

# Public Interest Technology

## Technology led policy making

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वन्दे मातरम्  
Reverential salutations, O Mother!

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# Introduction

Digital Technology is embedded everywhere in our lives today. The digital technology, just like nuclear technology, also has two sides, it can be utilized for good purposes or it may be misused. Since technology is integrated into the very fabric of economic and social lives of people, it has potential to provide competitive edge to a nation (national prosperity is created not inherited<sup>1</sup>) through policies that positively sustain and facilitate developmental objectives of the government, provide equitable opportunities to people and businesses and drive socioeconomic benefits for the citizens. Some estimates, for example, that the technology such as AI will play an important role and may provide up to 26% boost in GDP by 2030 for some local economies<sup>2</sup>. Technology provides rapid advancement, therefore technology centric policy decisions may see quick policy transmission impacts. Technology therefore is becoming essential element in the policy making and requires a serious consideration.

The “Public Interest Technology” is increasingly being recognized as an emerging field within the academic circle. Susan Crawford, a professor at Harvard Law School argues that traditional academic disciplines aren’t designed to help students study and apply technical expertise to advance the public interest consequently there is a need for intentional cross disciplinary education to train students and serve underequipped policymakers<sup>3</sup>. Bruce Schneier, an internationally renowned security technologist and a Lecturer in Public Policy at the Harvard Kennedy School, in the RSA 2019 conference<sup>4</sup> discussed a term for this domain that straddles technology and policy making. The “**Public Interest Technology**”<sup>5</sup> is an area that focuses on utilization of technology for public good, promote social justice and responsible usage of the technology. The policy makers are not technologists and they need help from domain experts to effectively develop tech led policy response.

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<sup>1</sup> The Competitive Advantage of Nations, HBR, Michael E. Porter, 1990, <https://hbr.org/1990/03/the-competitive-advantage-of-nations>

<sup>2</sup> Is AI the Next Frontier for National Competitive Advantage? Strategy and Business, Anand Rao, Jan 22, 2019 <https://www.strategy-business.com/blog/Is-AI-the-Next-Frontier-for-National-Competitive-Advantage?gko=9bfef>

<sup>3</sup> Why Universities need “Public Interest Technology” Courses , Susan Crawford, WIRED, 22 Aug 2018, <https://www.wired.com/story/universities-public-interest-technology-courses-programs/>

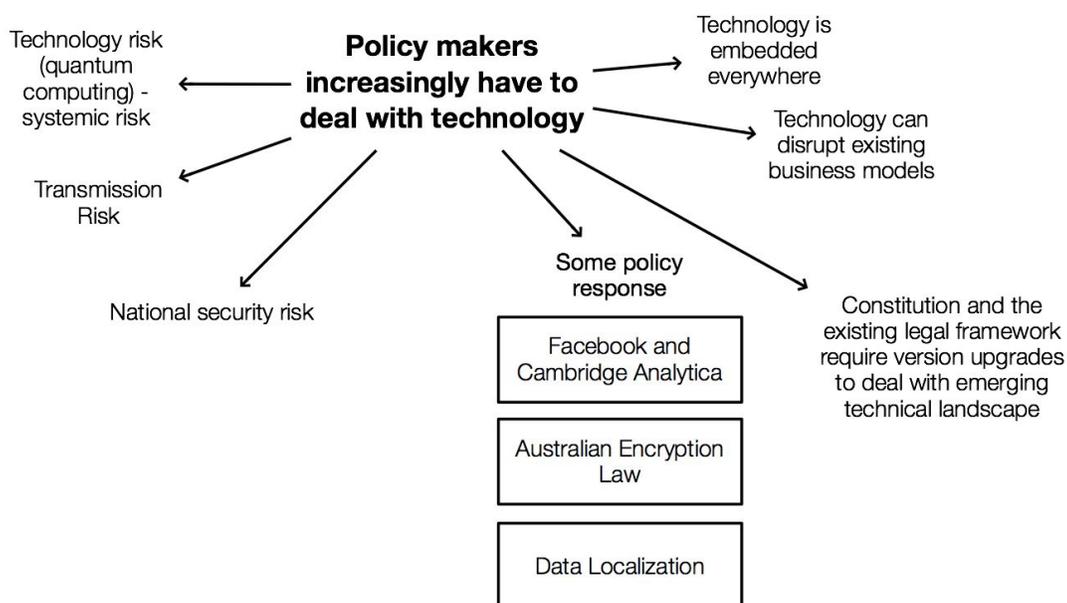
<sup>4</sup> Role of security technologists in public policy <https://www.rsaconference.com/videos/the-role-of-security-technologists-in-public-policy>

