Policy Opinion

Centre for The Digital Future

Consultation Paper on IDEA

BY

CENTRE FOR THE DIGITAL FUTURE

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Centre for The Digital Future (CDF) https://cdfresearch.org, is an independent research institution within the not-for-profit India Development Foundation (www.idfresearch.org). Our diverse team possesses knowledge across sciences, economics, policy, law and technology and rich experience in policymaking, regulation, industry, associations, think tanks and academia.

We at CDF aim to positively impact public policy and practices in the realm of digital and data ecosystem through actionable recommendations with evidence-based research and insights so that business related policies become robust, predictable and deliver the best outcomes. We believe that our approach will help India and Indian citizens with a greater value accrual from the digital economy.

Please find below our considered views on the subject matter captioned hereinabove.

Introduction:

The consultation paper on IDEA is very detailed and comprehensively frames the value that can be derived from agriculture data and ploughed back to the stakeholders of the ecosystem for increasing efficiency, productivity and thereby bringing significant economic benefits to all the stakeholders, especially those directly involved in agriculture and the startup ecosystem in the country.

Out of the seven questions, according to us, three are critical to launch the project in the envisioned manner. These are:

1. Although socially and ideologically much needed, can the project be justified on sound economic principles?
2. What should be the involvement of the government [Centre as well as states]?
3. How to involve private enterprises in the project?

Accordingly, we are responding to these three questions in addition to our views on the proposal for regulatory sandbox.

1. Estimating the potential for data in the agricultural ecosystem

Estimating the potential of data economy in any sector is not a straightforward exercise, leave alone in the case of agriculture given the enormous diversity, vastness and complexity of the ecosystem. A further complication is that data (and hence information) may not be the solution to all the problems in agriculture.

In this section, we propose a methodology to estimate the aggregate value that can accrue to the economy through data sharing in agriculture. This methodology will also illustrate what a data economy in agriculture would be like and hence forms the conceptual backbone to the rest of our submission on how to design, develop and deploy the proposed data sharing platform. Given an official mandate and a certain time frame, if

needed, CDF has the capability of using this methodology to arrive at some hard numbers.

Let us begin by considering a skeletal agriculture value chain focusing on those activities where the farmer is directly involved. Figure 1[1]

In each of these activities there are a number of other stakeholders, apart from the farmer, who are involved and where data can play an enabling role for the farmer.

To take some specific examples:

- In the preparation stage, accurate predictions about the weather and future commodity prices could allow better coordination and planning amongst farmers.
- In sowing and production stage, information on soil quality, weather, etc. could enable the farmer to optimally apply various inputs into the production process.
- Accurate information about current prices available for their produce in various mandis, can allow the farmer to realise the best possible returns for their yield

Consider the market for agricultural credit and insurance. In the present scenario, acute asymmetry of information between the farmer and the lender, handicaps these markets and can even stop them from developing. But if more precise information about the type of the borrower were available it might allow the market for agricultural finance to grow. Currently however, the data that can lead to this insight is scattered among the host of financial institutions that populate this market – scheduled commercial banks (both public and private), non-banking financial institutions (technology enabled and traditional), various types of insurance providers etc. and the informal money lenders. However, even lenders may also benefit from having access to other kinds of data (from *Mandis* for example) – this can allow them to construct profiles of borrowers, thus increasing confidence in dispensing credit.

While bilateral commercial deals on data sharing already happen, to obtain the true benefit of data in this ecosystem what is required is the ability of multiple data holders to interact with multiple data users to identify and operationalize mutually profitable data sharing arrangements. This requires

[1] This value chain is just to illustrate the methodology. It is not meant to be an accurate description of the agricultural process *per se*.

a platform. Without one, the cost of discovery and negotiation in bilateral deals would be too high to allow the market to develop efficiently. This is what forms the basis of our detailed responses below. But first, we discuss how one can estimate the size of the data economy in this case.

The complexity of the ecosystem makes it almost impossible to estimate the direct benefits of the data sharing platform to the farmer.[2] However, the aggregate benefits to the economy as a whole can be estimated.

Using a database like Tracxn[3] one can estimate the total market value of agri-tech startups. For each company, its market valuation reflects the current value of its future stream of profits. It thus is a measure of how much value the investors/market expects this agri-tech startup to generate in its lifetime. Aggregated over all such companies we can obtain the total expected value of the agri-tech ecosystem currently. For a number of reasons, this estimate will be a lower bound on the value that the platform envisaged in the AI4AI proposal will generate.

