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**Research Paper on Role of Digital Public Infrastructure in  
addressing development challenges**



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We apologize in advance for any error or omission.

## **Executive Summary**

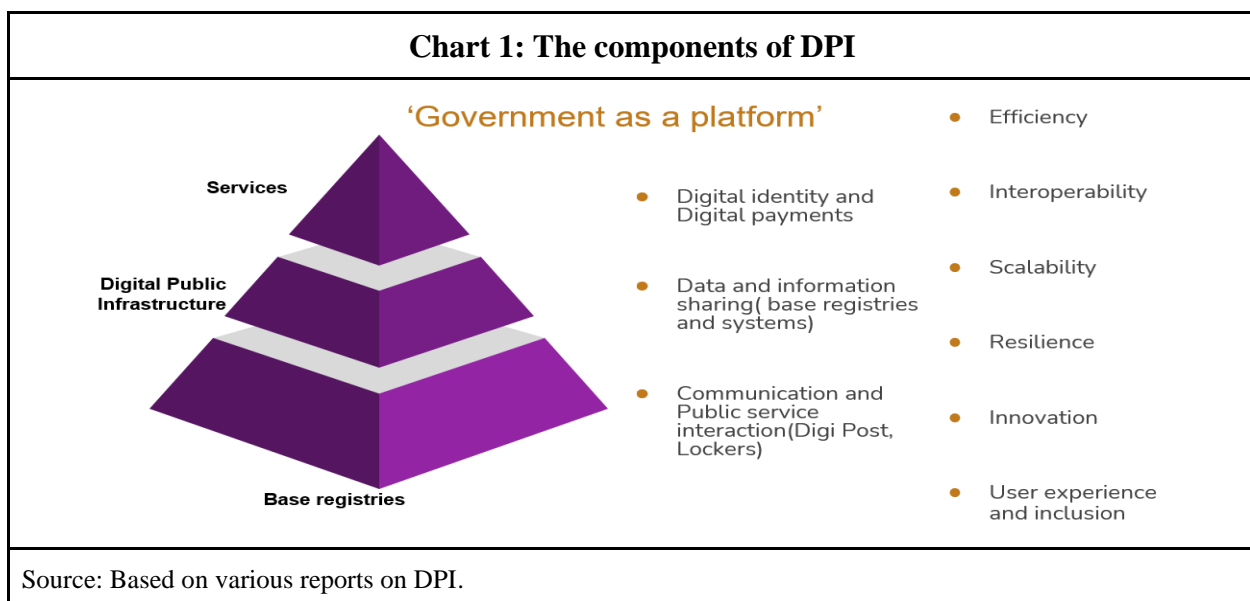
Digital Public Infrastructure (DPI) is being seen as one of the most efficient ways to deliver public services to citizens. DPI is defined as shared digital systems that are secure and interoperable and that can support the inclusive delivery of and access to public and private services across society (OECD Public governance paper, Dec 2024). Governments play a pivotal role in designing, developing and managing DPI, as well as in leveraging DPI systems to increase efficiency and coherence in the implementation of digital government policies. Building robust DPI requires addressing governance challenges such as funding, public-private collaboration and robust safeguards including for privacy and security. As DPI becomes a global priority, enhanced cross-border co-operation is also vital to address issues like resilience and to ensure effective DPI across diverse economic contexts. This joint paper delves into the building blocks of the DPI ecosystem in India and UK observes that both nations could play a positive role in building a cross-border remittance corridor as there lies huge potential to benefit consumers through reduction in transaction costs. This also augurs well in the light of the Sustainable Development Goal that encourages nations to reduce the transaction cost to less than 3% by 2030 and to eliminate remittance corridors with costs higher than 5%. Stakeholder discussions brought out the expectation from both the governments on continuing and further strengthening initiatives to lead collaborative projects globally to help digitally native countries to build the DPI layers so that citizens across the globe could benefit from the advances made in India and the UK. Special mention has been made for collaboration in cyber security as this requires multilateral support both financially and in technology exchanges.

## Role of Digital public infrastructure (DPI) in addressing development challenges

### 1. Introduction

1.1 Digital solutions and technologies permeate individuals, communities, nations and the world at large, in various walks of life. They look to find innovative and efficient solutions to challenges including financial inclusion, healthcare, agriculture, mobility, to name a few. The emergence of the phenomena of Digital Public Infrastructure (DPI) is relatively recent and is generally understood as an interoperable, open and inclusive ecosystem that leverages technology and market participation to achieve socio-economic goals. DPI goes way beyond digital infrastructure – creation of Information, Communication and Technology (ICT) and network infrastructure – as well as mere digitization of existing physical processes and workflows (G20 Task Force on DPI, 2024). DPI has been rolled out by various countries across the globe in pursuance to their respective domestic requirements<sup>1</sup>.

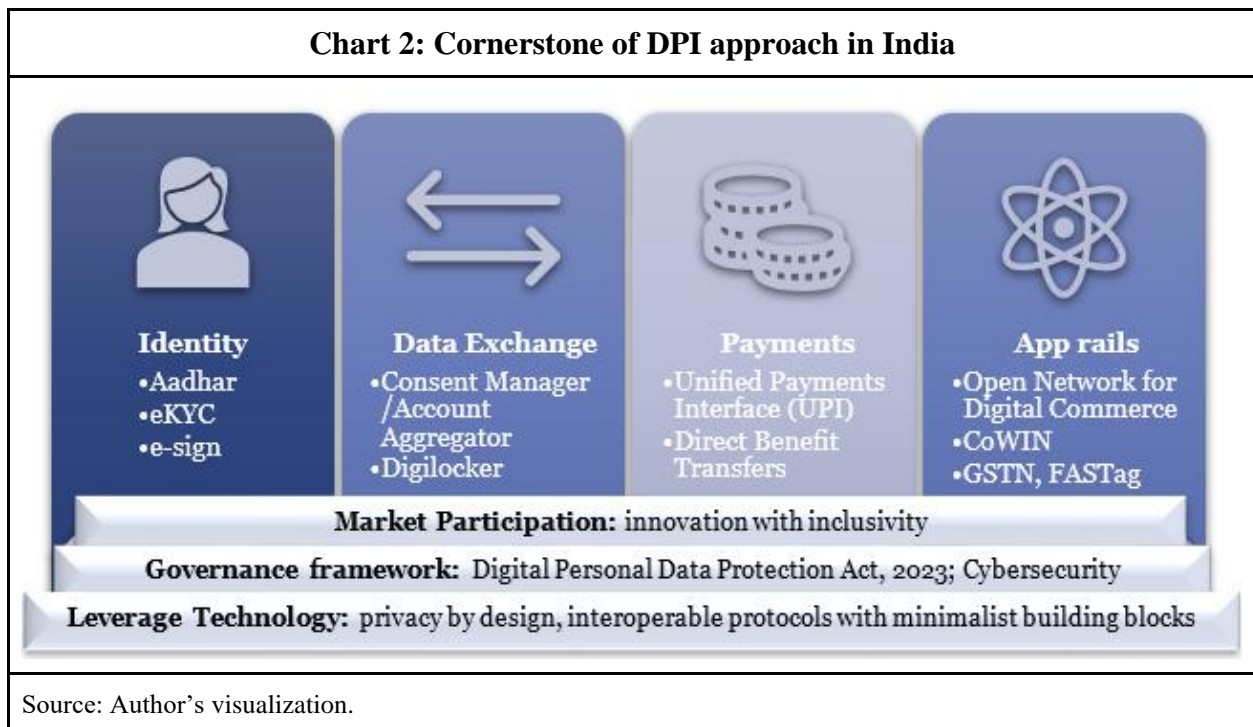
1.2 Going forward, there is much promise in Artificial Intelligence (AI) and DPI reinforcing each other for the benefit of both. DPI can use AI for enabling language localization, enhance service delivery, bolster cybersecurity and foster innovation whereas DPI ‘plays a pivotal role in upholding ethical and responsible AI standards, emphasizing fairness, transparency, and accountability in AI-driven decision-making processes’ (G20 Task Force on DPI, 2024).



<sup>1</sup> See Global DPI Repository (GDPIR), at <https://www.dpi.global/>.

## 2. Digital Public Infrastructure in India

2.1 India's digital infrastructure has experienced a profound transformation, beginning about 2 decades ago, establishing the country as a global leader in digital adoption. The rapidly expanding digital economy, fueled by innovations in cloud computing, artificial intelligence (AI), machine learning (ML), and digital governance, continues to drive progress. India's infrastructure is constantly adapting to meet the increasing demands of both the public and private sectors. A range of key initiatives and projects has been introduced to fortify the nation's digital framework, ensuring that government services are accessible, scalable, and secure, while also supporting economic growth and improving the lives of its citizens. India has been one of the frontrunners in unpacking DPI in various interventions, with 'India Stack' being one of the early initiatives.



2.2 The Digital India and universal connectivity initiatives by the Government of India has heralded a significant transformation of the digital landscape in the past decade with accessibility, affordability, inclusion, and empowerment being at its cornerstone. These have not only enhanced connectivity but also catalyzed innovation, e-governance, and digital entrepreneurship across the nation, laying a robust foundation for India's digital future.

<b>Table 1: Improvement in metrics of digital connectivity over the past decade</b>			
Metric	March 2014	March 2024	% increase
Broadband Definition	>= 512 Kbps	>= 2 Mbps	300%
India's Ranking in Avg Internet Download Speed	130	16	Improved by 114 ranks
Average Download Speed	4.18 Mbps	105.85 Mbps	2432.29%
Internet Subscribers (in mn)	251.59	954.40	279.34
Total Subscribers (in mn)	933	1199.28	28.54
Urban Tele-density	145.78%	133.72%	-8.27
Rural Tele-density	43.96%	59.19%	34.64%
Overall Tele-density	75.23%	85.69%	13.90%
Average Data Cost/GB	₹268.97	₹9.18	-96.58%
Average Data Consumption	0.26 GB	20.27 GB	7696%

Source: PIB release dated 6 August 2024. <https://tinyurl.com/48aahks2>.

2.3 Under BharatNet, 2,13,570 Gram Panchayats have been connected, 6,89,065 km of Optical Fibre Cable (OFC) laid, 10,56,968 Fibre-To-The-Home (FTTH) connections commissioned, and 104,574 Wi-Fi hotspots installed for last-mile connectivity, as of July 2024. Moreover, under the Universal Service Obligation Fund (USOF) around 9,000 villages have been connected with 4G services. This initiative ensures that even the most inaccessible regions gain access to modern telecommunications, bridging the digital divide and fostering inclusive growth.

<b>Table 2: Achievements under Digital India</b>		
S.N.	Initiative under Digital India	Description / Status
1	Data Centres	The National Informatics Centre (NIC) has established state-of-the-art National Data Centres (NDC) in Delhi, Pune, Bhubaneswar, and Hyderabad, providing robust cloud services to government entities, also featuring essential disaster recovery and hosting services, ensuring continuity. Also, NDC – North East Region bolsters capacities to address unique requirements of the region.