<sup>5</sup> Public Interest Technology website maintained by Bruce Schneier, <https://public-interest-tech.com>

## Definition of Public Interest Technologists

The Ford Foundation blog post<sup>6</sup> described public-interest technologists as “technology practitioners who focus on social justice, the common good, and/or the public interest.” A group of academics in this field wrote that “public-interest technology refers to the study and application of technology expertise to advance the public interest/generate public benefits/promote the public good.”

Many emerging technologies, sovereign, economic and social concerns, such as cryptocurrency, data sovereignty and localization, data privacy and rights of citizens, creation of right balance between state surveillance and public safety interests, emerging technology impacts on extant regulations require good background in technology and understanding of technology landscape to create sound policies. Dr Raghuram Rajan in his book “The Third Pillar” has argued that the ICT revolution have been transmitted across the world by increasingly integrated markets for goods, services, capital, and people and we are at a critical moment in human history, when wrong choices could derail human economic progress.



This whitepaper highlights some of the instances where technology plays a significant role in defining policy response.

<sup>6</sup> 5 Reasons You Might Be a Public Interest Technologist, Ford Foundation, <https://www.fordfoundation.org/ideas/equals-change-blog/posts/5-reasons-you-might-be-a-public-interest-technologist/>

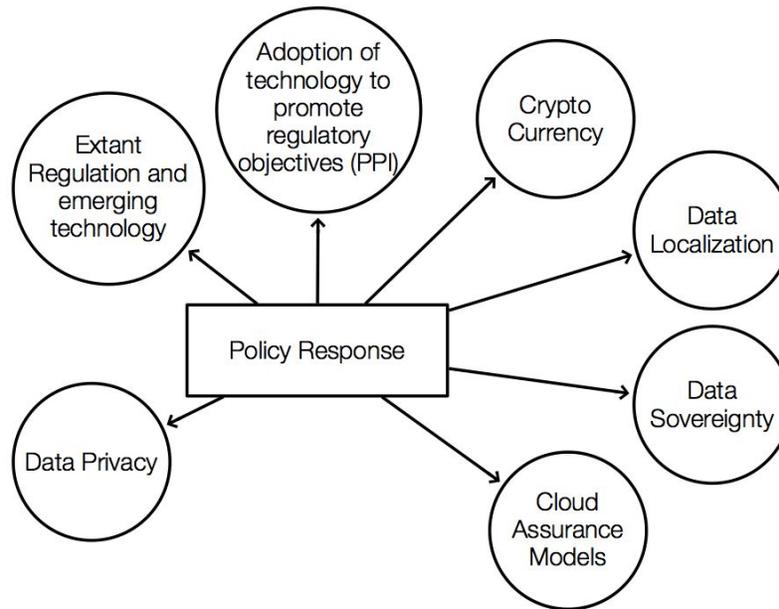
## Context

One of the policy response towards technology could be a passive regulatory approach, where the policy makers could expect the industry itself to find the right technology solution to meet specific needs of the market. While we could expect market competitiveness to foster innovation, the market may fail to find an optimal solution because of the existing market capture asymmetry which may prevent a fostering environment for new entrants. Furthermore the technology innovation itself may invoke a regulatory response for protection of citizens against harm or for nudging responsible use of the technology.

