type="checkbox"/> In case of cancellation, the refund will be applicable as per New Railway Refund Rules. Please visit "Refund Rule"section at IRCTC home page.	
Net Banking		
Bharat QR / Scan & Pay		
Wallets/ Cash Cards		
IRCTC Prepaid		
IRCTC eWallet		
Pay On Delivery / Paylater		
Payment Gateway /Credit /Debit Cards		

IRCTC = Indian Railway Catering and Tourism Corporation.
Source: www.irctc.co.in

Figure 8.3: E-payment Wallet Options available on IRCTC

• User can have a maximum of 5 Banks in their Preference list. User can manage their Bank Preferences under *My Profile* section.

Preferred Banks	<input type="radio"/> I Cash Card	<input type="radio"/> Oxigen Wallet	<input type="radio"/> Mobikwik Wallet (Offers)
BHIM / UPI / USSD	<input type="radio"/> Paytm Wallet (Offers)	<input type="radio"/> Freecharge Wallet (Offers)	<input type="radio"/> SBI Buddy
Multiple Payment Service (Credit & Debit Cards/ Netbanking /Wallets / International Cards)	<input type="radio"/> OLAMONEY Wallet	<input type="radio"/> Airtel Money	
Debit Card with PIN	Add as Preferred Bank <input type="checkbox"/> In case of cancellation, the refund will be applicable as per New Railway Refund Rules. Please visit "Refund Rule"section at IRCTC home page.		
Net Banking			
Bharat QR / Scan & Pay			
Wallets/ Cash Cards			
IRCTC Prepaid			
IRCTC eWallet			
Pay On Delivery / Paylater			
Payment Gateway /Credit /Debit Cards			

IRCTC = Indian Railway Catering and Tourism Corporation.
Source: www.irctc.co.in

Most wallet services are also provided by private players. Indian Railways offers its own wallet service, easing transactions on its website. But the wallet is closed, which prevents it from being used on other websites or platforms. Wallets and cash cards are PPIs. A number of PPIs have emerged in the last 5 years and gained immense popularity, such as PayTM, which is the largest wallet service in India, and Sodexo, the meal vouchers. The growth of e-payment through wallets and PPIs is highlighted in Table 8.3. The types of PPIs are listed in Box 2.

Box 2: Types of Prepaid Payment Instruments

Closed-system payment instruments. Generally issued by business establishments for use at their establishment only, these instruments do not permit cash withdrawal or redemption. For example, Freecharge credit, Ola money.

Semi-closed system payment instruments. Redeemable at a group of merchants and establishments that have contracted with the issuer to accept them, these instruments do not permit cash withdrawal or redemption. For example, Paytm.

Semi-open system payment instruments. Used at any merchant location that accepts them, these instruments do not permit cash withdrawal or redemption. For example, private-label cards issued by merchants.

Open-system payment instruments. Used to purchase goods and services, these instruments can also be used to withdraw cash at ATMs. For example, almost every Visa, MasterCard, or Rupay card issued in India.

Mobile prepaid instruments. The prepaid talk time issued by mobile service providers can also be used to purchase 'value-added service' from the provider or a third party.

Source: Reserve Bank of India (2014).

A few private entities (non-banks) provide digital payment solutions by acting as gateways for all modes of e-payment instruments such as credit and debit cards, Internet banking, and wallets (Figure 8.4). Data on these gateways is not publicly available.

E-payment options such as NEFT, RTGS, and IMPS are associated more with business-to-business (B2B) e-commerce and peer-to-peer (P2P) payments because they can be used to pay large amounts.

Due to the paucity of publicly available data on CNP transactions in various gateways, this study correlates the rise in e-payments with the growth of e-commerce. Aggregate e-payment data was used as a proxy variable for e-commerce payment data. This section presents the facts about volume and value of e-payment for major modes.

Figure 8.4: Credit and Debit Card E-payment Options available on IRCTC

• User can have a maximum of 5 Banks in their Preference list. User can manage their Bank Preferences under *My Profile* section.