2	National Informatics Centre (NIC) National Cloud Services	The Enhancement of National Informatics Centre (NIC) National Cloud Services project, launched in 2022, endeavors to further upgrade the national cloud infrastructure, enabling faster and more efficient delivery of e-Governance services. The GI Cloud (MeghRaj) initiative seeks to provide ICT services via Cloud to all Government Departments across the Centre and States/UTs, also facilitating development and deployment of e-Gov applications such as digital payments, identity verification, and consent-based data sharing.
3	Digilocker	Platform for the issuance, authentication and verification of documents, with over 37 crore registered users, in line with vision for paperless governance. The Entity Locker, an extension of this service, is designed to empower organizations by providing secure cloud-based platform to store, share, and verify digital documents, promoting further adoption of digital document management.
4	Digital Infrastructure for Knowledge Sharing (DIKSHA)	World's largest education platform. As on 22 <sup>nd</sup> July 2024, 556.37 crore learning sessions have been imparted using DIKSHA. It has achieved 17.95 crore course enrolments and 14.37 crore course completions.
5	Government e-Marketplace (GeM)	Government procurement
6	UMANG	Mobile app with over 700 mn users, providing a unified platform for easy access to about 2077 services across various sectors, including agriculture, health, education, and pensions. It is available in 23 multi-lingual languages (for top 100 services).
7	API SETU	Open APIs enabling seamless data exchange and service delivery across government systems. Over 6,000 APIs have been published, facilitating more than 312.01 crore transactions. With 1,700+ publishers, including key entities such as PAN, Driving License, Vehicle Registration, COVID Vaccination Certificate, and CBSE, the platform also serves more than 634 consumers.
8	Ayushman Bharat Digital Mission, Co-WIN, Arogya Setu & e-sanjeevani	Pivotal in health services, including vaccination tracking and contact tracing; telemedicine, etc.
9	National Knowledge Network (NKN)	High-speed data communication network designed to connect National and State Data Centres, State-Wide Area Networks, and various Digital India initiatives and interconnects knowledge institutions across India to promote resource sharing and collaborative research. The network has successfully established 1,803 links with institutions and 637 links with district centres, enabling digital governance and the efficient delivery of e-Government services.

10	Common Services Centres (CSCs)	As on October 2024, over 5.84 lakh CSCs are operational across the country, including 4.63 lakh at the Gram Panchayat level, the initiative has facilitated the delivery of more than 800 services ranging from government schemes to education, telemedicine, and financial services. Further, Digital India Common Service Center (DICSC) project is also envisioned, starting with Pilibhit and Gorakhpur. This initiative will establish one model DICSC center in nearly all gram panchayats across 10 districts, totaling 4,740 centers nationwide. Each CSC will be equipped with high-speed broadband connectivity and modern infrastructure to function as a multi-functional service center. This project aims to empower Village Level Entrepreneurs (VLEs), fostering local economic growth and creating job opportunities. The initiative will also ensure transparent and sustainable service delivery through centralized technical monitoring. Additionally, GPS-enabled mobile vans will be deployed to promote government schemes and deliver essential services directly to remote areas.
11	MeriPehchaan	A National Single Sign-On (SSO) service to authenticate and access various government services using a single set of credentials. Over 132 crore transactions have been processed on this platform, improving service delivery and reducing the complexities of managing multiple accounts and credentials.
12	e-Hastakshar (e-Sign)	Enables citizens to digitally sign documents, providing a legally accepted alternative to physical signatures. A total of 81.97 crore e-Signs have been issued by all ESPs, of which 19.35 crore were issued by CDAC under the e-Hastakshar project.
13	MyGov	citizen engagement initiative, allowing citizens to share ideas, opinions, and feedback on various government policies and programs. With over 4.89 crore registered users, MyGov fosters transparency and encourages active citizen participation in governance.
14	CollabFiles and GovDrive	CollabFiles is a centralized platform for government officials to create, manage, and share office documents such as spreadsheets and text files. It integrates with platforms like e-Office and NIC email and ensures secure access via government-issued email IDs, and maintains records of document sharing. GovDrive is a cloud-based, multi-tenant platform offering storage as a service for Government of India officials. It enables secure storage, sharing, synchronization, and management of documents across devices, allowing officials to store, access, modify, or delete files and folders online through the GovDrive application.

Source: PIB release dated 8 December 2024. <https://tinyurl.com/yhah3nda>.

## **Digital Identity**

2.4 Aadhaar is perhaps the world's earliest digital ID system, conceived as early as 2005. It is a 12-digit individual identification number issued by the Unique Identification Authority of India (UIDAI) on behalf of the Government of India. The Vision statement of the UIDAI is, 'To empower Aadhaar number holders of India with a unique identity and a digital platform to authenticate anytime, anywhere'. Amongst its mission statements include, 'To provide for good governance, efficient, transparent and targeted delivery of subsidies, benefits and services...'; 'Ensure availability, scalability and resilience of the technology infrastructure'; and 'To ensure security and confidentiality of identity information and authentication records of the Aadhaar number holders' which categorically resonate the fundamental underpinnings of DPI. Total Aadhaar generated stands at more than 1.3 billion as on 12 December 2024, making it the world's largest digital ID program. Aadhaar has use cases in financial services; telecom; e-governance and public services; healthcare sector; employment verification; educational institutions; real-estate transactions; and transportation and logistics, to name a few.

2.5 Aadhaar number is a unique, random number devoid of any intelligence. Only minimal biometric and demographic information is sought during enrolment that in turn facilitates the process of de-duplication. Aadhaar is characterized by, 'optimal ignorance' i.e., UIDAI does not hold or receive non-essential data i.e., data apart from the minimal data mentioned above, within its systems. The system does not have linkage to other information such as Permanent Account Number (PAN) and driver's licence. Further, specific transactional data remains federated across systems of associated user agencies and not a centralized common database. Also, Aadhaar seeding is a 'one-way' linkage wherein UIDAI is not privy to any data held by user agencies.

2.6 The data security, privacy safeguards and governance framework of Aadhaar is both robust and sophisticated. It is largely built-in the design of the architecture itself. No incident of breach or leakage of core biometrics from UIDAI servers has been reported till date. UIDAI complies to ISO/IEC 29100:2011 for CIDR; certified for ISO/IEC 27701:2019 relating to privacy information management system. Further, the Governance Risk Compliance and Performance framework and forensic lab to boost fraud investigation capacity are additional levers in this regard.

<b>Table 3: Key regulations of the Aadhar Act</b>		
<b>SN</b>	<b>Section / provision</b>	<b>Implication</b>
a	Section 29: Prohibition of sharing or disclosure of core biometric for any purpose	Violation punishable under Section 37 of the Act with imprisonment up to three years.
b	Unauthorized access to Central Identities Data Repository (CIDR)	Punishable with imprisonment up to 10 years (Section 38)
c	Tampering of data in CIDR	Punishable with imprisonment up to 10 years (Section 39)
d	Ensuring that enrolments and authentications are done under a secure process	Aadhaar (Enrolment and Update) Regulations, 2016 wherein responsibility and accountability of all the agencies involved in the process are clearly defined.

Source: UIDAI annual report. <https://tinyurl.com/49u4mst3>.

### **Direct Benefit Transfer**

2.7 The Direct Benefit Transfer was started on 1 January 2013 to improve public service delivery of welfare schemes by the Government by making them more efficient in terms of access, information and fund flow and more accurate targeting of the beneficiaries, de-duplication and reduction of fraud. Currently, 54 ministries of the Union Government are implementing 319 schemes using DBT. The total DBT during FY25 was ₹371309 crore through 387 crore transactions. The cumulative DBT till date is a staggering ₹4047482 crore. JAM (Jan Dhan -- Aadhaar - Mobile) trinity has heralded a digital revolution in promoting financial inclusion in the country by linking ‘Jan dhan’ bank accounts, aadhar and mobile number. E-KYC uses Aadhaar ID system to verify the identity of end users quickly, allowing FSPs to enroll customers easily and directly activate new services, such as mobile connections and bank accounts.

### **Modular Open Source Identity Platform (MOSIP)**

2.8 Governments world over have recognized and experienced the role of digital ID systems in promoting individual access to financial equity, healthcare, ration and other essential services. MOSIP was incubated at the International Institute of Information Technology (IIIT) Bangalore as a global digital public good to support governments in adopting multipurpose foundational digital ID systems or by enhancing their existing systems, while ensuring complete ownership over their country’s digital infrastructure. It harnesses the power of open-source technologies and

embraces the best practices of scalability, security and privacy. Currently, 7 national roll-outs and 13 pilots are in progress by MOSIP.

### **Account aggregation**

2.9 One of the guiding principles of India's approach to financial innovation is that citizens should be empowered by the wealth that their data generates. Account Aggregators (AA) use technology to assist in consent-based, simple and secure exchange of data between financial information user and financial information provider. AAs were created through an inter-regulatory decision by Reserve Bank of India (RBI), Pension Fund Regulatory and Development Authority (PFRDA), Securities and Exchange Board of India (SEBI) Insurance, Regulatory and Development Authority (IRDAI) and Financial Stability Development Council (FSDC). The AA encrypts data, does not store / process data, and also allows to give / revoke access to active consents anytime. As on the end of November 2024, cumulatively, more than 133 million consent requests have been successfully fulfilled. Financial Information Provider (FIP) are institutions like banks / NBFCs that hold user data. Financial Information Users (FIU) receive digitally signed data from FIPs via Account Aggregators that is in-turn used to provide various services to the consumer like loans, insurance, or wealth management. Absence of physical document handling prevents leakage / misuse of information. Further, there is no need to share login credentials with third parties that helps avoiding instances of security breach. The most important use cases of AA include personal wealth management, insurance / pension / securities / bank account opening, risk profiling, viable small ticket products and personal / business (especially MSME) loan processing.

### **Payments**

2.10 Payment and settlement systems are essential for smooth functioning of any economy. Reserve Bank of India (RBI) has been making consistent efforts to promote digital payments in the country while maintaining their safety and security. RBI endeavours to ensure that India has 'state-of-the-art' payment and settlement systems that are not just safe and secure, but also efficient, fast and affordable. Unified Payments Interface (UPI) is a system that powers multiple bank accounts into a single mobile application (of any participating bank), merging several banking features, seamless fund routing & merchant payments into one hood. It also caters to the

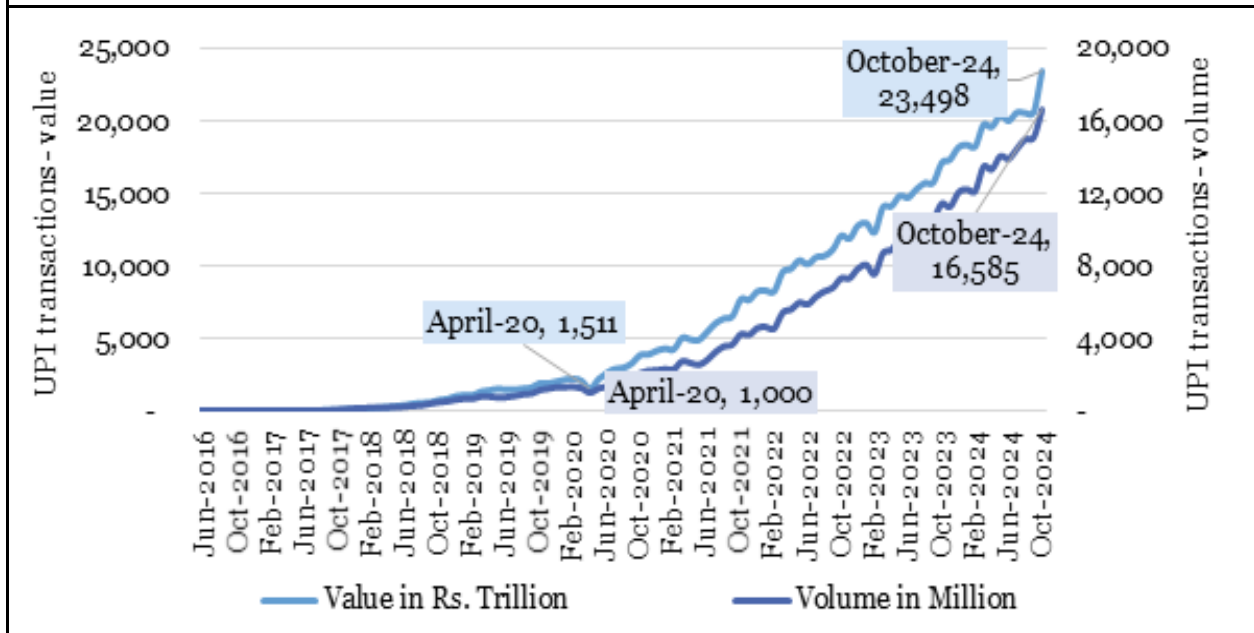
“Peer to Peer” collect request which can be scheduled and paid as per requirement and convenience.