The technological advances are significantly reducing entry barriers for new players even in mature markets. Concepts such as bank in the box (BitB), born-in-the-cloud (BitC), mobile first approaches enables startups to offer services quickly, with agility and with minimal capital requirements. The API and standards driven approach has excellent implications for reducing system complexity and enforcing interoperability. The Open Banking PSD2 initiatives in Europe and America have been driven by intent to foster FinTech innovation for better service and products offerings. Many regulatory domain in the FinTech space, such as P2P, has a tech first business model. Thus there are new regulatory space emerging from this technology fist business models.

Use and dependence on technology generates risks. Technology can disrupt existing business models and potentially shift market dynamics. Because the technology enables interconnectedness it may generate transmission risk when its impact in one sector is felt in another. Furthermore the dependency on technology itself can generate risk from technology failures and obsolescence. For example the cryptographic risks from quantum computing that potentially can break the existing encryption mechanisms and render the extant encryption utilized on Internet ineffective may pose serious data security and privacy risks. Technology can also create national security risk, since critical infrastructure may be targeted by rouge state elements or criminals causing large scale disruption and in some cases even loss to people's lives.

In the last few years policy makers have had to deal with myriad of technological issues. The following diagram shows some of the technology areas that the policy makers have had to deal with in the recent times.



## Cryptocurrency

Currency tenders are issued, managed and backed by the governments and thus enjoy public trust. Through a transaction ordering mechanism in a distributed network, which solved the double spending problem, bitcoin removed the need for a central clearinghouse or a need for an intermediary trusted party.

Many expectantly looked up at Central Banks and their role and implications that cryptocurrencies will have on the financial systems. The decentralized nature of the solution creates interesting possibilities but also pose regulatory challenges. Many central banks have taken a wait and watch approach with the cryptocurrencies. Some central banks such as Russia and China have been looking at testbeds to establish central bank backed national cryptocurrencies. An inter-departmental group was setup to study the to study and provide guidance on the desirability and feasibility to introduce a central bank digital currency.<sup>7</sup>

There are several important considerations for the central banks when studying the digital cryptocurrency:

- Facilitate effective delivery of the government subsidies via cash disbursement in cryptocurrency
- Building resilience in the financial systems by enabling inter-bank transfers via cryptocurrency as an alternative to RTGS/NEFT
- Reducing the cash in the circulation and thus saving cost on the physical currency management
- Promoting interoperability between various different kinds of payment instruments

<sup>7</sup> Statement on Developmental and Regulatory Policies, RBI Press Release, 05 Apr 2018, [https://rbi.org.in/Scripts/BS\\_PressReleaseDisplay.aspx?prid=43574](https://rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=43574)

## Data Privacy

There have been significant development in data privacy with European Union coming out with GDPR regulations. Within India Justice SriKrishna Committee has put forth a draft data protection bill<sup>8</sup>. Traditionally, the US approach focuses on protecting the individual from excessive state regulation (fair information practices principles or FIPPS that was outlined in 1970 continues to be one of the foundational works in the area of data privacy ) The European Union model focuses on a right based approach, where protection of personal data is equated with protecting the fundamental right to privacy. While the interest in data privacy has invoked legislative actions, effective implementation of the data privacy also requires a technical consideration for enabling these privacy principles. When new systems such as Account Aggregator<sup>9</sup> or Public Credit Registry is designed we cannot be far from the consideration about data privacy. A system that is built with privacy by design principles and utilises “electronic consent”, such as the one that forms the underpinning of the Account Aggregator system would enable a system that may support both US and European Data Privacy objectives and will be resilient to the Indian Data Protection law when it gets enacted. Several other initiatives within India, such as the national health stack<sup>10</sup> (NHS) and IISc team working on Urban Data for Smart Cities<sup>11</sup> is further leveraging this “privacy by design principles” and “electronic consent framework”. Thus technology will continue to play a major role in this area.

