December 2024

Unpacking User Centricity Through the Payments Layer of Digital Public Infrastructure

AUTHORS | David Porteous, Jayshree Venkatesan, and Alexandra Rizzi

ACKNOWLEDGEMENTS

A version of this paper was originally presented at the Responsible Finance Forum 2024 in Fortaleza, Brazil, alongside the G20 GPFI meetings. The authors would like to express their gratitude to Edoardo Totolo and Nataša Goronja for their valuable input, guidance, and recommendations in refining this paper. The research and publication of this paper were made possible by the funding support of the Mastercard Center for Inclusive Growth. Special thanks are extended to Payal Dalal, Heba Shams, Anand Raghuraman, Trisha Tan, and Leslie Meek-Wohl for their contributions. Lastly, the authors would like to acknowledge the time and insights generously provided by the many individuals interviewed, whose perspectives form the foundation of this paper.

Contents

01 Introduction

User centricity is an approach that puts users' needs, experiences, and objectives at the core of designing a product or service. In the private sector, it is a prized attribute of successful digital products and services, but it is also increasingly recognized as important in the design of public services. **How might user centricity apply to digital public infrastructure (DPI)?** DPI straddles both public and private sectors: On the one hand, like a private digital service, uptake depends on how useful, trusted, and easy to use a system is; on the other, like a public utility service, DPI is usually intended to serve most, if not all, in a jurisdiction rather than targeted segments. In the words of the G20 New Delhi Leaders' Declaration, [1] DPI is intended "to deliver equitable access to public and/or private services at a societal scale."

To apply the concept of user centricity to infrastructure requires clarification because it is not always clear who the main user is. Using an example from physical infrastructure, passengers don't themselves travel on train tracks but instead rely on railway companies to transport them on the rails. Even though the passenger experience may be strongly shaped by the railway company, the rail infrastructure will also have a substantial effect — for example, on where they can get to and how safe the route is. These factors may determine whether they use the railway at all, or how often. Similarly, DPI in the financial sector often has a multi-tiered nature, where the direct user is a financial service provider that uses the "rails," so to speak, to deliver services to the end consumers who are its indirect users.

1 G20 New Delhi Leaders. (2023, September 9–10). G20 New Delhi Leaders' Declaration. G20, New Delhi, India. https://www.mea.gov.in/Images/CPV/G20-New-Delhi-Leaders-Declaration.pdf

This brief aims to frame user centricity in the context of DPI by first considering how existing approaches to user centricity from both the public and private sector apply and then why it matters for digital infrastructure. Then, we seek to learn from the extent to which user centricity has been applied so far in practice in the DPI category of instant payment systems. Based on published material and interviews with system managers, participants, and researchers, we look specifically at UPI in India, launched in 2016, and PIX, which was launched in Brazil in 2020. UPI and PIX are among the most often referenced examples of DPI because of the scale of their adoption. Uptake alone does not establish user centricity, especially if there is limited choice or other incentives for usage. However, considering some of the practices of these large and growing payment systems provides initial pointers towards the more general research of developing an actionable user-centric approach to DPI. We close the brief with some considerations about how to understand and support user centricity in DPIs.

02 Defining User Centricity in the Context of DPI [2]

User centricity originated in the private sector as a design approach that aims to make a digital product or service more appealing to a target user. In the realm of digital products and services, there is a strong emphasis on improving the user experience (UX) through optimizing user interfaces (UIs) through an iterative process of interactive improvement. CGAP has extended a user-centric lens to financial service providers in general, arguing that this approach is important especially for adoption by and retention of low-income customers.[3]

However, there is as yet no clear definition of what constitutes user centricity for DPI. But in this section, we clarify first how the concept applies to infrastructure, and then infer some key principles from four relevant frameworks that help to shape a general understanding.

The first challenge with DPI is to define the relevant user. Most forms of DPI in the financial sector work on a multi-tier basis with:

- → **Participants** in payments or open finance systems that are usually regulated financial providers, who are the direct users of the system and
- → **End users,** who are clients of the participants.

2 We acknowledge the work of Smriti Parsheera, who discussed how OECD principles apply to India Stack in general: Parsheera, S. (2024). Stack is the New Black?: Evolution and Outcomes of the 'India-Stackification Process. Computer Law & Security Review, (52). https://www.sciencedirect.com/science/article/abs/pii/S0267364924000141; and Anir Chowdhury, who presented on a user-centric approach to DPI based on Bangladesh's experience at a World Bank event in 2023: Chowdhury, A. (2023, September 12). Building User-Centric DPI: Practical Tools. World Bank DPI Workshop. https://thedocs.worldbank.org/en/doc/a58b3623dc3a3a79339fd6f5718350425-0050112023/original/5-DPI-Workshop-User-Centric-DPI-Bangladesh.pdf

3 CGAP. (n.d.). Customer-Centric Guide. https://customersguide.cgap.org/

End users benefit from the system, but they may even be unaware that they are using one as they see and experience their provider's app as the main interface for making a payment, not necessarily the payment system which enables it. Similarly, with open finance systems, end users may receive a request to authorize a third party's access to their data without any sense that, behind it, there are standardized APIs or system rules which are binding on the participants.