1. This calculation does not take into account the value that these companies will generate for their consumers. For example, if an agri-tech startup uses data to provide credit to currently underserved farmers, its valuation only reflects the share of the value that accrues to it. It does not account for the value that accrues to the farmer from using its services – maybe in the form of increased incomes.[4] Please see **annexure 1** for a more detailed discussion of how the value accruing to the farmer can be estimated.
2. The current transaction costs in the data ecosystem are high. As the efficiency increases (perhaps by initiatives like IDEA) the value generated will also increase.
3. There are companies – such as scheduled commercial banks – which are not entirely focused on agriculture but they will also benefit from the data sharing platform. They will not be covered in the above estimation.

The estimates above can be refined in the following way

Sample companies in each of the activities in the agricultural value chain and understand from them

I. how much they believe the market potential to be for their business and

II. how much value do they generate for the farmers (if they charge the farmers directly then that would be an estimate of the value left to the farmer)

The answers to the above can then be used to refine the estimate obtained through step 1 proposed above.

[2] Detailed investigations of individual data sharing innovations can potentially be estimated. See Goyal, A. (2010). Information, direct access to farmers, and rural market performance in central India. *American Economic Journal: Applied Economics*, *2*(3), 22-45 for the benefits accruing to farmers from the development of ITC's information kiosks and local procurement in Madhya Pradesh.

[3] Tracxn is a global platform for private market investors and corporates to track startups

[4] In economic terminology the proposed methodology only estimates producer surplus, not the consumer surplus.

2. Role of the government

Government intervention in market activity is typically desirable only under conditions of market failure. In the present case, we argue for government involvement for two reasons.

1. Co-ordination failure

The creation of the above platform will require the on-boarding of multiple stakeholders. These stakeholders will act both as data creators (holders and sharers) as well as data users.[5] To get the platform going both providers and users of data have to be on-boarded simultaneously on to the platform. Having only one side of the market, or insufficient numbers of one side, does not result in the creation of a platform. Co-ordination among so many players requires significant up-front investments. In a sector where typically the end user of these services – the farmer – may be unable to pay for any services ultimately provided to them, participants may not have the incentive to pay the setup costs required for the platform.

2. Public ownership of a significant number of entities in the agricultural ecosystem

A significant number of participants in the agricultural ecosystem are owned and controlled by the government. It may thus be cheaper and more efficient for the government to incentivize them to come on-board the platform than it will be for a private entity.

Thus, the government can play a significant role in coordinating the setup of the platform. However, post that there should be no involvement by the government in either controlling or owning the platform. As a technology platform, the entity should be independent, innovative and entrepreneurial.

The government's role should be limited to creating the mandate for the platform [data exchange] and help set it up by PSUs, or public-private partnerships like NPCI and NIXI. The discussion below builds on the structure of NPCI [should more details be necessary, a meeting could be held by the Ministry with the founding CEO Shri AP Hota or the current CEO, Shri Dilip Asbe.]. Please find attached a note on NIXI in **Annexure 2**.

The Board of this platform must be diverse, dynamic and dedicated to the mission by responding to the changing circumstances and scope of its mandate and services. The platform should be funded by largest beneficiaries of the platform. These include but are not limited to banks, credit agencies, agricultural cooperatives and companies engaged in fertilizers, seeds, farm equipment and food processing. A critical mass is needed with initial capital infusion and the promoters can have a seat on the board and accordingly, wield the power and control.

This core funding should be sufficient for building the technology platform as well as provide for maintenance of the platforms for the first three years.

[5] However, as explained later, to get traction on the platform the first movers have to be the ones who currently have significant data to share, say scheduled commercial banks.

There may be a government subvention provided for maintenance for three to five years with a sunset clause.

The main role of the government would be to establish a protocol on:

a) Mandatory data sharing by all government agencies, PSUs, cooperatives and state government-controlled entities to provide data to this exchange

b) All those private sector companies who wish to be a part of this exchange also need to contribute their data [no net consumer can be a part of the exchange]

The rules and protocols for data sharing through APIs should be set up by the technical committee of the exchange.

The data exchange can have hubs in some of the states [where the state governments are more proactive and collaborative] both of collecting and sharing data. This will render it a federated structure.

The secretariat would be headed by a professional / technopreneur, supported with a strong technical and business team. The data platform will comply with the extant rules, regulations and standards (such as PCI DSS for Garde I).

3. <u>Encouraging private players to join and grow the platform</u>

The first efficiency gains from the platform will come from the sharing of data amongst the founding members.