2.11 The features that make UPI unique include immediate money transfer through mobile device round the clock 24\*7 and 365 days; single mobile application for accessing different bank accounts; single click 2 Factor Authentication; virtual address of the customer for Pull & Push provides for incremental security with the customer not required to enter the details such as Card no, Account number; IFSC etc.; Merchant Payment with Single Application or In-App Payments; Utility Bill Payments, Over the Counter Payments, QR Code (Scan and Pay) based payments and Raising Complaint from Mobile App directly. The participants in UPI include Payer PSP, Payee PSP, Remitter Bank, Beneficiary Bank, NPCI, Bank Account holders and merchants.

2.12 In 2021, UPI continued to innovate with the introduction of e-RUPI, 123Pay, UPI Plug-In, Aadhaar OTP onboarding, RuPay Credit Card on UPI, and UPI Lite. Each of these features has been meticulously designed to serve a range of customer needs. E-RUPI, for example, is a person- and purpose-specific voucher management system, presently allowing more than 13 government schemes to provide direct benefits to specific beneficiaries for designated purposes.

2.13 To provide convenience of UPI to feature phone users, 123 Pay was introduced, currently available in 20 languages, thus reaching a broad demographic. Additionally, UPI now supports RuPay credit card transactions, enhancing the versatility of our platform. To augment efficiency and customer convenience, UPI Plug-In was introduced, seamlessly integrating UPI into various merchant applications, ensuring a native and user-friendly experience. To promote financial inclusion, Credit Line on UPI, Conversational Payments (Hello! UPI & BillPay Connect) and UPI LITE X were launched in September 2023. ‘Credit Line on UPI’ enables pre-sanctioned credit lines from banks via UPI and will revolutionize customer access to credit, fostering a more streamlined and digital banking ecosystem. With this, the process of availing, connecting, and utilizing credit lines will be significantly expedited, driving economic growth and progress.

**Chart 3: Spectacular growth in UPI transactions – promoting financial inclusion during the COVID-19 pandemic and beyond**



Source: NPCI website. <https://www.npci.org.in/>.

2.14 Conversational UPI Payments and Conversational Bill Payments underscores the emergence of AI-enabled transactions which will further deepen the reach and use of digital payments in the country. ‘Hello! UPI’, an AI-voice-enabled payment feature built by Bhashini (under MeitY) along with NPCI, allows users to make conversation-based UPI transactions in Hindi and English, using both feature phones and smartphones. This expansion will broaden payment accessibility for most Indians who are fluent in their native languages, providing significant benefits to senior citizens and the digitally inexperienced. Additionally, through ‘BillPay Connect’, customers can conveniently fetch and pay their bills by sending a simple ‘Hi’ on the messaging app or through their smart home devices by giving voice commands.

2.15 ‘UPI LITE X’ addresses challenges of remote areas by enabling offline UPI payments and making digital transactions accessible even in low-connectivity regions. It will be accessible to anyone with a compatible device that supports Near Field Communication (NFC). In addition to Scan and Pay (QR), UPI NFC enabled phones can now be used to ‘Tap & Pay’. With this functionality, users now have the option to simply tap NFC-enabled QR codes at merchant locations to complete their payments.

2.16 To facilitate the efficient delivery of frictionless credit, Unified Lending Interface (ULI) was announced at the RBI@90 Global Conference in August 2024. The pilot of ULI (previously known as the Public Tech Platform for Frictionless Credit) began in August 2023. Just like the UPI transformed the payments ecosystem, the ULI will play a similar role in transforming the lending space in India.

2.17 The ULI was developed by RBIH and co-conceptualized with the Reserve Bank of India (RBI). ULI is a technology platform built to facilitate easy access to authenticated data from various sources, through standardised APIs to which all lenders can connect seamlessly through a ‘plug and play’ model. The platform is unlocking critical financial, non-financial and alternate data for lenders including digitised state land records, milk pouring data from milk federations, satellite data and property search services, to name a few, through a single interface. With a one-time integration with the platform, lenders can leverage information from all these sources, eliminating the need for them to carry out multiple bilateral integrations with each data and service provider.

### **Cross border CBDC**

2.18 The report by the CPMI-MC published in 2018 defines CBDCs as new variants of central bank money different from physical cash or central bank reserve/settlement accounts. That is, a central bank liability, denominated in an existing unit of account, which serves both as a medium of exchange and a store of value. The four different properties of money are: (i) issuer (central bank or not); (ii) form (digital or physical); (iii) accessibility (wide or narrow); and (iv) technology (peer-to-peer tokens, or accounts). Based on these four properties, the CPMI-MC report provides a taxonomy of money (‘The Money Flower’), which delineates two broad types of CBDC: general purpose and wholesale – with the former type coming in two varieties. Reserve Bank defines CBDC as the legal tender issued by a central bank in a digital form. It is the same as a sovereign currency and is exchangeable one-to-one at par (1:1) with the fiat currency<sup>2</sup>.

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<sup>2</sup> See RBI’s concept note on CBDC for an in-depth discussion. <https://tinyurl.com/mtxznxnp>.

2.19 As per the results of 2021 Bank for International Settlements (BIS) survey on CBDCs conducted on 81 central banks, 90% of central banks are engaged in some form of CBDC work and more than half are now developing them or running concrete experiments.

### **Cybersecurity**

2.20 Cybersecurity in India is primarily governed under the provisions of the Information Technology (IT) Act, 2000 (amended in 2008) and the Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011 (also known as SPDI rules). Broadly, aspects pertaining to data, information, systems and infrastructure security come under their purview. Further, regulators also oversee the cybersecurity framework – for instance, SEBI, RBI, IRDA and PFRDA for the financial sector. The RBI had come out with the master direction for cybersecurity in banks in 2016. A further consolidation happened vide the RBI Master Direction on Information Technology Governance, Risk, Controls and Assurance Practices to ensure robust IT frameworks across financial institutions also including small finance banks, payments banks, Non-Banking Financial Companies (NBFCs) and credit information companies.

2.21 Key components in the cybersecurity apparatus include CERT-in (Indian Computer Emergency Response Team) and the National Critical Information Infrastructure Protection Centre (NCIIPC). CERT-in is the nodal agency / “first responder” to computer security incidents as and when they occur. NCIIPC, an organization set up under Section 70A of the IT Act, 2000 (amended in 2008) is designated as the National Nodal Agency in respect of Critical Information Infrastructure Protection. The FSB in 2023 came out with the format for Incident Reporting Exchange (FIRE) to bring about greater convergence in cyber incident reporting by promoting common information elements for incident reporting while allowing for flexible implementation practices.

### **Open Network for Digital Commerce (ONDC)**

2.22 ONDC Network, based on becn protocol, is an open network for exchange of goods and services via digital or electronic network. It allows buyers and sellers to transact seamlessly, irrespective of the platform or applications they use. The architecture is significantly different from

the existing e-commerce models as it is platform-agnostic. It adopts a decentralised and participatory approach to market innovation. The foundations are similar to hypertext transfer protocol for information exchange over the internet, simple mail transfer protocol for exchange of emails and unified payments interface for payments. These open protocols would be used for establishing public digital infrastructure in the form of open registries and open network gateways facilitating exchange of information between providers and consumers, who would in-turn use any compatible application of their choice for exchange of information and carrying out transactions over ONDC. In this manner, ONDC goes beyond the current platform-centric digital commerce model where the buyer and seller are compelled to use the same platform to execute a transaction. This enhances access to small enterprises to increase their digital footprint and reach, particularly those hitherto not on boarded on digital commerce networks.

2.23 Inclusiveness is not only a phenomenon for sellers, but for consumers as well. Consumers can potentially discover any seller, product or service by using any compatible application or platform, thus increasing freedom of choice for consumers with an enriched variety of local wares. The journey of ONDC has been intense, eventful and visionary since the establishment of an advisory council by the Department for Promotion of Industry and Internal Trade in June 2021 right until the beta launch of ONDC in September 2022. The period April to November 2024 has witnessed more than 44 million retail orders while total network orders until November 2024 are about 142 million.

### **3. Digital Public Infrastructure in UK**

3.1 Economic growth<sup>3</sup> has been adopted as the number one mission of the new government. Through the growth mission, the government will deliver a milestone of higher living standards in every part of the United Kingdom by the end of the Parliament. This will be achieved through driving innovation, investment and the adoption of **technology to seize the opportunities of a future economy, from Artificial Intelligence to net zero.** In the journey to make citizen centric service delivery, digital innovation is of prime importance. In this context, this section highlights four main programs that have been at the forefront in driving delivery of digital services to citizens.

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<sup>3</sup> <https://www.gov.uk/missions/economic-growth>.

## **Gov.UK One Login**

3.2 HMG implemented GOV.UK One Login<sup>4</sup> to provide authentication and identity proving services for all government services to citizens. The mission is to ‘make it easy for everyone to access government services’. Users can choose to use the GOV.UK One Login app, which has been developed and is available for download, to prove their identity when accessing services. The app allows a user to quickly, easily and securely verify their identity, using their smartphone. As of July 2023, GOV.UK One Login has already successfully been used by over 1.5 million users to prove who they are, while the app has now been downloaded two million times. The program is expected to make savings of over £700 million over three years. As of October 2024, 50 services are using GOV.UK One Login for authentication and identity-proving. HMG is targeting to bring over 100 services by 2025. The services are being rolled out to all government departments. Currently, eight key services are operational where citizens can prove their identity through using passports, driving licence or biometric residence permits.

3.3 This shows that GOV.UK One Login is fulfilling its purpose, empowering more teams to streamline their processes, and delivering tangible benefits for departments and end-users. Few examples of the benefits to UK citizen includes

- a. **Simplified Access:** Gov.UK One Login provides a single, unified way to sign in to various government services using just one set of credentials (email and password). This eliminates the need to remember multiple usernames and passwords for different services.
- b. **Enhanced Security:** The system uses two-factor authentication, adding an extra layer of security to protect personal information and reduce the risk of unauthorized access
- c. **Streamlined Identity Verification:** When creating a Gov.UK One Login, users go through a thorough identity verification process. This ensures that their identity is securely verified, making it easier to access services that require proof of identity
- d. **Future Integration:** Over time, Gov.UK One Login is expected to replace other sign-in methods like Government Gateway, making it the standard for accessing all government services online. This is aimed to further simplify interactions with government services
- e. **User-Friendly Management:** Users can easily update their login details, such as email addresses and passwords, and manage their security settings through a single portal

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<sup>4</sup> <https://www.gov.uk/using-your-gov-uk-one-login>.