## Data Localization and Data Sovereignty

The world has greatly benefited from the ICT revolution with major impact on poverty alleviation and improvements in standards of living across the world. In social media, debates around the data localisation has raised questions whether it is driven by a protectionist mindset. Some have also questioned whether there have been any research that backs this policy response. Every policy decisions may lead to some positive and some negative impacts. It is when the positive impacts far outweighs any shortcomings without impacting any minority sections, has the policy succeeded. Data localisation<sup>12</sup> is a technology area and impacts of such a policy on businesses has to be understood in context of not just geopolitical, but also within a technical framework. Policy response may be backed with technical research on topics such as this.

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<sup>8</sup> The Personal Data Protection Bill, 2018, MeITY, [https://meity.gov.in/writereaddata/files/Personal\\_Data\\_Protection\\_Bill,2018.pdf](https://meity.gov.in/writereaddata/files/Personal_Data_Protection_Bill,2018.pdf)

<sup>9</sup> Consent brokers: India's new data-sharing model can be a game-changer but has several loose ends, Factor Daily, 25 Mar 2019, <https://factordaily.com/consent-brokers-indias-new-data-sharing-model-can-be-a-game-changer-but-has-several-loose-ends/>

<sup>10</sup> National Health Stack, Strategy and Approach, Niti Aayog, July 2018, [http://niti.gov.in/writereaddata/files/document\\_publication/NHS-Strategy-and-Approach-Document-for-consultation.pdf](http://niti.gov.in/writereaddata/files/document_publication/NHS-Strategy-and-Approach-Document-for-consultation.pdf)

<sup>11</sup> The Indian Urban Data Exchange, An Overview of the Rationale, Architecture and Methodology, October 2018, <http://www.rbccps.org/wp-content/uploads/2018/12/The-Indian-Urban-Data-Exchange.pdf>

<sup>12</sup> Data localisation in India: Questioning the means and ends, NIPFP Working Paper, Sept 2018, [https://www.nipfp.org.in/media/medialibrary/2018/10/WP\\_2018\\_242.pdf](https://www.nipfp.org.in/media/medialibrary/2018/10/WP_2018_242.pdf)

## Extant regulation and emerging technologies

Technology can impact existing policy space. India has led the world in terms of financial security innovation and has successfully introduced appropriate controls like monitoring systems, multi-factor-authentication and SMS alerts, to mitigate cyber-fraud. In certain respects, this has strengthened the cybersecurity postures of the Indian financial sector and made it more resilient than most advanced nations. However, in process maturity, controls and infrastructure, there is still work to be done and the maturity in these areas will take some time. This has assumed special significance in light of Government of India's initiatives in digitisation of government services and promotion of electronic payments.

The financial industry has been seeing an increasing trend towards adoption of mobile computing platforms. Consequently, most banks today provide mobile applications and increasingly rely on the telecom infrastructure to deliver their services. The security of the banking transactions thus is dependent on the robustness of the underlying telecom infrastructure. Recent research has brought to notice some trends, that highlight SS7 protocol vulnerabilities and suggest technical considerations to address these inherent system weaknesses in the telecom infrastructure so digital payment systems are resilient despite their dependencies on the underlying telecom infrastructure.

## Digital Payments Technologies

In India Cash to GDP ratio is close to 10.9%, which is quite high as compared to many developed and developing nations<sup>13</sup>. Cash is by far the most used payment means in the world, comprising of approximately 85% of the transactions and 60% by value. An HBR article reports that India ranks high in terms of costs associated with handling cash<sup>14</sup>. As per publication<sup>15</sup> by Tuft University and NIBM, the cost of handling cash in India is approximately ₹ 21,046 Crore. As per an analysis made by BCG survey and a report published by Dr. Malviya<sup>16</sup>, the channel usage in India sees heavy infrastructure intensive utilization. Branch and ATM utilization is at around 92% in India, whereas in the US, usage is only 36%.