The duality of DPI means that both levels of user must be considered; if a DPI system does not work for its participants, even if their participation is mandated by a regulator, they will have little incentive to drive uptake, at least beyond an initial period of scrutiny. This suggests that participation itself should be driven with end user outreach and relevance in mind. Equally, if the system is designed without the needs of the end user in mind, it is unlikely to attract much usage. So, user centricity for a financial DPI has to balance two considerations:

- A DPI must be designed and operated with the interests of its participants in mind — to distinguish it, let's call this **participant centrality**; and
- A DPI must also take into account the needs of end users; let's reserve the term **user centrality** for this level, understanding that users are not homogeneous in interests or needs.[4]

These two may come into conflict — for example, over the issue of pricing. A participant may wish to maximize revenue by charging high fees, while an end user may wish to minimize fees. One of the ways DPIs resolve this tension is either by allowing participants to set customer fees, allowing for competition and choice to resolve the pricing model, but with the risk of end user confusion, or by taking away the ability to charge end user fees altogether, with the risk of dampening participation.

Part of the tension comes from the fact that introducing a DPI has differential effects on the business models of different participants; it may favor new entrants, for example, at the cost of incumbents. A key role of system governance is to resolve these tensions in ways that contribute to the highest usage over time. Simple indicators of **participant centricity** could therefore include:

- Whether the number and variety of participants is growing over time, beyond the ranks of any that are required to participate in the system;
- Then, at the next level, whether the volume of transactions initiated from each participant is also growing over time as a measure of the intensity of usage; and
- How participants' voices are heard in system governance.

Beyond this simple level, more complex analysis of participant centricity would require understanding of the business models of different participants and how these align (or not) with the achievement of a system's goals.

Moving to the end user level, we can infer at least the basic characteristics of user centricity for payment systems from the overlap of different sets of existing principles. For this, we considered the following principles of UX design for digital services: the Organization for Economic Co-operation and Development(OECD) principles for public service design, the UN Principles for Responsible Digital Payments, and the Environmental, Social, and Governance (ESG) approach embodied in the IFC Environmental and Social Management System (ESMS) Handbook.

Each set addresses a different core issue:

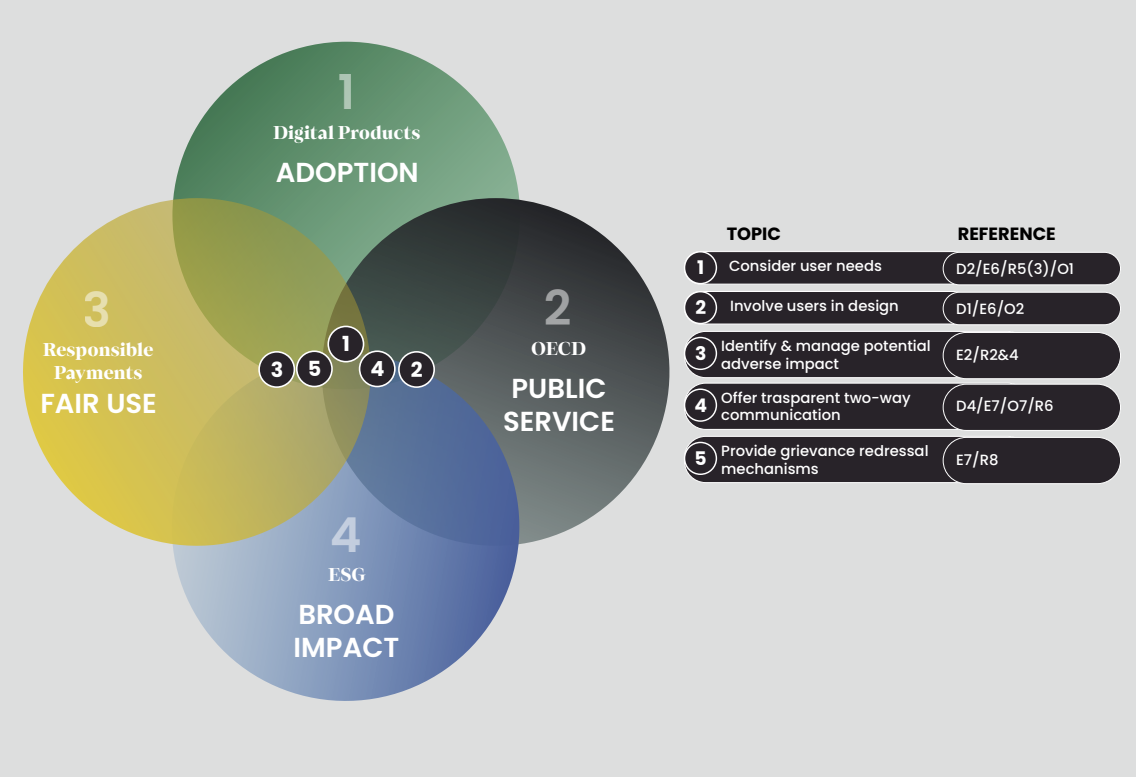
- For UX design, the aim is usually maximizing adoption.