- f. **Cost efficiency** : One Login is value for money as it reduces the operational costs for the government by removing the need of multiple login systems. This leads to better allocation of resources

3.4 Overall, Gov.UK One Login aims to enable accessing government services more convenient, secure, and user-friendly for citizens. The security measures adopted to protect citizen's data is a special feature of the Gov.UK One Login program. Data is collected to monitor use of the sites to identify any security threats. These include measures like:

- **Two-Factor Authentication:** This adds an extra layer of security by requiring not just a password, but also a code sent to your phone or email.
- **Data Protection:** The system adheres to strict data protection regulations. Personal data is stored securely within the European Economic Area (EEA) and is not sold or rented to third parties.
- **Regular Monitoring:** The system is continuously tested and monitored to detect and address any security threats promptly.
- **Privacy Policies:** Detailed privacy policies explain the legal basis of processing citizen's data and sets out the mechanisms of data protection with the aim of ensuring transparency and trust. It lists out the rights of citizens including children's rights and ways to settle disputes, if any.

3.5 Citizens with low digital skills who find it difficult to operate the app through a smart phone will continue to receive the traditional face to face services. This would give them the confidence to use GOV.UK One Login and access services. There will also be help for those with low digital skills, through assisted digital and face to face options, giving more people the confidence to use GOV.UK One Login and access services. Since April 2021, Gov.UK has conducted user segmentation surveys and collected a rich pool of qualitative data and insight around people's lived experience of proving digital identities and using its services. The purpose is to understand the scale of digital inclusion across different user groups and evidence ways to address the gaps.

3.6 It is important to mention the efforts of Building Digital UK sponsored by DSIT and DCMS that aims to bridge the digital divide with UK. and enable people across the UK to enjoy the

advantages of cutting-edge connectivity for their families, businesses and communities. The Annual Report and Accounts mentioned that by the end of March 2024, more than 81% of UK homes and businesses had access to gigabit-capable broadband thanks to the combined efforts of commercial and government-funded delivery. The latest data (October 2024) shows that the initial target of 85% gigabit coverage has been met over a year early. The government is committed to achieve a target of 99% coverage by 2030.

1. **Project Gigabit:** A major government programme to deliver gigabit-capable broadband to homes and businesses across the UK. The programme supports the government's ambition for full gigabit broadband coverage by 2030, making sure that people have the same access to fast and reliable connectivity wherever they live, work and study. Project Gigabit covers areas across the UK and works closely with the devolved administrations on its delivery in Scotland, Wales and Northern Ireland. Its focus is on rural areas with 92% of premises benefiting from the program subsidies were rural, compared to 23% of all premises in BDUK's premises base in the UK being classed as rural.
2. **Shared Rural Network (SRN):** A joint investment with the UK's four mobile network operators to improve mobile connectivity in rural parts of the UK<sup>[footnote 1]</sup>. The programme will increase 4G coverage, ensuring that by December 2025, 95% of the UK's landmass will have coverage from at least one operator, and increasing the areas where all four operators deliver coverage. The ARA mentions that the 4G coverage across the UK reached 93% in January 2024, an increase from 91% in March 2020 when the SRN agreement was signed. Since the end of the reporting period, in September 2024 Ofcom announced that coverage reached 94.9%.

3.7 The target is to improve broadband and mobile coverage. Delivering the mission is a team effort across government, industry, local councils, devolved administrations, regulators, consumer groups and citizens. BDUK works with these partners to ensure that people can access the reliable digital connectivity that can transform their lives. Also, the government<sup>5</sup> has announced a new plan to leverage technology and AI tools like "Humphrey" to streamline public services, eliminate delays through improved data sharing, and reduce costs, including consultant spending.

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<sup>5</sup> <https://www.gov.uk/government/news/shake-up-of-tech-and-ai-usage-across-nhs-and-other-public-services-to-deliver-plan-for-change>.

3.8 The blueprint for a modern digital government, published in January 2025, sets out how the government will also overhaul how it delivers digital services and spends £23 billion a year on technology starting with a Digital Commercial Centre of Excellence<sup>6</sup>.

### **Smart Data**

3.9 The UK is working towards creation of a smart data economy to facilitate economic growth and innovation. Smart data is the secure sharing of customer data with authorised third parties (ATPs). ATPs in retail banking currently use this data to provide services such as faster credit checks and better account management. Open Banking is an example of smart data in action, underpinning the UK's fintech success story.

3.10 Smart Data unlocks data for individuals and businesses. It allows businesses to easily access this data, with consumers' consent, to provide new services. HMG wants to encourage similar and interoperable schemes in sectors beyond retail banking, to realise a smart data economy. In doing so the UK is taking several steps, the most notable being the creation of a smart data economy. Through championing smart data, the UK government is facilitating the data economy to drive growth and innovation, and to enable services that ensure businesses and consumers get more for their money. To ensure sector-specific delivery enables a Smart Data economy, the government has taken three steps:

1. Introduced Smart Data legislation via the Digital Protection and Digital Information (DPDI) Bill to provide the legislative framework for future regulations.
2. Launched the Smart Data Council to build momentum and direct coordination of future Smart Data Schemes, including by developing practical understanding of interoperability and how to achieve it.
3. Developed a Smart Data Challenge Prize to identify cross-sector use cases from across the economy, building a network of innovators to inform the development of Smart Data schemes.

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<sup>6</sup> <https://www.ofcom.org.uk/internet-based-services/technology/mandated-interoperability-in-digital-markets/>.

## **DPDI Bill**

3.11 The UK is advancing its Smart Data initiatives through the Data Protection and Digital Information Bill (DPDI Bill)<sup>7</sup>. The bill supports the creation of a Smart Data economy, which will benefit seven sectors including five priority sectors- banking, energy, finance, and telecommunications, transport, and other sectors of interest namely home buying and retail. This would promote investment, productivity, competitiveness and economic growth by providing the right safeguards required for a smart data economy. The bill is currently progressing through the UK Parliament.

3.12 The DPDI Bill aims to regulate the processing of personal data, enhance privacy and electronic communications, and improve access to customer and business data. This will help the UK government deliver the benefits and safeguards required for a Smart Data economy. The Smart Data Roadmap<sup>8</sup>: Action the government is taking in 2024 and 2025 sets out how the government will use these new powers over the coming year by first identifying the opportunities and challenges in implementing Smart Data schemes in 7 sectors.

3.13 The government intends to use these powers to create a regulatory framework for data sharing in Open Banking. Wherever the government identifies the need for regulatory intervention in other sectors, the powers will be used to develop the appropriate regulations for the implementation of a scheme. Regulations will aim to answer questions like- identify what data should be shared, by who (the ‘data holders’), and how the data should be shared. This will be underpinned by the identification of relevant sector actors to provide enforcement, accreditation, and interface functions.

## **Smart Data Council**

3.14 The UK government established the Smart Data Council (SDC) in April 2023 with the aim to ensure a coordinated approach to Smart Data Scheme development<sup>9</sup>. The Council is formed of key government departments, regulators, industry bodies, and consumer groups. Smart Data

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<sup>7</sup> <https://bills.parliament.uk/bills/3430>.

<sup>8</sup> <https://www.gov.uk/government/publications/roadmap-for-digital-and-data-2022-to-2025/transforming-for-a-digital-future-2022-to-2025-roadmap-for-digital-and-data>.

<sup>9</sup> <https://www.gov.uk/government/collections/creating-a-smart-data-economy>.

Development Scheme. It has established three working groups to deliver products that will contribute to the development of consistent and interoperable Smart Data schemes. The three working groups include the sub groups for the Technical Infrastructure, the sub group on the Trust, Compliance and Consumer Protection, and the sub group on the Economic Models and Understanding Value. SDC also implemented the Smart Data Discovery Challenge.

### **Smart Data Discovery Challenge / Challenge Prize**

3.15 In October 2023, a government led coalition with business groups launched the Smart Data Challenge Prize inviting innovative thinkers from across industry and society to recommend new solutions that could make a difference for individuals and small businesses. The aim of the initiative was to identify the leaders of the Smart Data space with specific use cases from the energy, financial services, home buying, retail and transport sectors. The open call wanted people and partnerships to share their thinking for cross-sector smart data ideas that could benefit individuals, small businesses and wider society. In March 2024 four winners were announced and led to fruitful exchange of ideas, use cases that have the potential to create solutions to real life problems using data and technology. This is part of the wider program of Smart Data enabling work by the government which includes legislation giving greater powers to implement schemes, consultations and future policy development.

3.16 The Department for Business and Trade has launched the next round<sup>10</sup> of Smart Data Challenge inviting participants to submit innovative prototype solutions in Smart Data Sandbox to win funds from a pool of £600,000 GBP.

### **Smart Data Scheme Development**

3.17 The government has several schemes to explore the opportunities and challenges of sectors that aim to create longer-term regulatory frameworks in Open Fuel, Open banking, regulations for Pension Dashboards (specific deadline for all relevant schemes to have a connection by 31 Oct 2026), and launched the Centre for Finance Innovation and Technology which has explored Open Finance use case development as its first project. The Smart Data Schemes should be interoperable,

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<sup>10</sup> <https://www.gov.uk/government/news/government-led-coalition-launches-open-call-for-bold-and-innovative-ideas-using-smart-data>.

meet the four pillars of consumer trust, consent, consumer choice and support and redress; and the design of regulations should consider the implication on competition, innovation, consumers and the small and medium businesses.

### **DPI for development- FCDO initiatives for helping digitally native countries**

3.18 The UK is leading on partnerships with governments to enable nations to make progress in digital innovation. The Department for Science and Technology (DSIT) and the Foreign, Commonwealth Development Office (FCDO) lead the efforts in helping nations adapt digital innovation. Citing DSIT:

*We regularly win awards, and are recognised world leaders in public sector digital innovation. Digital government teams in the US, Australia and New Zealand were established on the same model, and follow very similar principles.*

3.19 In particular it is worth noting that The UK's engagement with the OECD's Digital Government and Open Data Unit opens up many opportunities for learning. *GDS digital practitioners have previously supported digital government reviews led by the OECD, in Chile, Slovenia and will be supporting upcoming OECD capacity building workshops in Thailand. Participating in interviews and discussions with other governments also brings back learnings and insights to help our own work and thinking<sup>11</sup>.* FCDO has helped governments to implement projects similar to make their citizens access government services.

