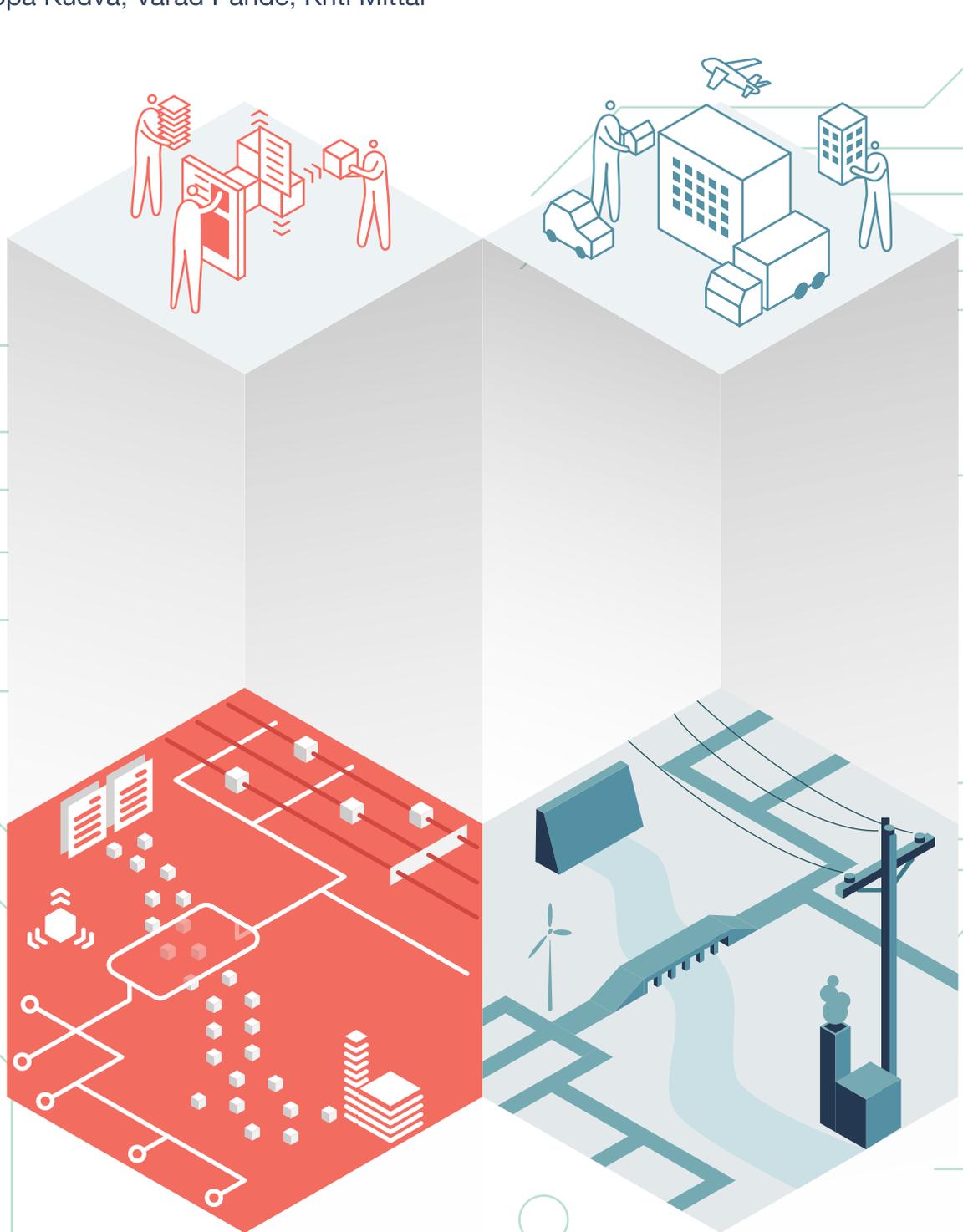


Widening India's Digital Highways:

The Next Frontiers for Open Digital Ecosystems (ODEs)

By Roopa Kudva, Varad Pande, Kriti Mittal



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About Omidyar Network India

Omidyar Network India invests in bold entrepreneurs who help create a meaningful life for every Indian, especially the hundreds of millions of Indians in low-income and lower-middle-income populations, ranging from the poorest among us to the existing middle class. To drive empowerment and social impact at scale, we work with entrepreneurs in the private, nonprofit and public sectors, who are tackling India's hardest and most chronic problems.