4 For example, the traditional distinction is between consumers and merchants on different ends of a purchase transaction.

- → The OECD principles define quality digital interactions with the public sector.
- → The Principles for Responsible Digital Payments focus on the risks attached to digital payments.
- → The IFC's ESG approach is concerned with identifying and mitigating the risks of financing projects that may have adverse societal or environmental effects.

Although there are different foci across each of these sets (adoption is the focus of a private sector UX approach, whereas risk is at the heart of concerns for responsible digital payments, for example) and they apply to different domains (private or public services, respectively), there is, in fact, considerable convergence among them. Figure 1 identifies five areas of overlap, which are described in the box alongside. These can help define an initial principle-based understanding of user centricity in the DPI context.

FIGURE 1: THE FOUR SETS OF PRINCIPLES THAT DEFINE USER CENTRICITY FOR DPI



Note: References are to specific principles in the sets, which can be found in the Annex.

The five topic areas listed above are stated quite generally, as they are in the principles from which they are derived — for example, the first: "Consider user needs." They consequently require further clarity to become actionable. Table 1 below takes the next step by adding further definition in the context of DPI and proposing in the right-hand column some potential indicators for each. An important distinction is between areas in which the DPI itself, represented by the system manager or operator, must take direct responsibility versus those areas in which the system manager holds participants accountable.

TABLE 1: COMMON PRINCIPLES AND EXAMPLES OF POTENTIAL INDICATORS FOR DPI USER CENTRICITY

PRINCIPLES	EXAMPLES OF POTENTIAL INDICATORS APPLIED TO DPI
1. Consider user needs: The DPI itself has a clear view on who its target and actual end users are and what their needs are.	1. The DPI has defined target user segments and has collected data to understand their needs along the user journey and target use cases. 2. The interfaces are available in languages that the target user understands.
2. Involve the user in design: The voices of end users are sought upfront and over time.	1. End users were explicitly consulted during the design of the DPI. 2. The DPI itself has an ongoing process to survey end users periodically on their needs and on app interfaces.
3. Identify risks and manage potential adverse impact: The DPI assesses any potential adverse effects on stakeholders and seeks to mitigate them.	1. The DPI explicitly considers risks to end users in its own risk assessments. 2. When new risks are identified, the DPI acts promptly to mitigate them.
4. Offer transparent two-way communication: There are independent mechanisms to assess users' views of the DPI.	1. Participants regularly collect user feedback and report it to the DPI. 2. The DPI publishes systems data relevant to stakeholders (including usage, segments, and grievances) on a regular basis.
5. Grievance management: The DPI has effective means for redressal.	1. Participants track complaints from users and report to the DPI. 2. The DPI requires at least that participants operate clear, fair, and accessible redressal mechanisms that address problems experienced by users. 3. There is clarity on who bears responsibility of grievance redressal at all layers of DPI and across all use cases.

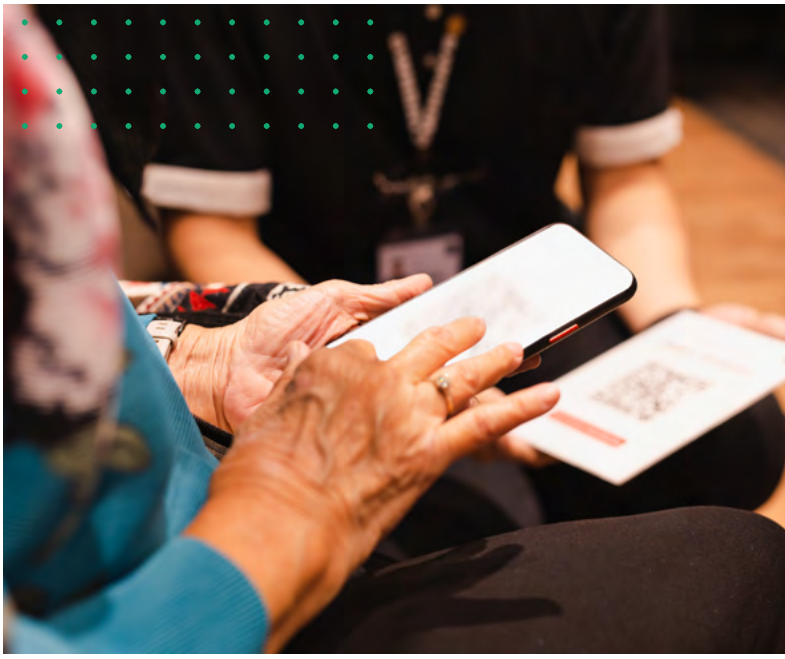
03 Why Does User Centricity Matter for Infrastructure Operators?