### **Interoperability in Digital markets**

3.20 Interoperability in digital markets refers to the ability of a diverse set of digital systems(hardware, software, applications etc. ) to communicate with each other, on the building blocks of standardized protocols and frameworks. It's critical for DPI to be adaptable and interoperable to build on the infrastructure for service delivery. In the Discussion Paper on UK's interoperability in the context of digital markets, the Competition Markets Authority (CMA), identifies lack of interoperability as a potential obstacle for effective competition and innovation in mobile ecosystems, social media, cloud services, and online personal communication. To help

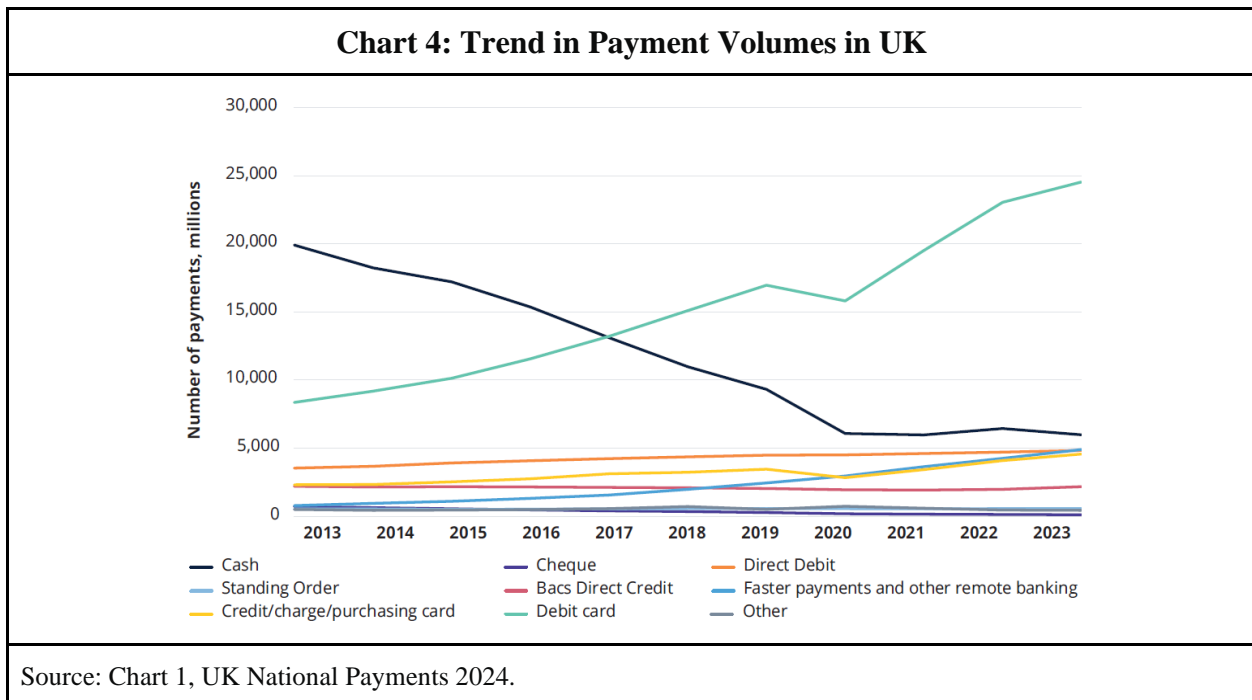
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<sup>11</sup> <https://gds.blog.gov.uk/2024/11/25/how-gds-partners-with-the-oecd-on-digital-government/>.

users switch to service providers to benefit from a range of service providers, or utilise complementary services, mandated interoperability is being looked at as a potential remedy. The *Digital Markets, Competition and Consumers Act, 2024*<sup>12</sup> facilitates data portability, ensures consumer protection and promotes innovation so that digital services are accessible and reliable.

### Digital Payments in the UK

3.21 The UK was one of the first countries to establish a system for near instant digital payments with the launch of Faster Payments System in 2008, and the UK pioneered Open Banking in 2016. The payments market has evolved over the period and has seen huge growth in online and contactless modes. The UK Payments Market 2024 report estimated 48.1 billion payments in 2023, of which consumers accounted for 41 billion payments and businesses accounted for 7.1 billion payments. Debit cards have seen a rising trend whereas cash has seen a reduction in usage across the period 2013-2023. Use of cash was 51% of all payments in 2013 and this has reduced to 12% in 2023. Mobile payments (using Apple Pay/ Google Pay) have seen a rising trend with over 34% of the population using mobile contactless payments at least once a month. One third of UK adults use mobile contactless payments.



<sup>12</sup> <https://www.gov.uk/government/news/digital-markets-competition-and-consumers-act-receives-royal-assent>

3.22 There has been a rise in next-generation payment methods, such as digital wallets, account-to-account (A2A) payments and Buy Now Pay Later (BNPL). Consumers are adapting the newer methods of making payments and have found to be moving away from traditional payment methods. The 2024 report cites that one in seven people in the UK have started using BNPL services for their purchases. The National Payment Vision 2024 mentioned that there are 11 million current users of Open Banking services- architect behind bank transfers.

3.23 For A2A and all such digital led payment mechanisms to work seamlessly and to widen the choices for both consumers and merchants in Open banking, the need for regulation of the next generation technologies, is crucial. To safeguard consumer interests in the retail payments arena, especially Open banking and tackling fraud, the National Payments Vision has provided direction on priority initiatives. It also outlines three key pillars to guide future activity- innovation, competition and security. Through the growth of artificial intelligence led innovation, the benefits and risks to consumers have to be balanced. Guardrails have to be established so that innovation is not compromised and safety nets are in place. The DPDI bill is also expected to set out the key guidance for safeguarding the risks from such developments. The independent Future of Payments Review 2023 provided recommendations on the steps needed to successfully deliver world-leading retail payments in the UK. It highlighted the role of the independent regulators – the Bank of England, Financial Conduct Authority and Payments Systems Regulator. They will be collaborating to provide the key leadership for initiatives in the payments context. The Review also points towards the necessary trust in the secure and resilient infrastructure that delivers the payment services to customers.

### **Digital Pound**

3.24 Central Bank Digital Currency (CBDC) is a currency with central bank's liability that serves as both store of value and medium of exchange function of money (different from physical cash and complementary). Govt. is committed to introduce primary legislation in the Parliament for the introduction of digital pound. The Bank of England<sup>13</sup> is making progress on the workstreams related to creation of the digital pound. The workstreams explore the mechanisms of

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<sup>13</sup> <https://www.bankofengland.co.uk/payment-and-settlement/cross-border-payments>.

operationalising the Digital Pound as well as the key benefits and challenges of implementing a digital currency. This will prepare the groundwork for the introduction in case the UK Parliament approves for a 'digital pound'.

#### **4. Review of the digital landscape in UK and India**

Both India and UK have embarked on the digital journey early on and have implemented several layers of the digital substack focusing on making citizen centric delivery of services. The digital ID system both in the UK and in India, collects or uses biometric data, has regulation for digital ID, has digital authentication function, enables Know Your Customer (KYC) packet collection. On the digital payments, India has operationalised the UPI on a national basis while the UK has implemented the Pay.UK. On data exchange, both UK and India have made progress in operationalising data architecture that works on the standardised frameworks, where API development is fully focused on standardization on the back on clear governance principles. The UK has published the data sharing governance framework. It provides guiding principles to avoid barriers for all government departments and agencies in adoption of data exchange systems. In India, the focus of data policy is to ensure that citizens reap the benefits of the data they generate. For this purpose, in 2016 the RBI established the legal framework for a class of regulated data fiduciary entities, called account aggregators, which enable customer data to be shared within the regulated financial system with the customer's knowledge and consent.

#### **5. Literature review on cross border payments**

5.1 In a global world, remittances are crucial to enable development as a huge stream of economic migrants send back money or goods to families, in origin countries that feed into the development linkage. The movement of funds back to the home country is known as remittance. International Monetary Fund (2009) observed that cross-border remittances significantly contribute towards financial inclusion and socio-economic development of households and communities especially in low and middle income and low income countries. World Development Report 2023 estimates 184 million people as migrants in 2023, of which half live in high income countries and one third live in developing countries. WDR noted that in 2023, remittances back to home countries totalled about \$656 billion, equivalent to the GDP of Belgium.

5.2 Also, it notes that remittances account for a significant share of GDP for smaller countries (~3% of GDP), making the cross border remittance an important channel to deliver on the development agenda. It is important that both senders and receivers have access to affordable and efficient mechanisms of international payment transfer. Since it involves multiple agencies, international payment service providers, national governments, private sector and so on, the role of multilateral organisations like the World Bank, United Nations Development Program, national governments, become important to drive the reduction of remittance costs in line with the Sustainable Development Goal benchmarks.

### **Action by Multilateral Organizations**

5.3 The United Nations Development Programme (UNDP) in its compendium of the potential of DPI (UNDP, 2023) has substantiated the strong case of DPI as a crucial enabler of digital transformation to accelerate progress and deliver on sustainable development goals (SDG). SDG 10 states to reduce inequality within and among countries with target 10.c therein being, *‘By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent’*. IFAD has observed that absence of adequate digital infrastructure and local digital payment solutions, particularly in receiving markets forces recipients to cash out their digital payments, limiting the full potential of digital remittances.

5.4 The G20 in 2020 endorsed the Roadmap for Enhancing Cross-Border Payments with 19 building blocks (Financial Stability Board, 2022) to achieve faster, cheaper, more transparent and more inclusive cross-border payments. Subsequent G20 presidencies have reaffirmed commitment towards the same as well as steered further progress worked upon by the Financial Stability Board (FSB); the Committee on Payments and Markets Infrastructure (CPMI) of the Bank for International Settlements (BIS); and relevant standard setting bodies (SSBs). In 2021 a set of quantitative targets to address the four global challenges of cost, speed, access and transparency across wholesale payments, retail payments and remittances, were endorsed (FSB, 2021) and subsequently, Key Performance Indicators (KPIs) were developed in 2022 across the key ‘priority themes’ of payment system interoperability and extension; legal, regulatory and supervisory frameworks; and data exchange and message standards (FSB, 2022). FSB in October 2024 reported overall progress in the KPIs during the first quarter of 2024 over the 2023 baselines and

inter-alia observed that, ‘the average cost of sending USD 200 remittances via banks increased, whereas the cost via other service providers mostly remained unchanged’ (FSB, 2024).

5.5 Project Nexus by the BIS Innovation Hub in Singapore is a collaboration including Central Banks and fast payment operators of Malaysia, the Philippines, Singapore and Thailand that aims to standardise the way in which fast payment systems connect with each other in a low-cost and scalable manner (*Project Nexus: Enabling Instant Cross-border Payments*, 2024). Further, as far as implementation is concerned, it is envisaged that Nexus Scheme Organisation (NSO) would be the managing entity with the BIS providing technical support. Lately, the CPMI has also come out with reports on governance and oversight; and a toolkit to promote harmonisation of application programming interfaces.