The digital push by the government and RBI will have significant impact in the payment landscape in the next several years. The tokenization and PPI introduction present opportunities for new use cases and innovation in the payment channels such as mobile payments, wearables & NFC. Toll payments might see further innovation in

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<sup>13</sup> Cash still the king. Cash savings highest in a decade, Economic Times, Aug 30, 2018  
<https://economictimes.indiatimes.com/news/economy/finance/cash-still-the-king-cash-savings-highest-in-a-decade/articleshow/65598614.cms?from=mdr>

<sup>14</sup> The Countries That Would Profit Most from a Cashless World  
<https://hbr.org/2016/05/the-countries-that-would-profit-most-from-a-cashless-world>

<sup>15</sup> Tuft University and NIBM, The Cost of Cash in India,  
<http://fletcher.tufts.edu/~media/Fletcher/Microsites/Cost%20of%20Cash/COC-India-lowres.pdf>

<sup>16</sup> International Institute of Professional Studies, Devi Ahilya University, Indore, Mobile banking current status in India, Dr. Surendra Malviya <http://www.managejournal.com/download/100/2-5-23-300.pdf>

the RFID based payment channels. Development of new products, channels within this ecosystem needs to happen in a confidence inspiring environment. Technology providers, security professionals organization and standards setting bodies all will need to play a key role in this responsible development of the ecosystem.

## Other Technology Areas of Regulatory Interest

The policy making should look at regulatory mechanisms that improves the regulation and supervision process through automation. Business process automation that reduces human intervention will result in fewer errors and brings in efficiency which could facilitate continuous rather than in-point assessment of the regulated entities. The tech led policy making has to consider an expanded ecosystem beyond the isolated view of looking only at the regulated entities. The technology providers and vendor ecosystem plays an integral role in development of solutions that services the regulatory objectives.

- Utilization of technology in regulation and supervision
- Technology leadership as a competitive edge for the country
- Regulatory Sandbox
- Influence technology adoption
- AI and Ethics in technology

## Policy Intervention Modes

The “technology” as an enabler is creating new kind of business models, creating disruptions and changing market dynamics. There is a wave of innovation sweeping the world. There may be different types of planning approaches<sup>17</sup> policy makers may utilize to deal with the impact of technology.

- **Inactive**<sup>18</sup>: Inactive planning is an attempt to preserve the present, which is preferable to both the past and the future. While the present may have problems it is better than the past. The expectation is that things are as good as they are likely to get and the future will only be worse. Any additional change is likely to be for the worse and should therefore be avoided.
- **Passive**: A passive approach is to let the market forces shape the development without any need for a policy intervention.
- **Reactive**: When a technology development starts to show impact on a policy domain, a policy response to the emerging risk needs to be articulated to ensure that general harm to public is prevented and there is a responsible use of the technology. Since the technology innovation is happening at a rapid pace,

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<sup>17</sup> The social professions and social policy: Proactive or reactive? European Journal of Social Work, Sarah Banks, 2008 <http://dx.doi.org/10.1080/13691459908412199>

<sup>18</sup> Ackoff, R. (1981) Creating the Corporate Future: Plan or be Planned. John Wiley, New York.

the regulators and governments are increasingly being forced into a reactive approach to policy making.

- **Proactive:** Proactive planning involves designing a desired future and then inventing ways to create that future state. Not only is the future a preferred state, but the organization can actively control the outcome. Planners actively shape the future, rather than just trying to get ahead of events outside of their control. The predicted changes of the proactive planner are seen not as absolute constraints, but as obstacles that can be addressed and overcome. A proactive approach may see utilization of regulatory sandbox to determine policy interventions needs through experimentations within a controlled environment, for example to determine impact of a tech led new business model. Thus a Regulatory SandBox may support new market development.