Although there is convergence of these existing principles in ways that can shape an application to digital infrastructure, why would, or should, an infrastructure provider care about user centricity? We see two main reasons.

First, the economics of DPI systems depend on scale usage. DPIs usually have relatively high upfront fixed costs but charge low fees to encourage usage. They therefore must process large volumes in relatively short timeframes to sustain them. User-centric design is more likely to lead to higher adoption and usage over time than a counterfactual that does not consider user needs. However, the reverse may not be true; simply because a system has high usage does not necessarily make it user-centric. High usage could also result from a lack of alternatives or even from compulsory use for certain types of transaction, for example, government payments.

Disentangling causality between user centricity and adoption is not simple, but researchers are starting to test the correlation at least. In a 2024 econometric study, [5] a group of BIS (Bank for International Settlements) researchers investigated whether user-centric features in 13 instant payment systems around the world (including the Unified Payments Interface (UPI) in India and PIX in Brazil) positively influenced their subsequent usage. To proxy for user centricity, they used a set of indicators that reflected observable outcomes of system design: the number of use cases served, whether aliases were allowed for addressing, whether or not there was cross-border functionality, and whether they had Application Programming Interfaces

5 Frost, J., Koo Wilkens, P., Kosse, A., Shreeti, V., & Velasquez, C. (2024). Fast Payments: design and adoption. BIS Quarterly Review. https://www.bis.org/publ/qtrpdf/r_qt2403c.htm



(APIs) and standardized interfaces.

Note that while observable features like these may be proxies, they are not necessarily user-centric unless grounded in evidence that they, in fact, meet target users' needs. For example, it may be easy to accept that allowing payment aliases is likely user-centric (compared with previous approaches to payment addressing), but making or receiving cross-border payments may or may not be important for most target users in a specific country. Nonetheless, the BIS study found statistically significant correlation between the number of use cases and cross-border connections and subsequent usage, indicating the importance of network effects with payments. [6] Even if the measurement of user centricity can be improved, this finding at least encourages the belief that greater user centricity is likely to lead to greater scale. However, this still leaves the question of who is primarily responsible for user centricity — the operator of the infrastructure or the users of that infrastructure, namely, the participating payment providers in the case of payment systems. There may not be a single answer to this question, and further research is needed to analyze the pros and cons; what is, however, clear is that the responsibility for user-centricity should not slip between the cracks.

A second reason why DPIs should care about user centricity is because their stakeholders increasingly expect it. As public systems, DPIs have a society-wide set of stakeholders, including their end users and their funders. Donor funders, for example, expect DPIs to achieve widespread usage, and often regard user centricity as important in achieving this end. In some specific sectors like digital finance, expectations have been further clarified; the UN Principles for Responsible Digital Payments, endorsed by a range of international agencies, sets out how providers should behave to be considered responsible and to maintain trust. [7] These Principles add the elements of fair treatment and recourse to an understanding of user centricity.

Even though user centricity originated in the private sector, it has been increasingly applied to and by the public sector. This is relevant because DPIs function most as utility-like services, straddling both the private and public sectors. In 2011, the Scottish government published its approach to public service design, describing design "as a way of exploring the problem space openly, collaboratively and with users, before a solution or service is decided." [8] The UK Government Central Digital and Data Office has also published a list of Design Principles, headed by "Start with user needs." [9] The OECD's 2022 guidance note entitled Good Practice Principles for Public Service Design and Delivery in the Digital Age, built on member country experiences provides advisory rather than prescriptive principles and allows for local interpretation and

6 They also find that the admission of non-bank PSPs and public ownership were significant for uptake, but infrastructure is not.
7 Better than Cash Alliance. (2021). UN Principles for Responsible Digital Payments. https://www.responsiblepayments.org/
8 Director General-Corporate. (2019). The Scottish Approach to Service Design (SatSD). Digital Directorate Scotland. https://www.gov.scot/publications/the-scottish-approach-to-service-design/pages/foreward/
9 Central Digital and Data Office, UK. (2019). Government Design Principles. https://www.gov.uk/guidance/government-design-principles

implementation. [10] While the scope of this list of good practices goes beyond user centricity only to also include the public capacity to deliver, which is likely a significant factor in non-OECD countries, it nonetheless starts by affirming the need to "understand users and their needs." It follows this first principle with a second: "Make the design and delivery of public services a participatory and inclusive process."