A second order of gains will come from on boarding agri-tech startups and the like. These gains will be derived from:

a) Network externality not only in terms of additional nodes but also potentially, additional types of data; these could open opportunities for cleaning and streamlining data streams via triangulations;

b) Direct use of data from the platform to provide solutions to the agri-community;

c) Indirect benefits to startups by providing service to participating or non-participating commercial entities [For example, a large number of NBFC's may not wish to participate, a start up by becoming a beneficiary of this platform could provide service to these NBFC on lending]; and,

d) Start-ups could also provide B2B services to other non-participating companies such as (Fast-Moving Consumer Goods (FMCG) companies on the assumption that "agri-ecosystem" data in so far as it impacts a large section of the population is important to consumer goods, FMCG and many other sectors as well.

The incentive for these private companies to join could simply be that they would have access to much better-quality data from the platform than they could get otherwise.

Moreover, the platform once developed should introduce pricing mechanisms for the exchange of data on it, charge reasonable service fee to become self-sustaining.

4. Innovation

In light of the above comments, our specific response to Q6 'Innovation around IDEA' and 6A (wrongly numbers as 5A) 'Is IDEA Sandbox [I-Box] necessary?' is that a government driven sandbox for agricultural start-ups is not needed and will not serve any useful purpose.

Instead, it would be better to support various existing incubators, hubs and sandboxes some of which have a significant representation of agricultural start-ups and offer all the proposed sandbox facilities and benefits to them. Consequent to this view, Q 6B (wrongly numbers as 5B) 'What should be the implementation model for I-Box?' does not arise.

5. **Nodal Point of Contact at CDF on this Submission:**

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Annexure 1.

Estimating the value of data sharing in agriculture to farmers

This section briefly lays out a proposal for a detailed estimation of the value of data sharing in agriculture to the farmer and also the potential for such a data economy.

Farmers' gains from data sharing in the ecosystem can come from two sources

a) New services based on data. Companies providing innovative data based services directly to farmers. Take for example, a technology startup that uses the location of the farm, transport connections, local *Mandi* prices etc. to provide real-time information to farmers about the best place to sell their produce. A variation of this will be an e-commerce platform allowing direct to consumer sales.

b) Existing services better delivered using data. A good example for this could be new technology and data enabled lenders in the agricultural finance market.

Both these types of services have the potential to improve farming processes and farm incomes. And the provision and use of these services may lead to the creation of additional value in the economy. That is, value over and above what was being created in the absence of that service.

The division of this surplus between the farmer and the company providing the service depends on both the structure of the demand as well as the structure of the market providing the service. If there is a monopolisation of the market then the prices will be set such that more of this value passes to the service provider and less is left to the farmer. If the market for providing said service is competitive then the farmer will get to keep more of the value. Similarly, if there is a monopsony – buyers, in this case farmer's having market power – then more of the value will be left to the farmer. This qualification is important to keep in mind while interpreting any of the estimation results obtained from the methodology proposed here.

The estimation of the value accruing to the companies has already been discussed in the main body of the text. Here we expand a little on how the valur to the farmers can be estimated.

In case 1 above, the price that the farmer pays for the service is a good indicator of how much the farmer's value of the service is. If he pays a price 'p' for the service then it must be the case that the value to the farmer is higher than 'p'. The information on pricing can be obtained from the companies – perhaps through sampled survey (as mentioned in the text).

In case 2, something similar can be done. Data enabled services in agriculture aim at improving efficiency in farming by reducing the costs of

farming. Making better inputs available at lower rates. One could then compare the new cost of services by costs that prevailed before the company started its business. Some of this information could again be available with such companies itself.

For a more comprehensive assessment, a carefully structured primary survey carried out with the farmers who are customers of these existing companies can be used to understand the increase in farmers' incomes because of the services being provided by the company.

These estimates can then be scaled up by the **total number of farmers** who could be similarly impacted if the service were available to them to obtain the potential of the data economy in agriculture.

Annexure 2

National Internet Exchange of India (NIXI)

A model of exchange amongst private sector entities, facilitated by the government

Overview

NIXI is a not-for-profit company with no equity, incorporated in 2003 with a grant-in aid from the then Department of Information Technology (DIT is now known as MeitY), Government of India.

It was set up to provide neutral peering points for exchange of data traffic amongst different ISPs. Subsequently, the sovereign function of managing the '.in' country code top level domain (ccTLD) registry was delegated to it and later, it also became the National Internet Registry (NIR) that allocates IP addresses (both IPv4 and IPv6) and Autonomous System Numbers (ASN) to eligible entities within India.

It is pertinent to mention here that earlier VSNL (now known as Tata Communications) used to act as the de facto Internet Exchange in India even as an ISP, it used to compete in the market with other ISPs thereby creating a conflict of interest wherein it used to charge high port charges purportedly for international carriage whereas the same port was also used to route the domestic traffic between one ISP and another one.