Preferred Banks	<input type="radio"/> Credit & Debit cards / Net Banking / Wallet (Powered by Paytm)
BHIM / UPI / USSD	<input type="radio"/> International cards (Powered by ATOM)
Multiple Payment Service (Credit & Debit Cards/ Netbanking/ Wallets / International Cards)	<input type="radio"/> Credit & Debit cards / Net Banking / Wallet (Powered by ITZ)
Debit Card with PIN	<input type="radio"/> Credit & Debit cards / Net Banking / Wallet (Powered by PayU)
Net Banking	<input type="radio"/> Credit & Debit cards / Net Banking / UPI (Powered by Razorpay)
Bharat QR / Scan & Pay	Add as Preferred Bank <input type="checkbox"/>
Wallets/ Cash Cards	In case of cancellation, the refund will be applicable as per New Railway Refund Rules. Please visit "Refund Rule" section at IRCTC home page.
IRCTC Prepaid	
IRCTC eWallet	
Pay On Delivery / Paylater	
Payment Gateway /Credit /Debit Cards	

IRCTC = Indian Railway Catering and Tourism Corporation.
Source: www.irctc.co.in

Table 8.1 exhibits the trends in e-payment from 2013–2014 to 2016–2017. The volume and value of total digital transactions increased from Re2,697.15 million and Re996,330.8 billion in 2013–2014 to Re10,855.91 million and Re1,467,175.11 billion in 2016–2017, respectively. Over this period, the volume of e-payments grew by over 300% while their value increased by 47.26%. It is important to note that the increase from 2015–2016 to 2016–2017 happened after demonetisation. The volume and value of e-payments in 2016–2017 (year-on-year) increased by 63.45% and 22.41%, respectively.

Table 8.1: Trends in Volume and Value of Selected E-payment Systems, 2013–2014 to 2016–2017

Year ^a	RTGS	NEFT	IMPS	Debit and Credit Cards ^b	PPI ^c	Total ^d
Volume (million)						
2013–2014	81.11	661.01	15.36	1,128.16	133.63	2,697.15
2014–2015	92.78	927.55	78.37	1,423.21	314.46	4,141.4
2015–2016	98.34	1,252.88	220.81	1,959.28	748.02	6,641.8
2016–2017	107.86	1,622.10	506.73	3,486.43	1,963.66	10,855.91
Value (Re billion)						
2013–2014	904,968.04	43,785.52	95.81	2,494.36	80.87	996,330.8
2014–2015	929,332.89	59,803.83	581.87	3,112.65	213.42	1,061,035.47
2015–2016	1,035,551.64	83,273.11	1,622.26	3,995.89	487.58	1,198,621.46
2016–2017	1,253,652.08	120,039.68	4,111.06	6,582.89	838.01	1,467,175.11

RTGS = real time gross settlement, NEFT = national electronic fund transfer, IMPS = immediate payment service, PPI = prepaid payment instrument.
Source: National Payments Corporation of India (various years); RBI Bulletin, Reserve Bank of India (various years).

^a Financial year from April to March.

^b Card transactions of four banks only, including PoS, not ATM withdrawals.

^c PPI issued by eight issuers for goods and service transactions only.

^d Total figures include other modes such as cheque truncation system and national automated clearing house.

Table 8.2 presents trends in volume and value of e-payments for major modes after demonetisation. The total volume of e-payments increased from Re671.5 million in November 2016 to Re1,064.2 million in December 2017, with a semi-log trend growth rate (SLTGR) of 1.83% and a compound average (monthly) growth rate (CAGR) of 4.30%. At the same time, total value of e-payments increased from Re94,004.2 billion in November 2016 to Re125,531.5 billion in December 2017 with an SLTGR of 1.63% and a CAGR of 3.82%. However, the highest growth has been registered by the UPI (SLTGR of 37.49% in volume and 25.92% in value of e-payments), signifying that people preferred to pay using smartphones. This is followed by the use of IMPS and PPI. These trends undoubtedly reflect that payments using smartphone have captured the e-payment markets and ICT has changed the way people pay for their purchases. Table 8.2 also shows that credit and debit cards have not been as widely adopted, which may be because the cards and swipe machines are not as available.