Finally, in terms of defining stakeholder expectations, the **ESG movement** urges firms, including financial providers, to consider how they affect and are affected by the environment and by the society in which they operate. In some jurisdictions like the EU, this assessment is now required by law. The definition of "society" in ESG includes consumers or users among the wider set of stakeholders who explicitly need to be identified. Where there is a risk of potential adverse impact, there are heightened requirements for communication and risk management. ESG concerns apply especially when considering the impact of new physical infrastructure. Multilateral financiers, led by the IFC, have developed principles of environmental and social management to codify their own approach to addressing this for investments and have encouraged private financiers to follow with the major projects they finance through the Equator Principles. The IFC's ESMS Handbook (2015) sets out nine areas that are required to be covered in an effective environment and social management system, including stakeholder engagement and for grievance management. [11] Though the IFC approach was designed with physical infrastructure in mind, some of the areas, notably the requirement to assess potential risks on users and have effective grievance redressal, also remain relevant for digital infrastructure. The UNDP initiative to define universal safeguards for DPI [12] represents an effort to translate societal concerns about safety and equity into the realm of DPI. [13]

The UNDP initiative to define universal safeguards for DPI represents an effort to translate societal concerns about safety and equity into the realm of DPI.

10 OECD. (2022). OECD Good Practice Principles for Public Service Design and Delivery in the Digital Age. OECD Public Governance Policy Papers, No. 25. https://doi.org/10.1787/2ade500b-en

11 IFC. (2015). Environmental and Social Management System (ESMS) Implementation Handbook. https://www.ifc.org/en/insights-reports/2015/publications-handbook-esms-general

12 Digital Public Infrastructure Universal Safeguards Working Group. (n.d.). Universal DPI Safeguards Framework. UN Office of the Secretary-General's Envoy on Technology. https://www.dpi-safeguards.org/

13 Digital Public Infrastructure Universal Safeguards Working Group. (2024). Leveraging DPI for Safe and Inclusive Societies: Interim Report. UN Office of the Secretary-General's Envoy on Technology. https://safedpi.gitbook.io/safeguards/about-the-universal-dpi-safeguards-initiative/key-outputs/interim-report-leveraging-dpi-for-safe-and-inclusive-societies

04 How Do Payments DPIs in Brazil and India Measure Up?

We chose the instant payments systems from India i.e. Unified Payments Interface (UPI) and Brazil i.e. PIX for further analysis for two reasons.

First, they have already achieved substantial scale. UPI and PIX are already among the largest instant payment systems in the world by volume, eight and four years after launch, respectively. Around half the adult population of Brazil has registered a UPI payment alias, and in India, 260 million people (over a quarter of the adult population) are estimated to use UPI. [14] Measured in terms of monthly transactions per capita, these two systems rank second and sixth, respectively, among the global instant payments systems considered in the BIS study. [15] As already mentioned, scale alone does not infer user centricity, but it does mean that these systems are having a large effect on shaping perceptions of instant payments in their markets.

Second, despite different structural features and contexts, their core set of features is similar (Table 2). This is not surprising because they have learned from one another; as the first mover in this cohort of instant payments systems, the experience of UPI informed the design of PIX. [16] Their success has influenced the design of the next wave of systems, such as South Africa's PayShap, which was launched in 2023. They have been described individually in more detail in numerous case studies and articles. [17]

14 Raythore, M. (2023). UPI in India – statistics and facts. Statista. https://www.statista.com/topics/11520/upi-in-india/#topicOverview

15 See Graph 1A in Frost et al. (2024).

16 These two have also been influential in the design of subsequent programs such as South Africa's PayShap, launched in 2023.

17 For example, on UPI: World Bank. (2021). World Bank Fast Payments Toolkit Case Study: India. https://fastpayments.worldbank.org/sites/default/files/2021-10/World_Bank_FPS_India_IMPS_and_UPI_Case_Study.pdf

TABLE 2: PROGRAM CONTEXT

		
Country	Brazil	India
Launched	2020	2016
FEATURES		
Availability	24/7	24/7
Use cases covered	P2P, P2M, RTP, standardized QR	P2P, P2M, RTP, standardized QR
Common brand	Yes	Yes
Use of aliases	Yes	Yes
End user pricing	Controlled — free to individual; merchants pay set fee	Controlled — free to individual; larger merchants may need to pay eventually; interchange fee of up to 1.1 percent on prepaid instrument (PPI) based transactions through UPI (borne by PPI issuer) [18]
Standardized QR code in use	Yes	Yes
Transaction size cap	Yes	Yes
STRUCTURE		
Owned and operated by	Banco Central do Brasil	Bank-owned utility NPCI
Direct participants [19]	Banks & regulated providers	Banks
Governance of program	BCB Advisory body: PIX Forum of members and civil society	UPI and Services Steering Committee [20] (20 banks)
PERFORMANCE		
Number of transactions	5.7 billion transactions (for October 2024) [21]	16.5 billion transactions (for October 2024) [22]
Number of individual users	Estimated to be over 365 million by the end of 2024 [23]	154.8 million (as of October 2024) [24]

18 Large merchants may have to pay reasonable fee on UPI payments: NPCI chief | Economy & Policy News - Business Standard
19 Note that we use the term "participants" going forward to refer to the set of institutions that participate in the delivery of financial services using digital public infrastructure.
20 Note that the payment regulator also has a seat on the NPCI board.
21 Pix Statistics
22 Unified Payments Interface (UPI) Product Statistics | NPCI
23 Note that NPCI does not publish number of individual users; however, market estimates suggest this number. UPI Statistics 2024 (Number of Transactions & Usage)
24 See DICT users, individual: Pix Statistics

Based on interviews with systems operators, participants, and researchers in each country, we can now consider how these systems have approached user centricity.