Business Model

ISP members pay port charges to NIXI depending on the capacity besides initial set up and sign up cost to defray its cost of manpower, equipment and rental, etc. NIXI has multiple nodes across the country even as much of the traffic exchange happens in the metro nodes located in Delhi NCR, Mumbai, Chennai and Kolkata.

Earlier, NIXI also used to act as a clearing and settlement body when an ISP 'A' was obliged to pay to NIXI an amount of 'n' (=X-Y) if it was receiving 'X' GB and sending 'Y' GB while the ISP 'B' would receive the same amount from NIXI. Effectively, it was a zero sum game facilitated by NIXI. This practice has since ceased to be in operation.

NIXI itself is not an ISP and hence, does not compete with the ISP members.

Much of the NIXI revenue and profit is now on account of ccTLD business. However, this note is restricted to the IXP (Internet Exchange Point) business only.

Governance

Board of Directors Chair of NIXI's board is nominated by the government while others are elected by NIXI's membership. It is notable that the membership and hence, the voting rights vest only with the founding members and the service providers connecting to IXP as mentioned in its Articles of Association at the time of incorporation; ccTLD registrars and affiliates for NIR do not have voting rights, since these were not even envisaged at the time of incorporation.

While the AoA can be amended, the power to do so also lies with the 'existing members' only who are loathe to support any move that dilutes their representation and power in the board. Government has chosen not to exercise its power of dissolution and recasting the AoA including reconstitution of the board with proportionate representation across entities of different types.

Thanks to its deep reserves, NIXI can payback the grant-in-aid even with interest from its reserves and thereby be free of government control and oversight. However, there is no such proposal under consideration.

Lessons

Government can catalyse an organisation like NIXI with seed money in the form of grant-in-aid. However, extremely restrictive membership norms can become self-limiting.

On the other hand, National Payment Corporation of India (NPCI), also a not-for-profit company, was incorporated with equal equity participation by ten banks (six public sector, two private sector and even two foreign banks!). While the government and the regulator (RBI) had a role in its initial set up, its board is independent and runs the company with an arm's length relationship with the government and the regulator.

Hence, the AI4AI Data Exchange platform should be neutral and not-for-profit entity, but supervised by an independent board and run by professionals even as the initial set up should be facilitated by the government, preferably through a grant-in-aid. The platform, in turn, should generate sufficient revenues from its operations so as to become self-sustainable thereafter.

References

1. TRAI Task Force Report on Growth of Internet in India, 2002
https://trai.gov.in/sites/default/files/9SEP1052012.pdf

2. TRAI's Consultation paper On Improvement in the Effectiveness of National Internet Exchange of India (NIXI), 2006

https://www.trai.gov.in/sites/default/files/Consultationpaper1nov06pdf.pdf

3. Comments to TRAI's Consultation Paper https://www.trai.gov.in/consultation-paper-improvement-effectiveness-national-internet-exchange-india-nixi

4. Sify's Response to TRAI Consultation Paper on NIXI, November 2006 https://www.trai.gov.in/sites/default/files/SIFY_01112006.pdf

5. TRAI recommendations dated 20 April 2007 https://www.trai.gov.in/sites/default/files/recomen20apr07.pdf and the letter to IT Secretary https://www.trai.gov.in/sites/default/files/DIT.pdf

6. NIXI's Articles of Association https://nixi.in/static/nixi_pdf/RTI/AOA.pdf

7. Excerpts from NIXI's Annual Report 2010-2011 https://nixi.in/static/nixi_pdf/RTI/Annual_Report_2010-11.pdf :

a) For the purpose of Establishment of Internet Exchange (IXP) in India NIXI, co-located at 4 Software Technology Parks of India (STPI) viz. Delhi, Mumbai, Chennai, Kolkata, the Government of India, the Ministry of Communication and Information Technology, Department of Information Technology (CCRBT Groups), Electronics Niketan, 6 CGO Complex, New Delhi -110003, had vide its letter dated 28.03.2003, granted its approval and conveyed the administrative approval for the implementation of the Project at a total estimated cost of Rs. 424.35 lacs and sanctioned a Grant-in-aid subject to the conditions stipulated therein.

b) Against the sanctioned grant, the Ministry released a sum of Rs. 350 lacs to STPI, New Delhi as first installment for implementation of the project by the Executive Board of NIXI, DIT New Delhi, which has been allocated in proportion of overall project cost.

Government Grants

The grant-in-aid received from Govt, of India, Ministry of Communications, have been segregated into capital and revenue grants based on the budgeted cost estimates provided to the concerned ministry and utilized for the purpose for which it is given. Grant, if any, remaining unutilized is shown under the head "Capital Fund".