Table 8.2: Trends in Volume and Value of Selected E-Payment Systems after Demonetisation in November 2016

Year ^a	RTGS	NEFT	IMPS	UPI	Debit and Credit Cards ^b	PPI ^c	Total ^d
Volume (million)							
Nov-2016	7.9	123.0	36.2	0.3	205.5	59.0	671.5
Dec-2016	8.8	166.3	52.8	2.0	311.0	87.8	957.5
Jan-2017	9.3	164.2	62.4	4.2	265.5	87.3	870.4
Feb-2017	9.1	148.2	59.7	4.2	212.3	78.4	763.0
Mar-2017	12.5	186.7	67.4	6.2	229.7	90.0	893.9
Apr-2017	9.5	143.2	65.1	6.9	231.1	89.2	853.1
May-2017	10.4	155.8	66.7	9.2	233.4	91.3	858.5
Jun-2017	9.8	152.3	65.8	10.2	232.4	84.7	844.7
Jul-2017	9.4	148.1	69.1	11.4	237.6	88.7	861.1
Aug-2017	9.5	151.6	75.7	16.6	243.0	89.7	883.4
Sep-2017	9.6	157.7	82.9	30.8	240.3	87.5	877.0
Oct-2017	10.0	158.8	88.1	76.8	255.7	96.2	967.3
Nov-2017	10.8	162.0	89.5	104.8	244.6	92.8	998.5
Dec-2017	10.9	169.0	98.0	145.5	263.9	99.1	1,064.2
SLTGR (%)	1.32	0.66	5.47	37.49	0.33	1.95	1.83
CAGR (%)	3.09	1.53	13.42	137.08	0.76	4.59	4.30
Volume (million)							
Nov-2016	78,479.2	8,807.8	324.8	0.9	352.4	13.2	94,004.2
Dec-2016	84,096.5	11,537.6	431.9	7.0	522.2	21.3	104,055.3

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Year ^a	RTGS	NEFT	IMPS	UPI	Debit and Credit Cards ^b	PPI ^c	Total ^d
Jan-2017	77,486.1	11,355.1	491.2	16.6	481.2	21.0	97,011.4
Feb-2017	74,218.8	10,877.9	482.2	19.0	391.5	18.7	92,594.5
Mar-2017	123,375.8	16,294.5	564.7	23.9	416.2	21.5	149,589.1
Apr-2017	88,512.2	12,156.2	562.1	22.0	431.4	22.3	109,602.2
May-2017	90,170.5	12,410.8	585.6	27.7	450.8	25.3	111,109.3
Jun-2017	92,812.6	12,694.2	596.5	30.7	468.2	24.1	113,745.2
Jul-2017	87,149.3	12,011.6	604.8	33.8	439.3	25.1	107,378.4
Aug-2017	89,163.4	12,500.4	651.5	41.3	457.1	27.2	109,817.9
Sep-2017	102,348.1	14,182.1	717.6	52.9	478.2	27.6	124,706.8
Oct-2017	92,056.1	13,851.3	750.4	70.3	530.5	32.7	114,532.2
Nov-2017	98,410.5	13,884.0	782.6	96.4	483.3	32.0	121,047.1
Dec-2017	100,907.8	15,779.2	871.1	131.4	528.7	35.1	125,531.5

RTGS = real time gross settlement, NEFT = national electronic fund transfer, IMPS = immediate payment service, PPI = prepaid payment instrument, SLTGR = semi-log trend growth rate, CAGR = compound annual growth rate.

Source: National Payments Corporation of India (various years); RBI Bulletin, Reserve Bank of India (various years).

^a Financial year from April to March.

^b Card transactions of four banks only, including PoS, not ATM withdrawals.

^c PPI issued by eight issuers for goods and service transactions only.

^d Total figures include other modes such as cheque truncation system and national automated clearing house.