At the level of participant centricity, both systems satisfy at least some of the basic indicators proposed earlier (Table 3). At the level of participants, they have attracted growing numbers beyond those that, in the case of PIX, were mandated to become members at the outset. They also both have mechanisms whereby participant voices can be heard in different ways. In the case of PIX, where participants do not directly own or operate the systems, the PIX Forum, an advisory body, also includes associations representing end users.[25] However, beyond these basic indicators, the issue is less clear in terms of the overall business case for participants to promote usage. By limiting the ability to charge fees, UPI has so far benefited most those tech players with an adjacent business case, like Google Pay or PhonePe, rather than banks or fintechs that rely on earning transaction fees. By allowing a small but non-zero merchant fee (0.33% of value), PIX has so far avoided most of the controversy about fee charging.

TABLE 3: INDICATORS OF PARTICIPANT CENTRICITY [26,27]

		PIX	UPI
	VOLUNTARY/ COMPULSORY MEMBERSHIP	**COMPULSORY ONLY FOR LARGE BANKS**	**VOLUNTARY**
1.	Is there a growing number of participants?	Yes — 825 (April 2024) (742 at launch in 2020)	Yes — 581 (Just over 100 in 2018)
2.	Participant voice in systems governance	Yes — on PIX Forum (advisory)	Yes — via NPCI UPI & Services Steering Committee,[26] which has 20 members
3.	Ability to charge fees to end users	Fees on (Person to Merchant) P2M only set by system	Fees on certain (Person to Merchant) P2M only, [27] set by system

There is insufficient evidence yet to conclude how well these two systems meet all the suggested indicators of user centricity. However, Table 4 below summarizes evidence available in two aspects of user centricity proposed in the previous section. Both systems regularly publish aggregated data on usage, with some disaggregation by type of transaction, payment provider, and even location, in the case of PIX. For PIX but not UPI, the number of individual users is reported. Interestingly, however, as a transparency measure, NPCI also publishes the minutes of the UPI and Services Steering Committee, which meets to consider product changes and promotions. PIX also publishes a monthly service quality index for each participant comprising

25 Luciano, M. (2024). The PIX Forum: Lessons for DPI Governance. LinkedIn.
26 NPCI. (n.d.-a). UPI & Services Steering Committee. https://www.npci.org.in/what-we-do/upi/steering-committee
27 Since April 2023, defined categories of merchants using prepaid wallets to receive payments must pay an interchange fee of 1.1% on transactions above INR2000/USD $24, a threshold well above the average ticket size.

components tracking availability, uptime, complaints received, and resolution rates.[28] These each relate to end user needs and expectations. Publishing this data informs customer choice and can incentivize providers towards user-centric performance. Both systems also have well-defined grievance redressal mechanisms. UPI requires that access to its online dispute resolution is built into providers' apps for user convenience.

TABLE 4: INDICATORS OF USER CENTRICITY [29] [30] [31] [32] [33]

	PIX	UPI
Public communications What level of data is disclosed to the public and how frequently?	Monthly aggregated data from BCB via PIX Portal [29]	Monthly aggregated data is released on usage by NPCI [30]
Grievance redressal Does the system provide a way to log grievances/complaints?	Disputes have to be managed according to the PIX rule book. End users can directly complain to the central bank. Grievances are taken into account in the PIX Quality of service index [31] (IQS) published for each provider. [32]	All participants are required to implement online dispute resolution processes on their apps. However, recent research has found mixed visibility, accessibility, and availability of the grievance redressal process. [33]

Beyond these two areas, national level systems like these target multiple user types that may have differing needs, which are also likely to change over time. To track this, both systems rely mainly on feedback from participants about end user needs. However, PIX also undertook its own surveys of target users before launch, which it intends to update on a biannual basis as a way of maintaining a direct view of the end user market. This requires cost and effort alongside the growing functions provided by the systems.

Both systems have active product roadmaps setting out their plans to roll out additional features and address the needs of additional user segments. They both initially targeted smartphone users who could access payment apps. In Brazil, this covered most target users, but in India, an estimated 400 million people had only feature phones and lacked consistent internet access. To extend convenient access to this segment also, UPI launched UPI123Pay in 2022, which allows for IVR onboarding and proximity sound-based payments at merchants. The ability to track usage patterns across different segments of the population over time is important.