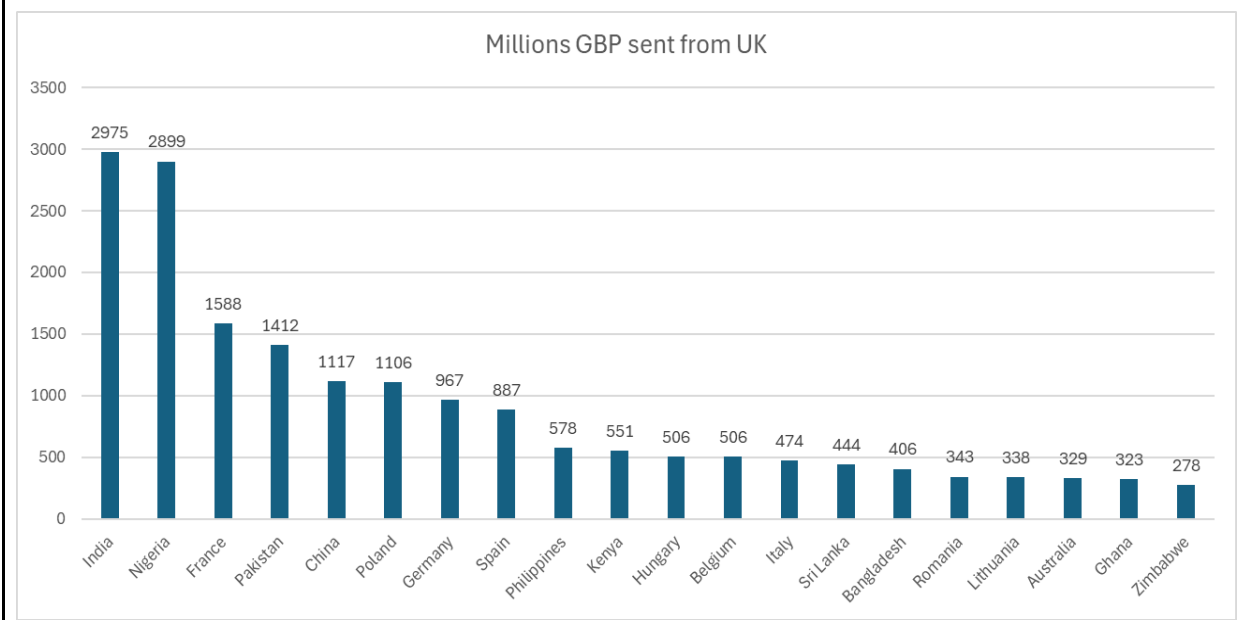
5.6 The agenda of DPI gained traction during the Indian G20 Presidency in 2023 in terms of accelerating development.

### **UK perspective**

5.7 The UK sends twice as much money abroad as it received. However, remittances comprise a smaller share of UK’s GDP than in most other countries. UK’s share in overall remittances of countries could vary based on methodology chosen as there are multiple ways to measure the importance of remittances from the UK for the recipient countries. The Migratory Observatory mentions Kenya, Nigeria, Zimbabwe and Lithuania as the top 20 countries regardless of the measurement method chosen.

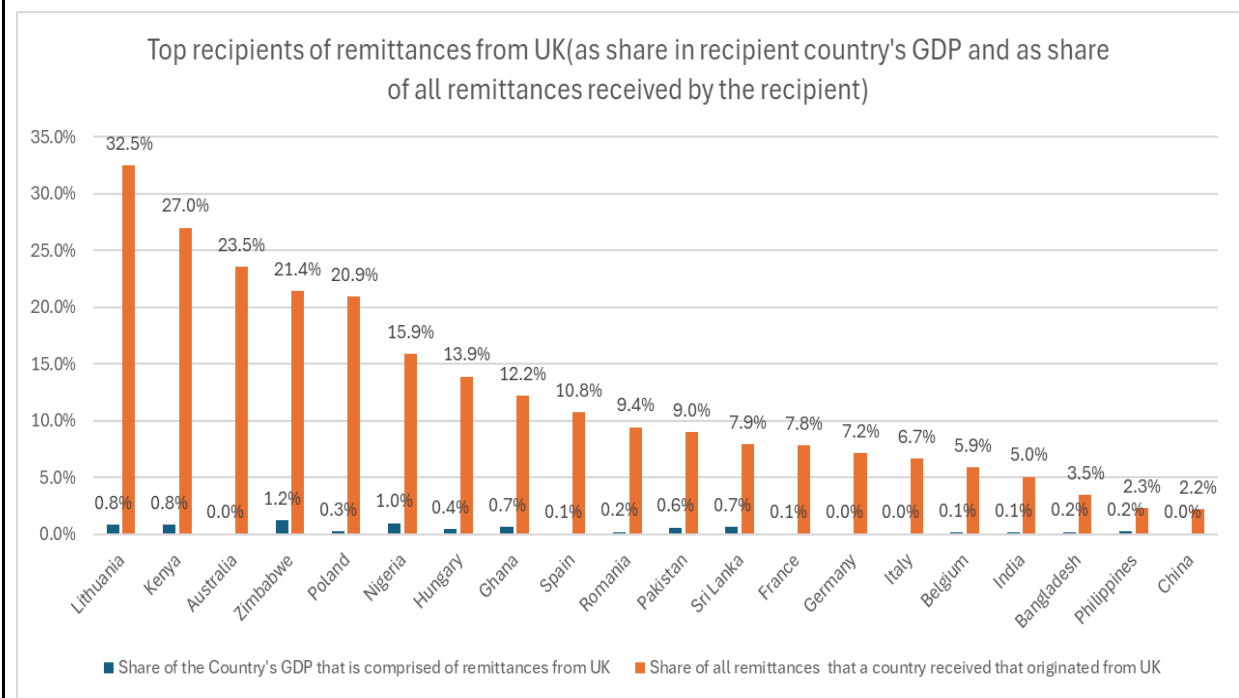
5.8 India received GBP 2,975 million pounds as remittances from the UK. The share of the remittances originating from the UK was 5% across all remittances that India received in 2018. This formed 0.15% of India’s GDP in 2018.

**Chart 5: Destinations of remittances from UK**



Source: Figure 2, The Migrant Observatory (2020).

**Chart 6: Countries receiving major share of their remittances from UK**



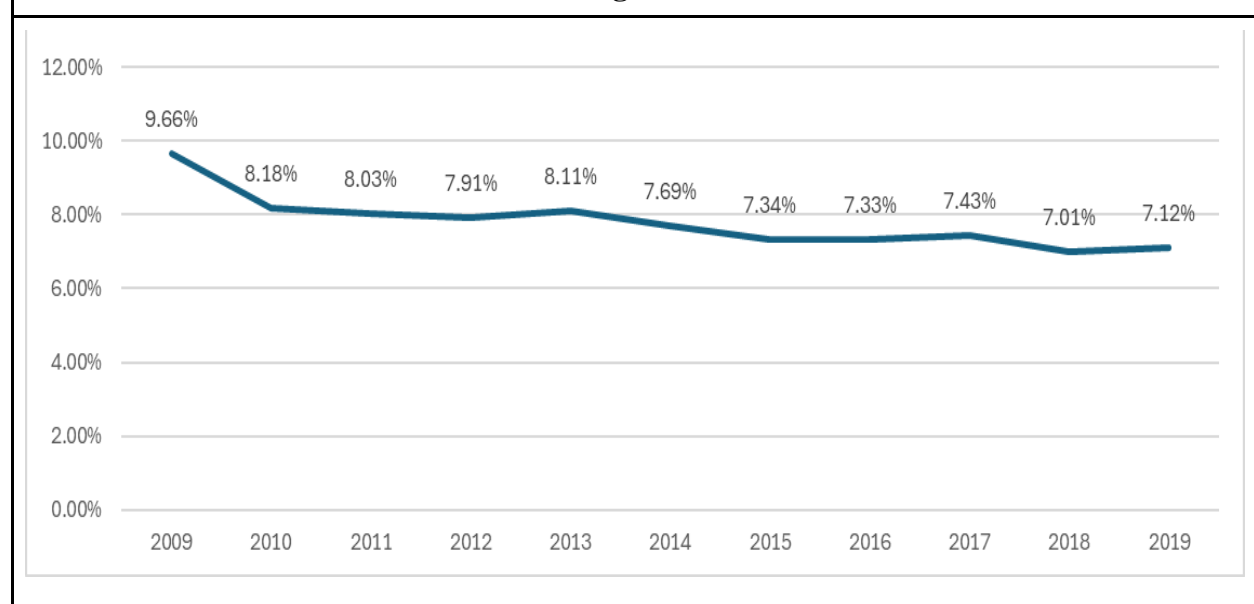
Source: The Migrant Observatory (2020).

## Cost of sending remittances from UK

5.9 A review of the channels used by migrants to send money from the UK to home reveals that the migrants chose both money transfer operators(MTO), family and friends and informal channels that do not get traced in the official government records. The cost of sending remittances from the UK would vary significantly depending on the destination as well as the transfer method used. The World Bank estimated in 2019 that the average cost of sending £120 from the UK abroad was roughly £8.5(*World Bank 2019d*).

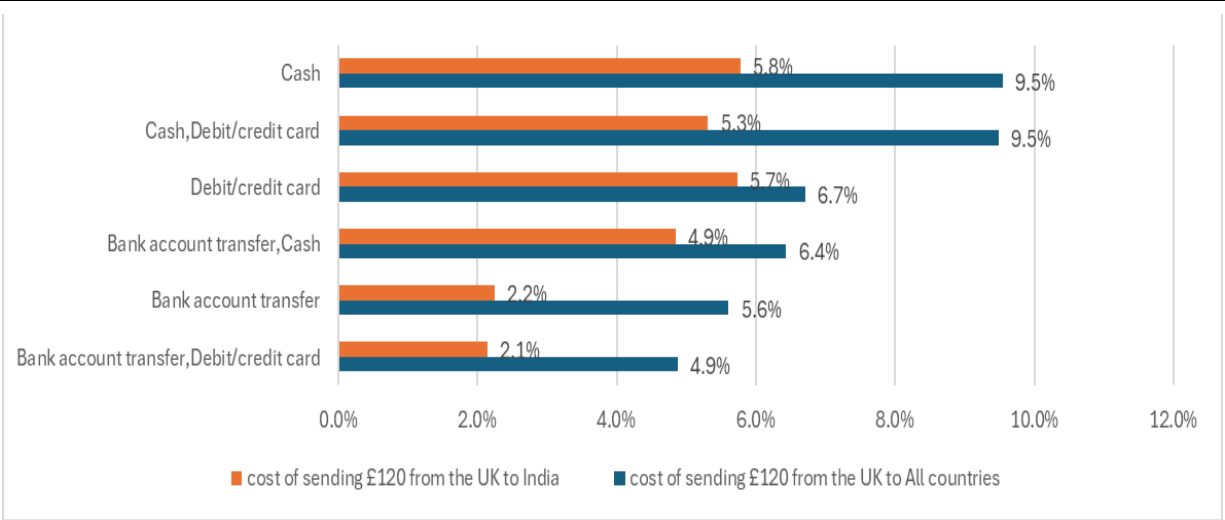
*Since 2009, the cost of sending remittances from the UK decreased by 2.5 percentage points, from 9.66% in 2009 to 7.12% in 2019. The current Sustainable Development Goal aims to reduce the cost of remittance transactions to 3% by 2030. The UK remains committed to helping reduce the global average cost of transferring remittances, as agreed by G20 leaders and under the Sustainable Development Goals target (SDG 10), and to achieving secure, transparent and accessible remittance corridors to developing countries.*

**Chart 7: Cost of sending remittances from the UK**



Source: The Migrant Observatory (2020).

**Chart 8: Cost of sending £120 from UK to all countries vis-à-vis India through various modes (Q4 2019)**



Source: Figure 4, The Migrant Observatory.  
<https://migrationobservatory.ox.ac.uk/resources/briefings/migrant-remittances-to-and-from-the-uk/>.

5.10 A comparison of costs across countries and transfer channels shows a *huge variation*. For example, sending £120 to Bangladesh using a money transfer operator (MTO) offering cash or debit/credit card payments could be almost free, possibly due to promotional offers, while sending the same amount to Lithuania in cash could cost as much as 24.88% (£29.86). Generally, *cash payments are more expensive than bank transfers*. The Migrant Observatory mentions that amongst all countries, India is the least costly destination where all transfer methods are below 6%.