Note: SLTGR has been calculated by fitting semi-log function as $\ln Y = ab^t e^{\alpha}$ Or $\ln Y = a + bt$. Here, $b = 1 + r$ and r is CAGR, Y = variable indicating the volume and value of e-payments for respective instruments, b = slope coefficient which measures the relative change in Y for a given absolute change in value of explanatory variable t which is time. The multiplication of b by 100, gives semi-log trend rate of growth in Y for an absolute change in t . CAGR has been computed using the formula $r = e^b - 1$, further elaborated as $CAGR (r\%) = (AL(\log b) - 1) \times 100$

Table 8.3 depicts the phenomenal increase in both volume and value of e-payments through wallets and mobile banking from 2013–2014 to 2016–2017, especially from 2015–2016 to 2016–2017, i.e., after demonetisation. The volume of e-payments through wallets and mobile banking increased from Re603.98 million and Re389.48 million in 2015–2016 to Re1,629.98 million and Re976.85 million in 2016–2017, respectively. The value of e-payments through wallets and mobile banking increased from Re205.84 billion and Re4,040.91 billion in 2015–2016 to Re532.42 billion and Re13,104.76 billion in 2016–2017, respectively. As far as the use of wallets and mobile banking is concerned after demonetisation, the volume of e-payments increased at an SLTGR of 2.35% and 4.97% monthly, respectively, whilst the value of e-payments increased at a SLTGR of 4.58% and negative 2.70% monthly, respectively.

Table 8.3: Trends in Volume and Value of Payments through Wallets and Mobile Banking, from 2013–2014 to 2016–2017

Year ^a	Wallets		Mobile Banking ^b	
	Volume (million)	Value (Re billion)	Volume (million)	Value (Re billion)
2013-14	107.51	29.05	94.71	224.18
2014-15	255.00	81.84	171.92	1,035.30
2015-16	603.98	205.84	389.49	4,040.91
2016-17	1,629.98	532.42	976.85	13,104.76
Nov-2016	99.57	33.05	72.3	1,244.9
Dec-2016	138.09	74.48	70.2	1,365.9
Jan-2017	261.67	83.53	64.9	1,206.7
Feb-2017	246.95	69.11	56.2	1,080.0
Mar-2017	307.45	73.12	60.8	1,499.9
Apr-2017	320.87	74.42	61.0	1,443.8
May-2017	241.72	71.94	64.9	1,940.7
Jun-2017	221.63	53.10	77.1	1,584.7
Jul-2017	235.46	69.34	69.5	1,019.2
Aug-2017	225.43	72.62	70.8	1,033.0
Sep-2017	199.48	81.54	86.3	1,121.6
Oct-2017	201.23	86.60	130.9	1,168.7
Nov-2017	186.67	93.88	122.8	848.4
Dec-2017	288.37	125.68	113.3	921.5
SLTGR^c (%)	2.35	4.58	4.97	-2.70
CAGR^c (%)	5.56	11.12	12.12	--

SLTGR = semi-log trend growth rate, CAGR = compound annual growth rate.

Source: National Payments Corporation of India (various years); Reserve Bank of India (various years).

^a Financial year from April to March.

^b Mobile banking figures are for five banks only.

^c SLTGR and CAGR were calculated from November 2016 to December 2017.

The interesting fact is that the use of wallets and mobile banking increased at an unprecedented rate for the initial 6 months after demonetisation and later declined considerably. It means that the return of cash after demonetisation slowed the pace of adopting digital payment. The growth of the use of wallets may be attributed to various offers and discounts provided by various companies.

5. E-payment and E-commerce: Challenges

Demonetisation massively boosted digital payment initially, but its effects wore off when ample cash was back in circulation. E-payment greatly enables e-commerce but challenges have kept its impact at bay:

Cross-border transactions. These are inefficient as payment systems across the globe are not uniform. Most are bound by laws and regulations in their jurisdictions and by domestic banking and financial structures (Park, 2006). Rules and fees also vary from country to country, which discourages cross-border online purchases.

Cybersecurity issues. A major challenge to e-payment is cybersecurity breaches, which encompass stealing of consumer and payment information (data phishing), fraudulent financial transactions through unauthorised account access (hacking), cyberbullying, ransomware attacks, amongst others. As in the rest of the world, cybersecurity concerns are on the rise in India. Numerous countries, including India, were recently subjected to ransomware attacks such as Wannacry and Petya. This may be attributed to consumers' limited understanding of the need to update operating systems, use licensed software, adopt precautionary measures when using the Internet, and know how to report such cases.