The operators of these systems both acknowledge the importance of understanding and addressing user

28 Banco Central do Brasil. (2024). Service Quality Index.
29 Banco Central do Brasil. (n.d.-a). Pix Statistics. https://www.bcb.gov.br/en/financialstability/pixstatistics
30 NCPI. (n.d.-b). UPI Product Statistics. https://www.npci.org.in/what-we-do/upi/product-statistics
31 Banco Central do Brasil. (n.d.-b). Pix Indexes – Methodologies and Results. https://www.bcb.gov.br/estabilidadefinanceira/indicespixmetodologias
32 Note that independent research studies on the user experience of PIX were not available at the time of writing this paper,a nd we use the PIX quality of service index as a proxy for user centricity.
33 Narayan, A., & Prasad, S. (2023). Do UPI In-App Grievance Redress Mechanisms work for constrained users? Dvara Research. https://dvararesearch.com/wp-content/uploads/2024/01/Do-UPI-In-App-Grievance-Redress-Mechanisms-work-for-constrained-users_31-March.pdf

needs, although they vary in their resourcing levels and structures to give effect to this themselves. Operating a tiered infrastructure does not absolve them of the need to consider end user needs. They have already adopted some customer-centric measures that help to orient them in the direction of user centricity on an ongoing basis. However, there is more to learn from understanding how they, and other similar systems, have progressed to date and from encouraging and supporting their ongoing moves to grow in user centricity over time.

Operating a tiered infrastructure does not absolve them of the need to consider end user needs.

05 Conclusion

This brief has argued that the concept of user centricity can and should be applied to DPI. The concept can be defined drawing from existing sets of principles and informed by the bottom-up experiences of leading instant payment systems. Even in two-tier financial infrastructures, which do not directly touch end users, user centricity still matters for at least two reasons:

- The very meaning of DPI stems from being available and accessible to the public at large, which requires that user needs be considered upfront and over time — call this the **"public interest" reason**.
- There is evidence that the long-term usage of a system is likely to be greater to the extent it is user-centric — call this a **"private interest" reason** both for participants and end users since many of the benefits (including a sustained low cost per transaction and the ability to pay anyone in an economy easily) derive from widespread usage.

User centricity matters not only at the initial design stage of a DPI; it is a dynamic, rather than a static, concept. Users' needs and preferences change, and programs need to adapt, too. In many ways, **innovation at DPIs like these can be understood as a dynamic form of user centricity**, as systems innovate to introduce new use cases or adapt their protocols over time. The ability to sustain dynamic user centricity is a function of how the governance structures prioritize development on the systems roadmaps and make adjustments over time. The forms of governance that support dynamic user centricity require further study to understand.

Both payment systems considered here already publish considerable

aggregated data on a regular basis. However, to understand better the journey to user centricity, DPI systems should be encouraged to provide access to anonymized data sets on usage that can be accessed by independent researchers. This is also needed in areas like grievances and disputes. Systems data like this should be complemented by ongoing surveys and other forms of user and non-user research. To collect data and undertake research requires resources. This can be challenging for DPIs facing strong pressures to minimize their operating costs, which are passed back to participants in some form.[34] However, there is a case for donor funding to fill the gap and enable the data which would help maintain user centricity over time.

The payment systems described in this brief are leading examples of "first generation" DPI[35] in emerging and developing markets. To some extent, they have embodied elements of user centricity in their design and practices but can go still further. "Next generation" DPI will demand yet more user centricity; in setting out their ambitious vision for the "Finternet" (a form of layered DPI in which digital assets of all sorts can be exchanged and paid for with low friction and high trust), Agustin Carstens and Nandan Nilekani place "Users at the center" at the top of their list of necessary design principles.[36] What this means in practice and how to monitor it over time will require much further work and effort. However, the practices and experiences of DPI programs like these two can help to inform an emerging understanding of user centricity. This may also guide new systems that are being designed based on their experiences.

34 RBI's discussion paper from 2022 indicated that various stakeholders collectively incur a cost of Rs 2 for processing a UPI Person to Merchant payment for an average transaction value of Rs. 800. See Reserve Bank of India - Publications. The current subsidy of Rs. 1.5 billion is considered insufficient for charges incurred given the current volume of transactions per month. See UPI transactions are rising, but who will foot the bill?, BFSI News, ET BFSI

35 For a description of "first-generation" DPI, see: Porteous, D. Vora, P., Shankar Chaturvedi, R., & Rabley, P. (2025, October 2). Understanding Digital Public Infrastructure: What it Means — and Why it Matters — to Businesses and Governments in Emerging Markets. Next Billion. https://nextbillion.net/digital-public-infrastructure-why-it-matters-business-governments-emerging-markets/

36 Carstens, A., & Nilekani, N. (2024). Finternet: the financial system for the future. BIS Working Papers No. 1178. https://www.bis.org/publ/work1178.pdf

06 Future Areas for Research

User centricity is one of three crucial features of well-designed payments systems, the other two being security and ubiquity. This paper is a first step at outlining user centricity in the context of digital public infrastructure. In our attempt to understand user centricity, we focused on the payments layer of DPI for this paper, keeping the scope more focused. There is a need to understand how user centricity is affected by broader features of the DPI system like governance and accountability, fair competition, and other factors. Even within the consideration of the complex payments ecosystem, this paper is a first step; there is a need for deeper research to understand how these principles of user centricity would hold water for each individual actor in the payments space. This is particularly important when considering third-party applications that offer access to instant payments in several markets.