We make equity investments in early stage enterprises and provide grants to nonprofits in the areas of Digital Society, Education, Emerging Tech, Financial Inclusion, Governance & Citizen Engagement, and Property Rights. Omidyar Network India is part of The Omidyar Group, a diverse collection of companies, organizations and initiatives, supported by philanthropists Pam and Pierre Omidyar, founder of eBay.

To learn more, visit www.omidyarnetwork.in, and follow us on [LinkedIn \(Omidyar Network India\)](#) and on [Twitter \(@on_india\)](#)

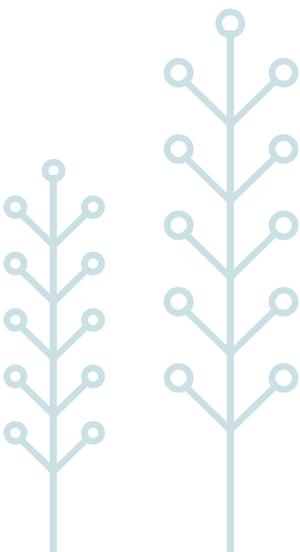


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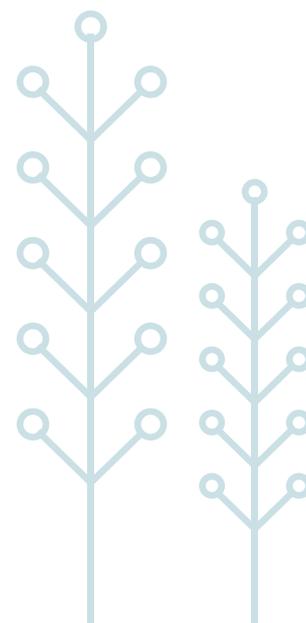
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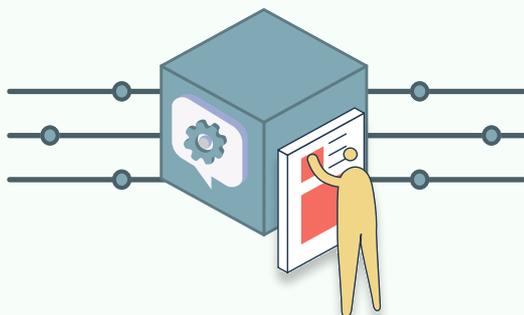
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A. The story so far

Since the launch of Aadhaar in 2010, India has made rapid strides in developing its ‘digital public infrastructure’. The key paradigm shift has been this: rather than building more siloed technology systems, India has embarked on the journey of building Open Digital Ecosystems (ODEs) – a paradigm where shared digital building blocks – data registries, protocols, standards for interoperability and data exchange - are created, which can be leveraged by the government and private sector innovators to roll out citizen-centric services at population scale.

Starting with ID (Aadhaar) and payments (UPI), the ODE approach is now seeing impressive implementations in several sectors including health, education, urban governance, and law & justice.



The key paradigm shift has been this: rather than building siloed tech systems, India is building Open Digital Ecosystems (ODEs), which can be leveraged by government and private sector innovators to roll out citizen-centric services at population scale. India has an opportunity to be a learning lab for the world on how to make the digital economy work for every citizen.

The socio-economic impact of ODEs is large: it is estimated that National level ODEs could collectively create new economic value of USD 500+ billion (INR 35+ lakh crore) or ~5.5% of India’s projected GDP in 2030, and also generate USD 200+ billion (INR 15+ lakh crore) in savings. Even during this pandemic, the Indian government was able to transfer more than INR 37 thousand crore directly to the bank accounts of 16 crore citizens using India’s digital infrastructure.