## Policy Intervention Zones

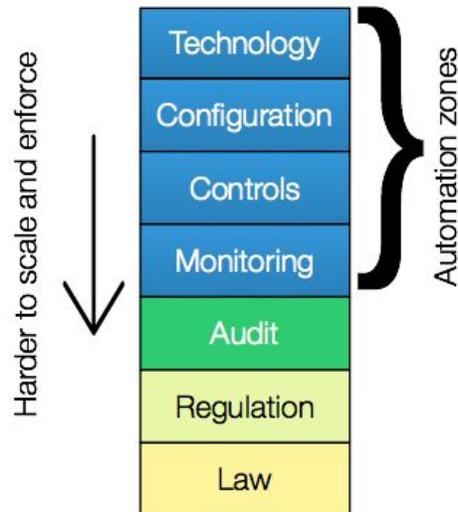
The policy intervention impact may happen at multiple levels. If a technology provides a solution it will ensure that the policy intervention is going to be most effective. If a tech led response is possible then it also ensures effective policy transmission and implementation. Examples of technology led approach to promote digital payments is the UPI platform, consent driven account information sharing on the Account Aggregator platform to enable FinTech innovation, API driven PCR for reducing information asymmetry and improve credit discipline. In US the health care exchange is also a technology led approach<sup>19</sup> to creating a marketplace for increasing competitiveness and for benefiting the general public.

Sometimes it is not possible to solve policy issues purely through technology intervention. The usage of technology may create policy risk and right configuration and processes may need to be instituted to ensure that policy objectives are met. For example, the SWIFT provides payment messaging protocols but also provides free format message types that was exploited in case of the PNB fraud. Clear articulations of what risks use of certain technology requires not just the knowledge of what it technologically possible, but also an understanding of domain and policy objectives. In this case, for example, disabling the use of a free format message types, setting up appropriate processes and controls that provide right check and balances might be an appropriate policy response.

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<sup>19</sup> Mobilizing Tech Talent, Sept 2018, [https://ourpublicservice.org/wp-content/uploads/2018/09/Mobilizing\\_Tech\\_Talent-2018.09.26.pdf](https://ourpublicservice.org/wp-content/uploads/2018/09/Mobilizing_Tech_Talent-2018.09.26.pdf)

## Intervention Zones



Technology not just can play important role in policy making, but it may also play important role in regulation and supervision processes. There is a possibility of leveraging technology to automate part of the policy intervention zones to ensure regulatory compliance.

## Standards Development and Policy Making

Development of ecosystem needs be happen in a confidence inspiring environment. Technology providers, security professionals organization and standards setting bodies all play key role in a responsible development of the ecosystem. In India, there is a need to bolster the standards development through specifically positioned standards development organization (SDO)<sup>20</sup>. The SDO provides a platform for development of voluntary standards through participatory and collaborative process. Technical standards development is essential for interoperability, security and efficiency of the overall ecosystem.

## Future of Public Interest Technology

While civil societies and public advocacy groups have existed for long time, they have generally been led by either policy advocates or law professionals. The translation of technology talk into policy domain requires specialized expertise. Technology world uses many abstract concepts and is very dynamic, consequently it requires deep domain expertise. However, it is hard to find technologist who might be interested in this domain, can straddle these two different fields and are sufficiently articulate. The “Public Interest Technology” area is new and awareness and acknowledgement amongst policy makers that technology is impacting and will continue to impact the policy making significantly is an initial step. The reactive approach should give way to

<sup>20</sup> Standards organization, [https://en.wikipedia.org/wiki/Standards\\_organization](https://en.wikipedia.org/wiki/Standards_organization)

proactive approach that incorporates technical dialogues and seeks effective academic and business contributions. Technology should be thought about as an important element in all policy decisions that deal with regulatory space. Technology led policy decisions would generally straddle multiple regulatory domain, therefore a forum at an inter regulatory level for a continuous dialogue on impact of technology on emerging policy questions must be considered.

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Technology is now embedded deep into the business success. It has the potential to disrupt existing business models even in mature industries. Information technology, which was once a cost center, has now become a strategic business imperative. ReBIT's "Technology Landscape Briefs" are series of papers that touches upon specific technologies or use of technologies as they pertain to financial domain with a focus on "security".

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