In this paper, we have touched on the importance of grievance management as one of the core principles of being user-centric. The research on what needs to be implemented in the form of grievance redressal is just beginning, with initial work by Dvara Research on UPI in India.[37] As various countries implement their own instant payment systems, this needs to be deepened for specific user segments. Designing better grievance management systems also requires transparent updates on the number of complaints received, the time taken to address complaints, and other factors that would help build user trust. This is an area that needs both research and technical assistance to system operators to ensure transparent public communications.

37 Narayan and Prasad (2023)

User centricity in DPI is closely linked to ubiquity, especially when the objective is digital financial inclusion. This requires a focus on users who are currently unserved or unable to access the services that are delivered on the DPI rails and is likely to differ in various factors ranging from the size of segments between markets to capability, which has implications for the scale, economics, and assessments on what successful adoption and usage mean. A related question that remains to be examined through further research is the question of governance and accountability, especially when the system manager and operators are either the government or closely connected and backed by the government. This is important to keep in mind, since it can affect competition, and therefore choice and user centricity.

Finally, while there is a case for further research, this paper is a step towards building an understanding of what user centricity may look like in the fast-moving DPI space. This space is usually neither fully private nor fully public, and it can embody greater complexity than purely private or purely public digital services. However, neither the rising interest in deploying DPI nor its complexity should obscure the case for it to be designed to be user-centric from the start and operated so as to remain user-centric, if indeed it is to be widely trusted and sustainable.

Annex: Lists of the Relevant Principle Sets Cross-Referenced in Figure 1

1. PRINCIPLES OF USER-CENTRIC DESIGN (UX LEADERSHIP ACADEMY)	2. GOOD PRACTICE PRINCIPLES FOR PUBLIC SERVICE DESIGN AND DELIVERY IN THE DIGITAL AGE (OECD)	3. RESPONSIBLE DIGITAL PAYMENTS PRINCIPLES (UN)	4. ESMS HANDBOOK (IFC)
D1. User involvement	**O1.** Understand users and their needs	**R1.** Treat users fairly	**E1.** Have a policy
D2. Understanding and specifying user context	**O2.** Make D&D of public services a participatory and inclusive process	**R2.** Ensure funds are protected and accessible	**E2.** Identify risks and impacts
D3. Clear and concise interface	**O3.** Ensure consistent seamless and high-quality public services	**R3.** Prioritize women	**E3.** Put in place a management program
D4. User feedback	**O4.** Create conditions that help teams D&D high-quality services	**R4.** Safeguard client data	**E4.** Build organizational capacity and competency
D5. Interactive design	**O5.** Develop consistent delivery methodology for public services	**R5.** Design for individuals	**E5.** Emergency preparedness & response
	O6. Curate an ecosystem of enabling tools, practices, and resources	**R6.** Be transparent, especially on pricing	**E6.** Stakeholder engagement
	O7. Be open and transparent in D&D of public services	**R7.** Provide user choice through interoperability	**E7.** External comms and grievance management
	O8. Ensure trustworthy and ethical use of digital tools and data	**R8.** Make recourse clear, quick, and responsive	**E8.** Ongoing reporting to affected communities
	O9. Establish an enabling mechanism for culture and practice of public service D&D		**E9.** Monitoring and review

Additional References:

Banco Central do Brazil. (2023). Pix Management Report: Conception and first years of operation 2020–2022. https://www.bcb.gov.br/content/estabilidadefinanceira/pix/relatorio_de_gestao_pix/pix_management_report_2023.pdf

IFC Environment Division. (1998). Doing Better Business Through Effective Public Consultation and Disclosure: A Good Practice Manual. https://www.ifc.org/content/dam/ifc/doc/mgrt/publicconsultation.pdf

Raghavan, M. (2020). Transaction Failure Rates in the Aadhaar Enabled Payment System: Urgent Issues for Consideration and Proposed Solutions. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3604119

CENTER *for* FINANCIAL INCLUSION | ACCION

The Center for Financial Inclusion (CFI) works to advance inclusive financial services for the billions of people who currently lack the financial tools needed to improve their lives and prosper. We leverage partnerships to conduct rigorous research and test promising solutions, and then advocate for evidence- based change. CFI was founded by Accion in 2008 to serve as an independent think tank on inclusive finance.

www.centerforfinancialinclusion.org

Center for Financial Inclusion (CFI)