Financial information leaks from commercial banks, as well as leaks of unique identification numbers (Aadhaar), have done little to foster consumers' trust in e-payment. While e-payment should be promoted, consumers should also be able to feel that their finances are secure on Internet platforms.

Multi-currency and payment methods. The key objective of an efficacious e-commerce network is to accept a variety of payment methods and currencies across the globe. Various digital modes such as wallets, mobile payments, and credit and debit cards support online merchants participating in international markets by permitting their customers to pay in their domestic currencies (UNCTAD, 2016). However, for merchants, multi-currency cross-border transactions might require new bank accounts and new business entities, which may lead to new regulatory hurdles in their national markets (DPO, 2017).

Limited banking penetration. Only 40% of adults have a bank account and only 13% of them have a debit card. In March 2017, there were only 50,860 rural bank branches serving over 65% of the total population. Inadequate banking infrastructure hampers the promotion of digital payment.

Unorganised structure of the economy. The market is dominated by the unorganised sector, where more than 50% of the population is engaged in agriculture and its allied activities. The unorganised sector prefers cash payment.

Grievance redressal mechanisms. Even with the PSS Act in place, India lacks a strong grievance redressal mechanism and it is difficult for consumers or micro and small merchants (MSMs) to approach appellate bodies with their grievances.

Fees on e-payment instruments. Banking and other financial companies offering e-payment instruments levy charges and fees. For example, payments through credit cards are charged differently because merchants and consumers use them in different ways. Debit cards are amongst the most common e-payment modes, with various banks charging different amounts each time a debit card swipe is declined. This poses a big challenge to making India a cashless economy.

Challenges for micro and small merchants. In developing countries like India, most people prefer cash to e-payment for daily transactions. Around 78% transactions in India are made in cash. MSMs face many challenges to adopting digital payment:

- MSMs mainly deal with rural people who still have not adopted cashless payment due to low income, lack of digital literacy, and poverty.
- A small retail shop selling at a low margin needs cash daily to pay wholesalers and therefore prefers hard cash to digital payment.
- E-payment is a two-sided exchange where the consumer and merchant are willing to use digital payment rather than cash. Because of customers' inefficient aggregate demand for e-payment, especially in developing countries like India, digital payment is not successful among MSMs (WEF, 2016).
- Especially in semi-rural and rural areas, insufficient access to the Internet and electricity discourages MSMs from adopting e-payment.
- MSMEs under-report their sales volume to reduce tax liability, which discourages them from adopting e-payment.

Miscellaneous challenges. Other challenges are poor penetration of plastic money, lack of digital literacy, lack of trust between buyers and sellers, and collection of customs duties on cross-border e-commerce.

5.1. SLOT Analysis of E-payment

The following is a SLOT (strengths, limitations, opportunities, and threats) analysis of e-payment.

Strengths:

- A large number of young people adopt technology to conduct business and day-to-day economic activities.
- Millions use smartphones.
- Internet services are available at a very low price.

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- Various e-payment options are available.
- Promoting e-payment and a cashless society is a high priority of the government, which is launching many programmes and schemes to achieve it.
- The e-commerce market is flourishing.
- Payment methods are easy, smooth, and time saving.
- Electronic records of all payments can be recalled at any time.
- E-payment promotes fairness and transparency.
- Payment is done in real time.

Limitations:

- Penetration of banking and telecommunication services is poor in rural areas.
- People lack e-literacy, especially in rural and semi-urban areas.
- Infrastructure is lacking, especially swipe machines at PoS terminals.

Opportunities:

- All banks and several non-banking financial companies are promoting e-payment with attractive offers, including discounts and cashback.
- E-payment can be done anywhere, any time.
- New technologies are available, making payment easier and safer.
- E-payment can curb black money and unrecorded transactions.
- E-payment can curb tax evasion and tax avoidance.
- The government can save on printing currency and its transportation.

Threats:

- Data and money in wallets can be stolen.
- Cybercrime, data encryption, viruses, and malware can harm e-payment software.
- Credit cards, especially, can be charged fraudulently.