Many now consider India as a ‘lighthouse’ in the way it has gone about designing this digital infrastructure, and its experience is informing the build of global digital public goods for identity ([MOSIP](#)) and payments ([Mojaloop](#)).

So what are the promises and perils that the ODE approach throws up for India in the decades to come? Where should India focus next to deliver on the true potential of ODEs? We share our perspective based on 3 years of work understanding and contributing to this space.

B. The three layers of ODEs

The ODE framework has three layers, and they are analogous to how we think about physical infrastructure.

The first is the tech layer or the digital infrastructure itself. Think of these as road highways in the physical world. In India, we are now coalescing around the shared understanding that digital infrastructure needs to be modular, open API, open source and interoperable.

The second layer is community engagement. Community refers to entrepreneurs and other builders who ensure that the infrastructure actually gets used and solutions are built on top. It also refers to tech developers and civil society organisations who engage to ensure continuous improvements and hold government to account. We saw the crucial role civil society and the media played in the making of Aadhaar. The healthy debates of democracy led to a fundamental right to privacy enshrined in the Constitution, and legal guardrails on where and how Aadhaar may be used. We see a similar role for community engagement in ODEs.

The third layer is governance: the “rules of the game” and the institutions that uphold them. Here too the issues are similar to physical infrastructure. Who is responsible for creating and maintaining infrastructure — government, private sector or PPP mechanisms? Who should own it? Who pays for the services — governments or users? Do we need a regulator? What is the recourse in case of harms? Like we have speed limits for road safety, and aviation security norms, issues related to data privacy and security in the digital world need addressing.

Together, community and governance are the crucial “non-tech” layers of ODEs.



Governance

Laws and rules that govern the ecosystem and accountable institutions that uphold these rules



Community

Collaborative community who transact via the digital platform to create value for all



Tech

Technology infrastructure that facilitates co-creation for the delivery of services to end users.

C. The importance of the non-tech layers for societal health

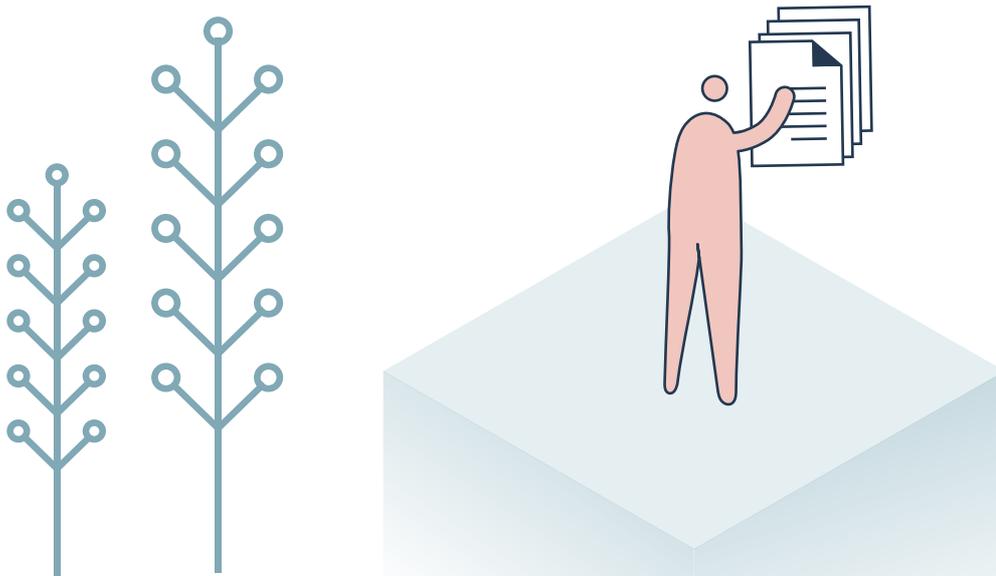
India is acknowledged as a pioneer in the first layer — digital infrastructure. Aadhaar and the India Stack are powerful examples of ‘digital highways’ with a vision to enable traffic of all kinds of services that can ride atop. We were one of the first developing countries to have a population scale digital identity, and have built a low cost digital payments infrastructure.