### **Enhancing Cross-Border Remittances Between UK and India**

5.11 The past years have witnessed a transition away from traditional cash based remittance to digital platforms (mobile technology, fintech innovations, blockchain technology to name a few). Also the growth of the Indian community in the UK resulting in substantial remittance inflow in India (~ USD 111 billion in 2022), calls for greater collaboration between the two governments to ensure coordinated signals on the regulation side through collaborative policy so that the service providers innovate ways to reduce the cost transferring money. UK’s Financial Conduct Authority and the Reserve Bank of India, and the national governments, could further identify ways to control

the financial crimes, and encourage service providers to move away from a percentage based remittance fee, encourage entry of service providers and adopt a risk based approach to regulation. Poorer migrants could be provided with access to banking services, more banks to have access to operate in overseas regions, and encouraging remittance service providers to use other infrastructure like postal networks, mobile platforms to reduce the costs. Some of the key recommendations from the review of literature on reduction of remittances cost includes, harmonisation of regulatory requirements, financial literacy programs to educate the customers and service providers, explore and support fintech, block chain and crypto currency<sup>14</sup>.

5.12 The UK government's 2023 White Paper on International Development<sup>15</sup> commits the UK to enhance the development impact of these flows and to remittance systems. The UK focus for actions during the period 2023-2025 includes:

- Understand & seek to address the decline in correspondent banking relationships: Monitor the number of correspondent banking relationships nationally through IMF and World Bank published data, to understand which countries are most affected.
- Improve access to banking services for remittance service providers: Engage with the Money Service Business (MSB) sector, including those who are Money Transfer Operators (MTOs), and UK regulators to get a better understanding of the types of bank accounts (business, payment, safeguarding) which are face in securing these accounts.

5.13 Address money laundering risks in the remittances sector: The UK Government launched an MSB Strategic Action Plan in 2020, led by HM Revenue and Customs in partnership with HM Treasury, law enforcement authorities and other anti-money laundering supervisors to reduce money laundering in the MSB sector, including by MTOs. This plan aims to deliver enhanced supervision of MSBs, targeted enforcement activity against organized crime, better information

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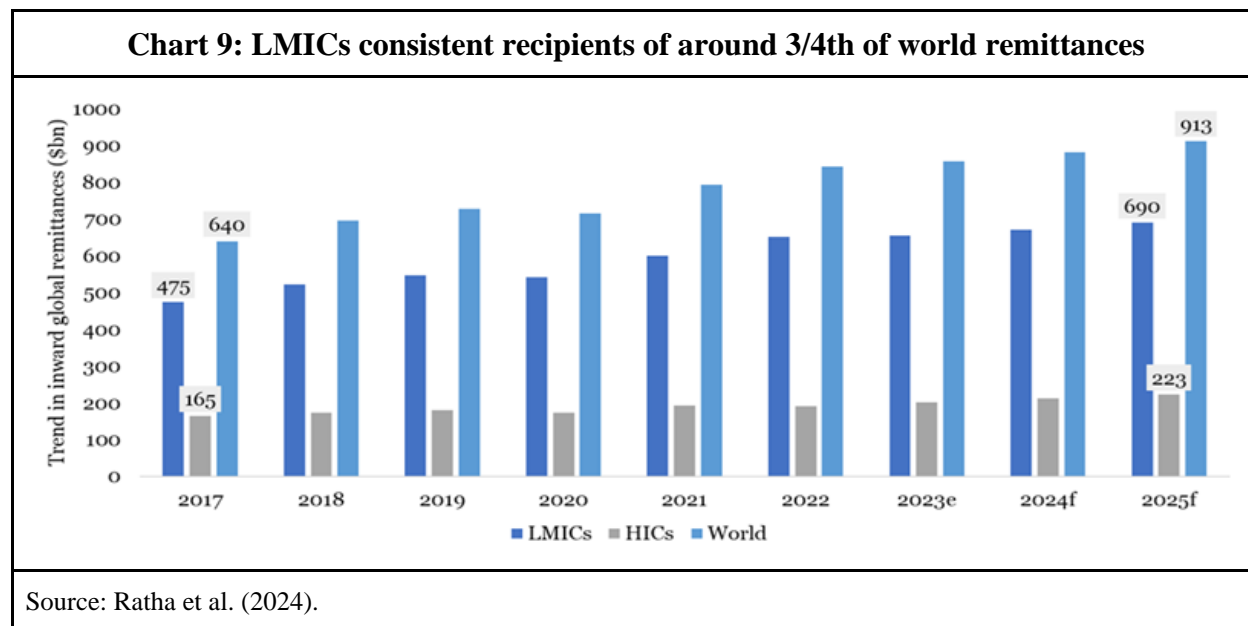
<sup>14</sup> Enhancing Cross-Border Remittances Between UK and India (Khan, Ahmed and Arun, Thankom and Murinde, Victor and Kostov, Philip and Markose, Sheri M. and Goel, Varnika and Sethi, Rashika and Mcgarrell, Rosemarie, Enhancing Cross-Border Remittances Between UK and India (September 26, 2024). Available at SSRN: <https://ssrn.com/abstract=4992933>).

<sup>15</sup> <https://www.gov.uk/government/publications/international-development-in-a-contested-world-ending-extreme-poverty-and-tackling-climate-change>.

sharing with the private sector to identify suspicious MSBs, better data on the sector and a better understanding of the economic benefits of MSBs.

### India perspective

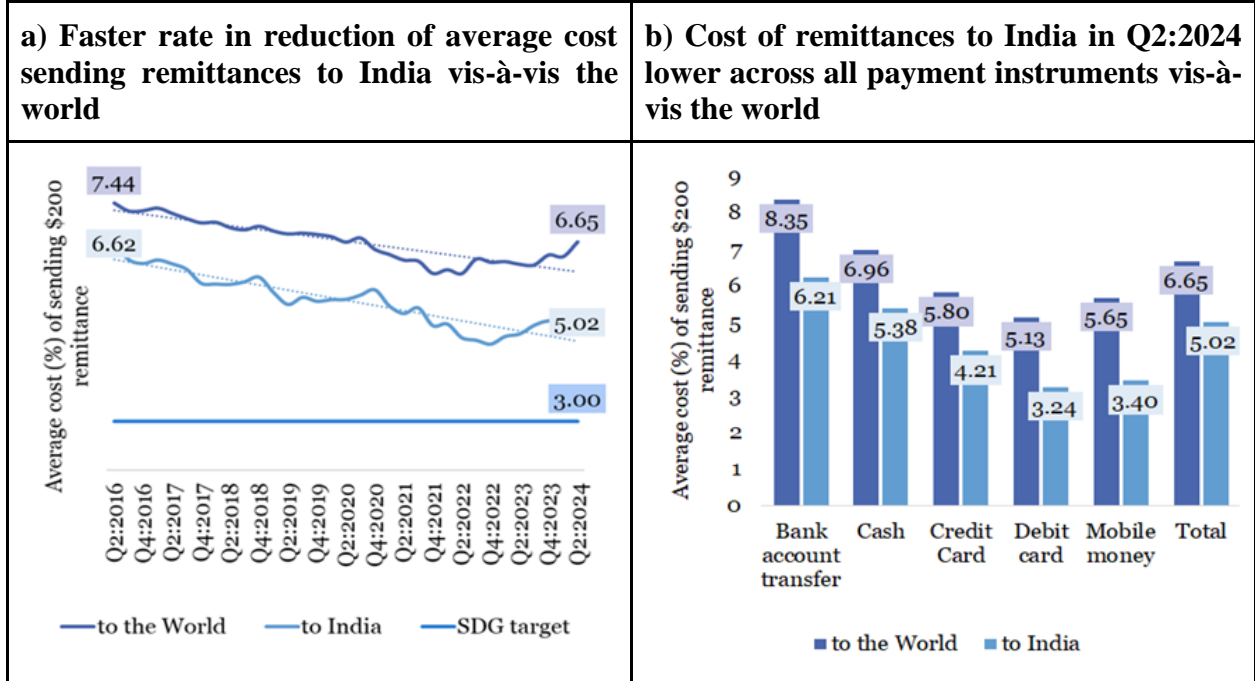
5.14 While India continues to be the largest recipient of remittances, the World Bank estimates remittance flows to low and middle income regions in 2023 accounting for around 76% of total remittance flows which signifies that the requirement to reduce the cost of remittances is significantly pertinent for low and middle income countries.



5.15 The World Bank estimates the global average cost of sending \$200 at 6.65 per cent in 2024Q2, a slight increase over the previous quarter and more than double the SDG target (The World Bank Group & FXC Intelligence, 2024). Amongst payment instruments, bank account transfer and cash were more expensive compared to debit card and mobile money and this was true in the case of remittances sent to India as well albeit at much lower levels.

5.16 Further, of the total cost, the global average cost for digital remittances, was lower than non-digital remittances across all regions. International Fund for Agricultural Development (2024) mentions that the absence of adequate digital infrastructure and local digital payment solutions, particularly in receiving markets forces recipients to cash out their digital payments, limiting the full potential of digital remittances.

**Chart 10: Price of inward remittances to India**

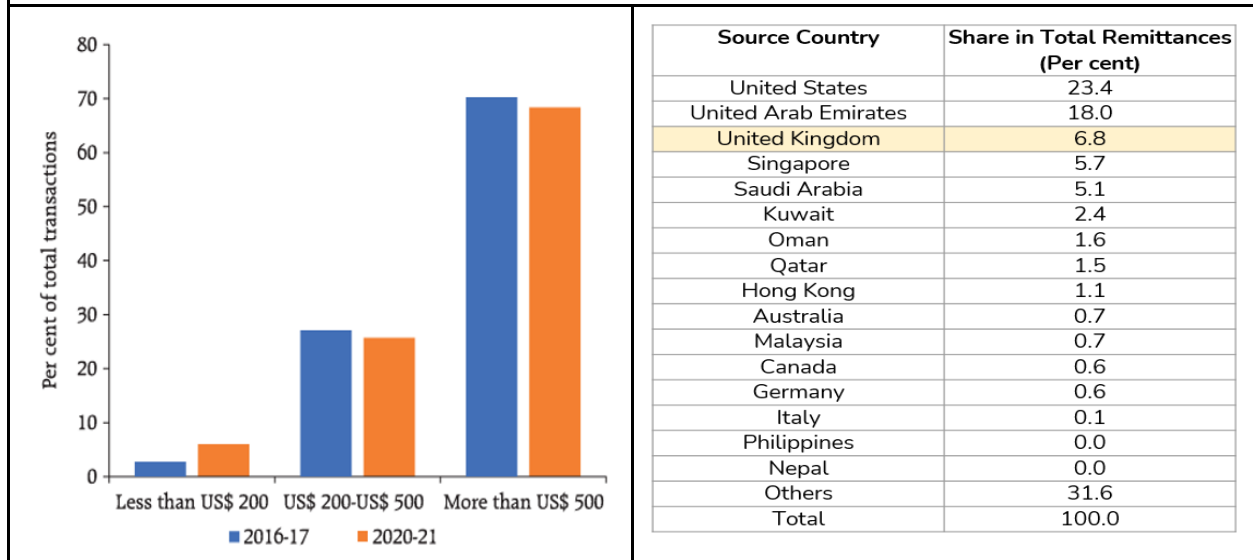


Source: The World Bank, Remittance Prices Worldwide, available at <http://remittanceprices.worldbank.org>.

5.17 Moreover, traditional private payment networks are segregated across multiple players and limits scalability due to market segmentation. Whereas DPI is accessible, interoperable with harmonized standards across all types and segments of payment service providers (Global Partnership for Financial Inclusion, 2023a) leading to market efficiency, promoting innovation, supporting scalability and pricing economically. This strongly makes a case to embrace greater financial inclusion in this area, with a greater imperative to DPI that would directly increase disposable incomes of remittance families.