6. India–ASEAN Digital Payment Connectivity

Relations between India and ASEAN have come a long way since the Southeast Asian Sectoral Dialogue Partner Meeting in 1992. With full dialogue partnership established in 1995, India's engagement with ASEAN is both regional and sub-regional, with economic cooperation agreements with several Asia-Pacific Economic Cooperation members. India has bilateral agreements with Thailand, Singapore, and Malaysia, and is a signatory to the ASEAN–India Free Trade Agreement, the ASEAN–India Investment and Services Agreement, and, soon, the Regional Comprehensive Economic Partnership.

India and ASEAN are discussing strategic partnerships pertaining to the digital economy. The ASEAN–India Connectivity Summit, held in New Delhi in November 2017, concluded with an emphasis on improving digital and physical links between India and ASEAN countries

to maximise the benefits of cross-border production chains. Similarly, improving digital connectivity was discussed at the ASEAN–India Senior Official Meeting in Hanoi in April 2018, where digital literacy and technology and telecommunication exchange scholarships were discussed.

‘Wider ICT development’ is an ASEAN priority. The ASEAN Digital Integration Framework, embraced during the 32nd ASEAN Summit in April 2018, is aligned with the ASEAN ICT Masterplan 2020 and the Masterplan on ASEAN Connectivity 2025. The five key expected outcomes of the ASEAN ICT Masterplan 2020 (ASEAN Secretariat, 2015b) are (1) an accessible, inclusive, and affordable digital economy; (2) deployment of next-generation ICT as enablers of growth; (3) sustainable development through smart-city technologies; (4) multiple ICT opportunities across a single regional market; and (5) secure digital marketplaces and safe online communities.

With the rise of global digital trade and e-commerce, cross-border trading is evolving and will shape India–ASEAN trade. ASEAN accounts for 10% of India’s global trade, rising from 7% in 2001, making it India’s fourth-largest trading partner. ‘The quantum of trade was gauged at US\$70 billion in 2016–2017, which rose from US\$65 billion in 2015–2016. India’s exports to ASEAN also increased to US\$30 billion in 2016–2017 from US\$25 billion in 2015–2016’, (Ministry of External Affairs, Government of India, 2018).

India is ASEAN’s seventh-largest trading partner, accounting for 2.7% of ASEAN’s total trade in 2013, rising from 1.3% in 2001 (ASSOCHAM, 2016). A conducive environment for trade to flourish must be created.

Because it is disruptive and raises competition concerns, the digital economy is grappling with regulations. The policy framework must evolve to tackle them. Due to the lack of global standards, different procedures and practices exist across sectors, countries, and regions, impacting cooperation between countries and regions, including India and ASEAN. Some ASEAN countries are strengthening their digital economies and rules must be harmonised.

Digital payment is growing at an unprecedented rate across India and ASEAN but, at least for now, they remain cash-heavy. Digital payment systems differ across countries, hampering digital trade. Cross-border e-commerce requires an interoperable payment mechanism.

Thailand rolled out the first phase of an e-payment gateway called PromptPay in 2017 to facilitate its extensive exports with Cambodia, Viet Nam, Lao PDR, and Myanmar. Alipay, valued at US\$60 billion, is the biggest payment gateway in China, about three times bigger than PayPal, the United States’ largest payment gateway. India, too, is working to make its payment system interoperable with other countries.

Considering the varying levels of technical and economic sophistication of ASEAN countries, however, the challenge of achieving financial inclusion and integration and interoperability of payment mechanisms is even bigger. The ASEAN Economic Community's 2025 Blueprint for financial integration highlights the need for real-time payment capabilities to propel socioeconomic growth.

7. Conclusion and Policy Recommendations

E-commerce has transformed how goods and services are purchased, delivered, and consumed domestically and internationally, creating a large number of value chains across the globe and changing customers' buying behaviour and producers' selling techniques. It has also created a new arena of cross-border exchange of goods and services and is therefore important in negotiating bilateral, regional, and multilateral trade agreements, although some countries, including India, still do not agree to them.