India is in the initial phase of the journey on the non-tech layers: governance and community engagement. But they are as important as the tech layer as these will ultimately inform how much the underlying infrastructure will drive societal wellbeing. As civil society groups have pointed out, these transformative technologies come with their own set of risks – if not designed well, they can end up creating grave harms to and excluding citizens from essential services.

Our work at Omidyar Network India has focused on strengthening the non-tech layers of ODEs in order to realize their true potential for enhancing societal health.



We believe the non-tech layers of governance and community engagement are critical, as they will influence how much the underlying infrastructure will drive societal health. Our focus is hence on strengthening these non-tech layers



D. How Omidyar Network India is supporting the ODE movement



A. Tech: Enabling the design of digital infra to be user-centric

Getting the design right for the core building blocks of ODEs, the data layer in particular, has been an important focus. The [National Data Analytics Platform \(NDAP\)](#) currently being built by the NITI Aayog, to which [ONI is providing support](#) through a team led by [IDInsight](#) & [Development Data Lab](#), will be the first open data platform in the world with population scale foundational data sets mapped to a common data schema. This means that data from the population census, health census and administrative data from any government departments, which currently reside in different silos with varying data standards, can now be analysed together, at various levels of granularity. This will provide valuable insights for policy makers, researchers and citizens, bringing greater transparency and accountability.



B. Community Engagement: Engaging citizens and energising open source innovators

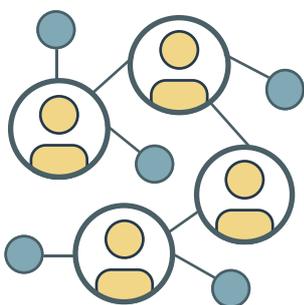
The digital divide in India is shrinking, with the [Next Half Billion](#) first-time internet users coming online. However, population scale digital infrastructure must ensure universal access. This requires leveraging civil society intermediaries and offline architectures, recognizing that the digital platforms must proactively cater to the newly online and those entirely offline, as discussed in [this study](#) by [Aapti Institute](#). The other key aspect of ‘community’ in an ODE is the ‘innovator community’. The Free & Open Source Software (FOSS) ecosystem plays a key role here, as illustrated in [this report](#) by our partner, [CivicDataLab](#). Digital Public Infrastructure should ideally be built using FOSS, which reduces cost and avoids the trap of “vendor lock-in”. FOSS can also create more trust between the government and citizens - FOSS communities can examine the open source code for adherence to data privacy principles, help find bugs, ensure transparency and accountability. For example, a bug in India’s Covid-19 vaccination app CoWin, which is built on top of the open source digital platform DIVOC, was [recently identified and reported](#) by a volunteer open source developer through the DIVOC community forum.



C. Governance: Strengthening rules of engagement and citizen-centric safeguards

The laws and rules that will govern India’s digital ecosystems are still being framed, and some of the key institutions that will uphold these rules are yet to be established. Our partners have brought much needed attention to this ‘governance layer’ of ODEs, for example, [this work](#) by the [Centre for Internet & Society](#) that examines data exchange models in the context of welfare delivery, and recommends best practices to safeguard citizens’ data and privacy. Many State Governments across India are now building ‘social registries’ for better targeting and delivery of social protection programs. The [KALIA program](#) for delivery of subsidies to farmers in Odisha for example, relied on a registry of farmers created by integrating datasets available with multiple departments of the state government, with algorithms deployed to determine the target beneficiaries.

While such systems can lead to greater efficiency in Government to Citizen (G2C) service delivery, they can also expose citizens to potential harms and lead to unintended exclusions. Households that depend on these programs are already socioeconomically vulnerable, and therefore having a robust governance framework in place for such Social Protection ODEs (SP-ODEs) is particularly crucial – an area where our partner [Dvara Research Foundation](#) has initiated new research.