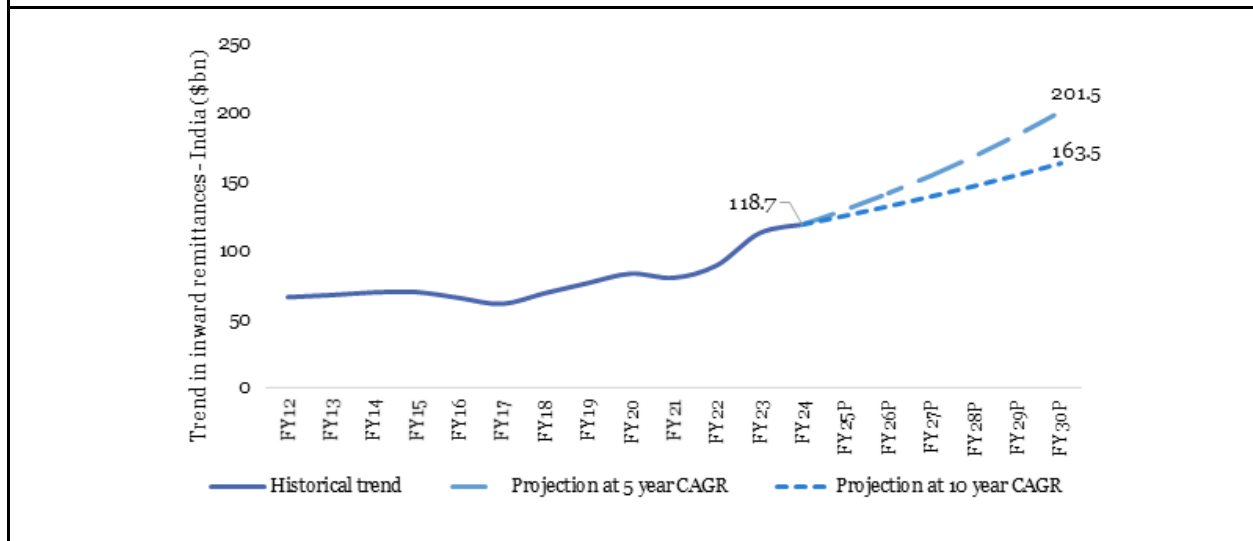
5.18 The UPI-PayNow (FPS of Singapore) linkage enables users of each of the two fast payment systems to make instant, low-cost fund transfers using their respective mobile apps, on a reciprocal basis without a need to get onboarded onto the other payment system. While fostering cross-border inter-operability of payments, this linkage will anchor trade, travel, and remittance flows between the two countries. Under this arrangement, the cost of remittances for ticket size of USD 200 (SGD equivalent) is as low as 1.42% for some banks (GPII, 2023b).

**Chart 11: India - composition of inward remittances**



Source: RBI remittances survey 2020-21.

**Chart 12: Trend in inward remittances for India**



Source: RBI for historical data and author’s estimates for projections.

5.19 The Reserve Bank of India (RBI) has been collaborating bilaterally with various countries to link India’s Fast Payments System (FPS) – the UPI, with their respective FPSs for cross-border Person to Person (P2P) and Person to Merchant (P2M) payments and signed an agreement on 30 June 2024 with BIS and the founding countries and became a special observer to project Nexus.

<b>Table 4: Potential cumulative savings in \$ Billion (FY25 to FY30) on reduction in transactions cost on projected remittances</b>			
Inward remittances - moderate growth scenario	for 25% transactions	for 50% transactions	for all transactions
by 1%	2.2	4.3	8.6
by 2%	4.3	8.6	17.2
by 3%	6.5	12.9	25.9
Inward remittances - high growth scenario	for 25% transactions	for 50% transactions	for all transactions
by 1%	2.5	4.9	9.8
by 2%	4.9	9.8	19.6
by 3%	7.4	14.7	29.4

Source: Author's estimates.  
Note: moderate growth and high growth scenarios are estimated at 10-year and 5-year CAGRs, respectively.

<b>Chart 13: Collaborations between UPI and FPS of other nations</b>	
UAE	<ul style="list-style-type: none"> <li>• NEOPAY (payment subsidiary of Mashreq Bank) – UPI at select merchant locations</li> <li>• Merchant locations of Network International LLC</li> </ul>
Singapore	<ul style="list-style-type: none"> <li>• Merchant locations of Network for electronic transfers (NETS) &amp; Liquid Group Pte Ltd.</li> <li>• UPI-PayNow linkage</li> </ul>
Bhutan	<ul style="list-style-type: none"> <li>• Royal Monetary Authority of Bhutan – UPI at select merchant locations</li> </ul>
Nepal	<ul style="list-style-type: none"> <li>• Fonepay Payment Service Ltd – UPI across various business stores</li> </ul>
Sri Lanka	<ul style="list-style-type: none"> <li>• LankaPay Private Ltd. – QR code based payments at merchant locations</li> </ul>
Mauritius	<ul style="list-style-type: none"> <li>• Bank of Mauritius – merchant payments via UPI in Mauritius and by IPS of Mauritius in India</li> </ul>
France	<ul style="list-style-type: none"> <li>• Lyra Group – Purchase tickets online to visit Eiffel Tower using UPI apps</li> </ul>

Source: NPCI International website.

## **The Central Bank Digital Currency (CBDC) dimension**

5.20 The 19th building block in the G20 cross border payments roadmap is, ‘Factor an international dimension into CBDC designs’. CBDC is digital equivalent of cash and is issued by RBI starting from ₹50 paise till ₹500 and guaranteed by Govt. of India. Individuals can hold ₹ in the CBDC wallets being provided by banks. ₹ has been made interoperable with UPI. This allows CBDC user to scan any UPI QR in the country and undertake a CBDC transaction.

5.21 The above developments underscore the nation’s commitment to strive to achieve the aforesaid SDG goal. Recent developments in global bilateral relations suggest that India may continue its current strategy, focusing on opportunities to leverage low-hanging fruits by targeting countries with the highest inward remittances and by UPI integration with these countries’ financial systems. Similarly, as the BIS, together with its innovative hub and central banks, advances key projects like mBridge, Mandala that test wholesale CBDCs for faster, more affordable cross-border transactions, it could also explore the potential of retail CBDCs in the future for safe, secure, and reduced cost of remittances.

## **6. Evidence from the demand side and DPI’s impact on behavioural change**

### **UK perspective**

6.1 The secondary evidence on customers/citizens' experience with digital services shows that UK citizens are mostly satisfied with the level of services provided to them. However, users expect more as the satisfaction with public services in the UK has dropped from 70% to 68% (Digital Review 2025). The government is working to the target of 78% satisfaction for great services. In the State of Digital Review published in Jan 2025<sup>16</sup>, it mentions that many public services still need to be fully digitised with deeper digital pathways. Additional public spending on technology, along with reforms in governance and control processes has been proposed to promote investment in digital solutions. The UK government acknowledges the need to further invest in digital technologies to further simplify citizens’ lives. The ambition to fully digitise public services would need greater investment and a holistic plan to avoid fragmentation of institutional structures.

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<sup>16</sup> <https://www.gov.uk/government/publications/state-of-digital-government-review/state-of-digital-government-review>.  
<https://www.instituteofcustomerservice.com/research-insight/ukcsi/>.

Creation of standardised integration frameworks will enable institutions to avoid duplication and fragmented digital solutions. UK policies need to fully align with digital solutions and create a culture that promotes digitised delivery of public services.

### **India perspective**

6.2 The role of DPI in accelerating financial inclusion has been unprecedented. D'Silva et al. (2019) state that India's approach rests on the principle of providing digital financial infrastructure as a public good and estimated that it would have taken 47 years to achieve 80% of adults with a bank account had India solely relied on traditional growth processes. The speed of adoption of aadhar, Jan Dhan Yojana initiative and DBT led to sharp increase in bank accounts accompanied with a sharp reduction in exclusion of marginalised groups. Aadhar also dramatically reduced e-KYC compliance costs. Deepening mobile connectivity and significant reduction in cost of mobile data consumption have facilitated adoption of DPI by the citizens at large.

6.3 D'Silva et al. (2019) also note that account aggregators in financial services have the same intended outcome as "open banking"; however, it is not limited to banking activities alone since it encompasses all regulated entities under the RBI, SEBI, IRDA and PFRDA, and could therefore promote banking, insurance and investment activities, thus ushering in open finance. They also identify potential use cases in the healthcare segment and labour markets. Notably, AAs facilitate access to unserved and underserved segments and democratize innovation by new players hitherto limited due to data being siloed by incumbents. Total cumulative loans disbursed until March 2024 is around USD 5 billion. Cumulative consent-based data sharing transactions stood at around 115 million as of September 2024.

6.4 The UPI has been a game-changer by boosting efficiency and convenience in the payments ecosystem, underscoring India's commitment in leveraging technology for inclusive growth and economic progress. UPI has had a profound impact on small businesses, street vendors, and migrant workers, offering them an easy and efficient way to transfer money and receive payments. Its adoption was particularly accelerated during the Covid-19 pandemic, as people sought safer, contactless alternatives to cash transactions. Further, users are free to choose their preferred payment apps, regardless of the bank where their account is held, which has contributed to ease of use and popularity of this means of payment.

## **7. Key insights on India-UK collaboration**

**Based on a wider engagement with stakeholders on both sides, our recommendation is on the following policy areas:**

### **Cross Border payments**

7.1 The UPI system has the potential to evolve into a cheaper and quicker alternative to the available channels of cross-border remittances. A beginning can be made with small value personal remittances as it can be quickly implemented<sup>17</sup>. The bilateral payments roundtable is a product of India UK Economic Financial Dialogue. Discussions are ongoing to explore synergies in the payments space. A strong case emerges for a bilateral payments corridor that is win-win for both the UK and Indian economy. NPCI International Payments Ltd. is exploring collaboration with Pay.UK and other stakeholders. Once operational, such a bilateral payments mechanism could also facilitate settlement of bilateral trade in goods and services. Bilateral services trade alone accounted for \$29bn in 2023 with travel and ‘other business services’ accounting for 80% share. This reflects the strong presence and greater scope of tourism and financial services between the two economies that can be further leveraged with DPI.

7.2 Leadership on regulatory aspects of fintech innovation to solve the threats that could arise from cybersecurity developments where global coordination is required to invest into the safety nets in a digital world order.

### **Other areas of collaboration**

7.3 Scaling up the investment required to equip digitally native countries to choose and implement the relevant subset of DPI stack that meets their specific development goals.

7.4 Build on the existing collaboration with the Alan Turing Institute in UK and MOSIP, India.

## **8. Conclusion**

This joint paper on DPI concludes that there are areas of collaboration that both the Indian and the UK government could explore in coming times. The DPI architecture for digital identity, payments and data exchanges, is very advanced in India as well as in the UK compared to many countries.

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<sup>17</sup><https://www.bis.org/review/r240828p.pdf>.

However, both nations continue to work in establishing regulatory frameworks and resilient infrastructure that serves the customers and businesses well. Both nations could work in collaboration to equip many digitally native countries to adapt to interoperable digital systems. They could further build and invest in multilateral efforts and projects in areas like cybersecurity, cross border payments corridor and share their expertise with global communities.

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