The phenomenal growth of e-commerce in India and all over the world can be attributed to connectivity, which brings buyers and sellers together without the need for face-to-face interaction. India has progressed well in ICT and logistics connectivity by establishing new, and expanding existing, infrastructure, but Internet speed, quality of roads, penetration of telecommunication services, especially in rural areas, require attention.

India has done remarkably well in promoting e-payment. In the last decade, the government has launched a number of e-payment methods and instruments, further escalated by demonetisation. The government established the NPCI, which introduced several payment instruments, and the PMJDY, which connected millions of people to banking services and offered several discounts and cashback schemes. The entry of Reliance Jio has unquestionably been pivotal in promoting e-payment because it provides low-cost 4G Internet services to thousands who have never used the Internet, boosting the adoption of wallets and mobile banking.

Still, e-payment penetration is low, especially in rural areas and among small merchants, and is hampered by poor banking penetration in rural areas, cybersecurity and data privacy issues, charges on the use of plastic money, digital illiteracy, and so on.

Closer integration and interoperability are needed as well as better digital security as transactions increase between India and ASEAN. Fraud and consumer grievances will impede the growth of e-commerce and lead to lack of trust amongst consumers. Financial institutions should ensure that consumer data and payments are protected.

7.1 Policy Recommendations

The government set up the Standing Committee on Finance in 2017 to review India's transformation into a digital economy. In January 2018, the committee reported that although the cash-to-GDP ratio declined from 12.2% at the end of March 2016 to 8.8% at the end of March 2017, it still ranks low in terms of e-payments per million people. The committee recommended ways to promote e-payment and make India a cashless society:

- India ranks second to last in the Asia-Pacific region in average Internet speed. About 175 million urban and 750 million rural people are still not connected to telecommunication or Internet services. ICT connectivity speed and geographical coverage should be improved. Manufacturing of telecommunication devices should be encouraged. The Telecom Regulatory Authority of India (TRAI) should ensure that rural and hilly areas have high-speed Internet and telecommunication connectivity. The country should become competitive in broadband expansion and development, focusing on speed and penetration in all parts of the country.
- Use of digital payment involves some financial burden on customers as well as merchants. In India, the high cost is amongst the major lacunae in encouraging people to adopt e-payment. However, the government has, for example, taken it upon itself to bear MDR on transactions up to Re2,000 through debit cards, UPI, and AePS, for 2 years from 1 January 2018. The RBI has also capped MDR charges for debit card transactions at 0.4% and 0.9% for merchants with turnover of Re2 million and above Re2 million, respectively. Still, both consumers and merchants pay an e-payment cost on credit cards and, in some cases, on debit cards, which should be withdrawn for at least small consumer transactions.
- India is amongst the countries most targeted by cyber criminals. The government should therefore establish IT infrastructure to secure customer and merchant data.
- Inequality in digital literacy is massive across population and geography. The government should promote digital literacy, especially in rural and semi-urban areas.
- Data protection and consumer privacy laws are needed to assure consumers that their information and data are safe.
- E-payment through UPI had the highest growth rate and should be popularised and incentivised.
- As India is a leader in software development, its companies should build local service providers' capacity to secure data.
- Laws dealing with the online market, such as the IT Act, 2000; Consumer Protection Act, 1986; and the Indian Contract Act, amongst others, should be strengthened to bolster e-commerce. More importantly, a single law governing e-commerce should be passed.

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- Grievance redressal mechanisms should be strengthened.
- Data from private gateways should be reported to the RBI. This will enable policymakers to gauge the growth trajectory of e-commerce, which will help them pass optimal regulations.

To establish India's e-commerce connectivity with ASEAN and rest of the world, the country should focus on (1) improving existing ICT infrastructure, encompassing underserved regions; (2) establishing adequate logistics infrastructure in areas such as the north-eastern states that border ASEAN countries; (3) creating a more friendly and secure environment for e-payment by allaying cybersecurity concerns, ensuring digital and financial inclusion, guaranteeing a strong grievance redressal mechanism, and optimising fees levied on e-payment instruments; and (4) inducing transparency in the payment framework, where aggregate transaction data is available to the public. This data will enable policymakers to establish policies and policy think tanks advocating for evidence-backed policy reforms.

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