ODEs should be built using Free & Open Source Software (FOSS), which reduces cost and avoids traps such as “vendor lock-in”. FOSS can also create more trust between the government and citizens

E. Our Investments in Open Digital Ecosystems (ODEs)

Support Design of Robust Digital Infrastructure

- ◀ **Our Strategy** Support responsible ODE builds and pilots through investments in platform design, architecture and/or technical support to demonstrate the impact potential of ODEs

- ◀ **Our Investments**



IDinsight
PMU to support NITI Aayog's National Data Platform (NDAP), a global-first open data platform to ease access to government datasets for policy makers, researchers and citizens



India Digital Ecosystem for Agriculture (IDEA)
As an invitee to government working group on IDEA, ONI brought in the voice of Agritech startups and helped shape the thinking on data exchange standards

Nurture Community

- ◀ **Our Strategy** Support a vibrant community of open-source technologists, startups and civil society to drive adoption of responsible ODEs

- ◀ **Our Investments**



Aapti InSTITUTE
Unpack the 'last mile' barriers faced by low-income communities when accessing urban ODEs



Civic Data Lab
Map the evolution of and roadmap for Free & Open-Source Software (FOSS) ecosystem in India



The Quantum Hub
Amplify the ODE discourse and deepen the focus on the "non-tech" layers



FOSS4Gov Innovation Challenge by Ministry of Electronics & IT (MeitY)
ONI is supporting mentorship and a prize on citizen-centric safeguards in this challenge

Strengthen Governance

◀ Our Strategy

Support robust 'rules of the game' through use of responsible tech and frameworks and strengthen institutions to mitigate potential risks

◀ Our Investments



Ministry of Skill Development & Entrepreneurship (MSDE)

Work with a network of partners including Dalberg, NIPFP & Samagra Governance to reimagine the skills ecosystem anchored by digital infrastructure, collaboration and innovation



Dvara Research

Create a robust governance framework for social protection ODEs



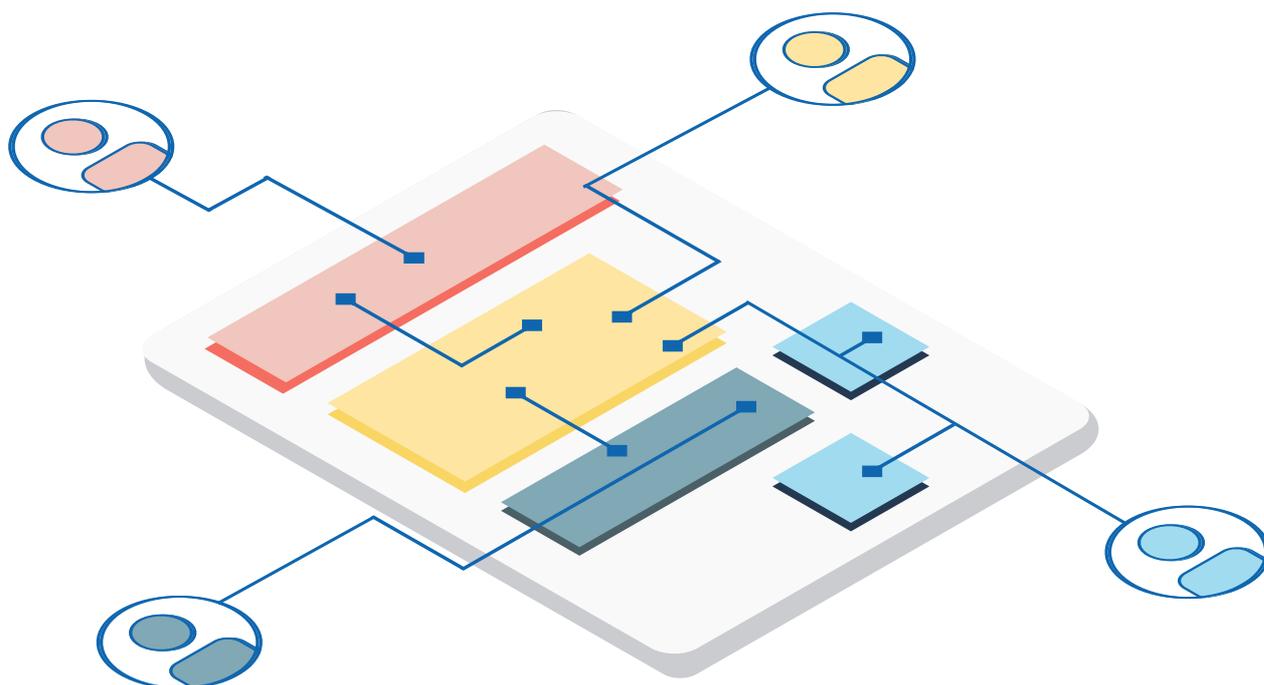
Samagra Governance

Support the Government of Odisha to document learnings from KALIA scheme, especially key data exchange principles



Grants for Research Papers

on 'Privacy Preserving Data Exchange Models' by Centre for Internet Society', on 'Financing ODEs' by IDFC Institute



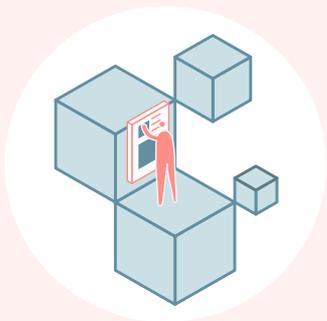
F. The next frontiers for ODEs

As the ODE approach gets more mainstreamed, we believe it is critical to keep the focus on the non-tech layers, so that the true potential of ODEs to enhance societal health can be achieved. Specifically, we will double down on **supporting five key priorities:**



1. Citizen-centric protocols & safeguards:

Leading with open protocols and standards, rather than bringing these in later would help create a level playing field (the current effort to design an [Open Network for Digital Commerce](#) is an example of a step in this direction) and foster greater trust. Mitigating the potential risks of centralized databases and other threats to individuals' privacy, rights and safety online are all issues that must take centre stage. A key piece of the core digital infrastructure layer in ODEs is secure and streamlined data exchange. Global examples such as Estonia's [X-Road](#) and domain specific solutions such as Linux Foundation's [AgStack](#) or Digital Green's [FarmStack](#) for agricultural data exchange can provide good learnings. This will be particularly important in sectors like social protection, where the primary users are the most vulnerable and marginalised.



2. Robust institutional structures that create trust in ODEs:

Institutional capacity is needed to operate and maintain digital infrastructures, so that they are sustainable and trusted national assets. This will involve setting up both accountable government institutions with the right regulatory controls, and non-government institutions that can provide alternative 'bottom-up' solutions and offer outside-in checks and balances. For example, we have recommended the setting up of a high-powered 'NODE Council' to develop policies, guidelines, standards, and frameworks for governance of ODEs. On the community side, an independent 'Centre of Excellence' for open-source digital commons may be established to deepen the engagement of open-source communities and civil society in this movement.



3. Deeper adoption of ODE principles in GovTech:

For the ODE approach to become the ‘default’ in government tech builds, Ministry of Electronics and Information Technology’s (MeitY) White Paper on National Open Digital Ecosystems (NODEs) needs to be operationalised. This involves many concurrent steps. First, the White Paper, which received more than 100 responses during public consultations, can be converted into an implementation ‘blue book’ so it becomes easy to use by practitioners. Second, a ‘FOSS4GovTech Repository’ of plug and play open-source building blocks can be created that government departments can configure easily for their own use-cases. Third, public procurement processes can be modified to make them more ODE and open source friendly. Fourth, a highly skilled tech team with the mandate to operationalize the ODE approach can be embedded in government. An example of this is the [18F team](#) of top technologists modernizing government digital infrastructure in the United States.



4. Incentives and collaboration for open innovation:

Designing the right incentives for the open source community, start-ups, civil society, and industry players to participate in ODEs should be an important priority. The [Ayushman Bharat Digital Mission](#), for example, has set up a ‘[sandbox](#)’ environment to allow testing of technologies by any entity who wishes to participate and integrate with them, in a contained environment. The [National Urban Digital Mission](#) and the envisaged [India Digital Ecosystem for Agriculture \(IDEA\)](#) both plan to create similar sandboxes. Another way to encourage collaboration around ODEs, especially by open-source developer communities, would be to organize hackathons or challenges, such as the [FOSS4Gov Innovation Challenge](#) recently launched by MeitY (supported by Omidyar Network India) that invites teams to build ERP and CRM solutions for population scale use-cases.



5. A ‘phygital approach’ to make ODEs work for every Indian:

Designing solutions for every Indian, not just the tech savvy Indian, has to be at the heart of the ODE mission. This means putting in place last-mile infrastructure that combines the best of technology with the appropriate human interface. Trusted [community anchors](#) must be [leveraged](#) to ensure that technology reaches the most marginalised, and [behavioural nudges](#) need to be tried to make people more conscious of their own sensitive personal data, and build greater trust with digital platforms.

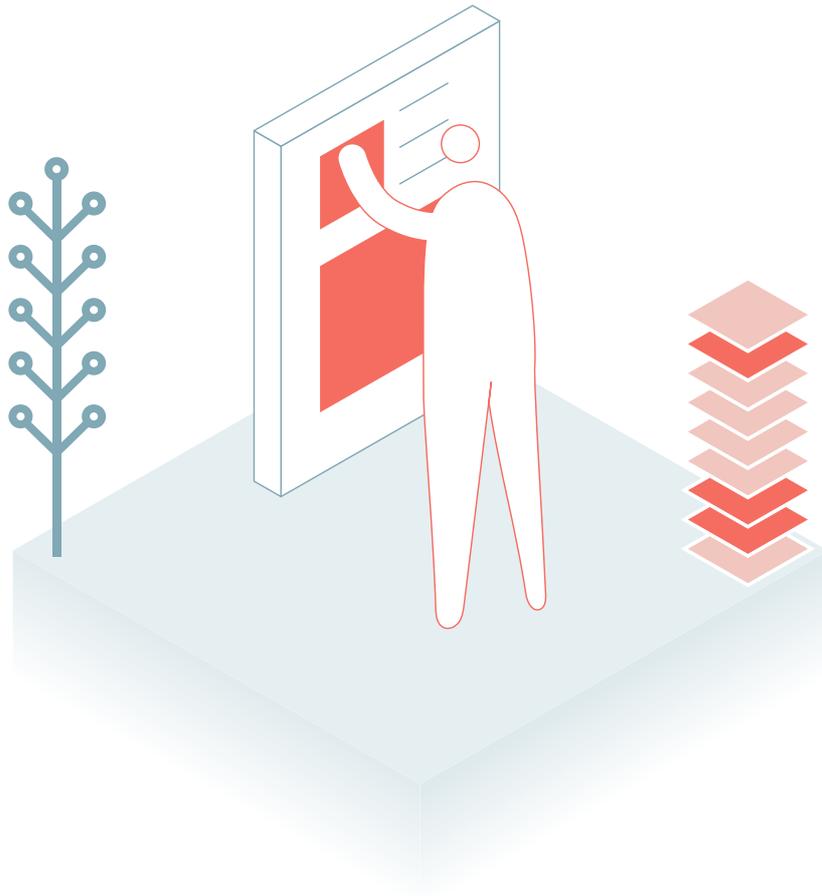
In Conclusion

We believe India has an opportunity to be a learning lab for the world on how to make the digital economy work for every citizen. In an era where technology giants are building platforms that influence every aspect of our lives, India's ODE story is one of a country striving to carve out inclusive digital commons. The decisions made in the next few years on ODEs will influence India's societal health for decades to come. The time for meaningful conversations and deliberate action on this agenda, is now.



Designing solutions for every Indian, not just the tech savvy Indian, has to be at the heart of the ODE mission.







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