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INNOVATION WITH INTEGRITY: BUILDING FUTURE-READY DIGITAL PUBLIC INFRASTRUCTURE

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Abstract: This paper explores the necessity of stewardship in ensuring that artificial intelligence (AI) technologies contribute positively to society. Drawing on India's innovative approach to building digital public infrastructure, this study examines how public digital systems like India Stack have transformed digital transactions, financial inclusion, and public services. It highlights the implications for global digital infrastructure, regulatory frameworks, and AI safety protocols, particularly concerning child safety in digital spaces.

INTRODUCTION

AI's societal impact is not inherently positive; it requires deliberate governance and stewardship to ensure its ethical and beneficial deployment. This paper presents India's model of creating public digital infrastructure to provide equitable access to digital services and examines how this framework can inform global AI governance.

Historical Context and Digital Infrastructure Analogy

A historical analogy may be drawn by comparing the U.S. road network's evolution from private toll roads to a public interstate system. 150 years ago, the US road road system was actually a collection of private toll roads and long journeys which required navigating several different toll roads were invariably expensive. It was a system that existed right up until 1956 when the realization that the existing system was neither good for society, nor business, inspired a major public works project. This shift facilitated both commerce and public welfare. Similarly, the global digital ecosystem today mirrors this same fragmented structure, dominated by private toll collectors controlling identity verification, data sharing, and payments. In 2009, in the face of rapid digitization, India was faced with a choice as to whether to accept a similarly fragmented structure or try something different, and accordingly, India implemented a public digital infrastructure to democratize access.

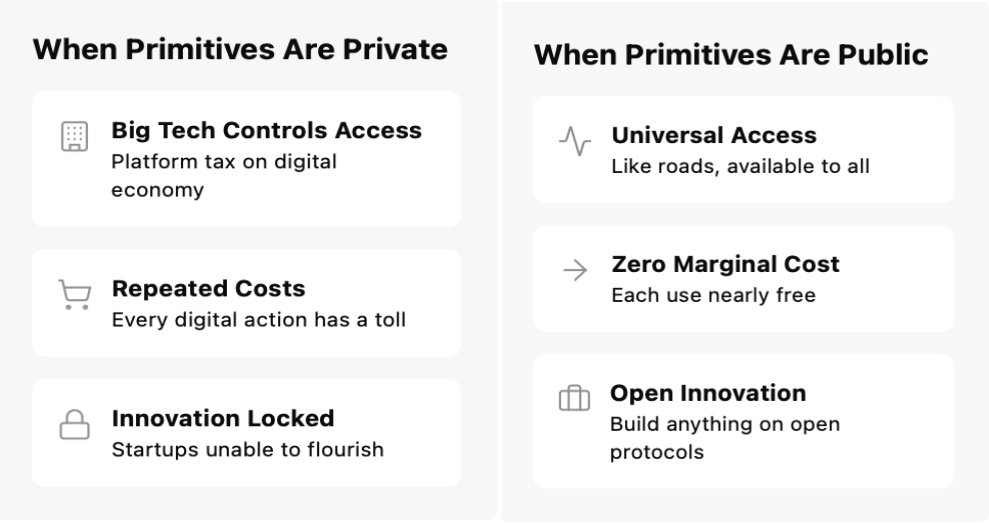

Figure 1: Every digital transaction needs the primitives of Identity, Payments and Data

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The India Stack: Foundation of Digital Public Infrastructure

In response to the need for inclusive digital growth, India developed IndiaStack, a comprehensive digital infrastructure based on three building blocks in relation to identity, payments and sharing of personal data. As a consequence, digitization in India has proved very effective, particularly in the field of financial services and financial inclusion. From 2014 to the present, bank account ownership among Indian adults has risen from 17% to nearly 100%. India now surpasses the UK, China and Korea combined in digital payment transactions due to the cost-effective system now in place. The digitization of financial services has also formalized India's economy, significantly increasing tax revenue (from 8.2% to 17% of GDP). Public protocols have also enabled large-scale direct benefit transfers and micro-payment systems, fostering economic growth.

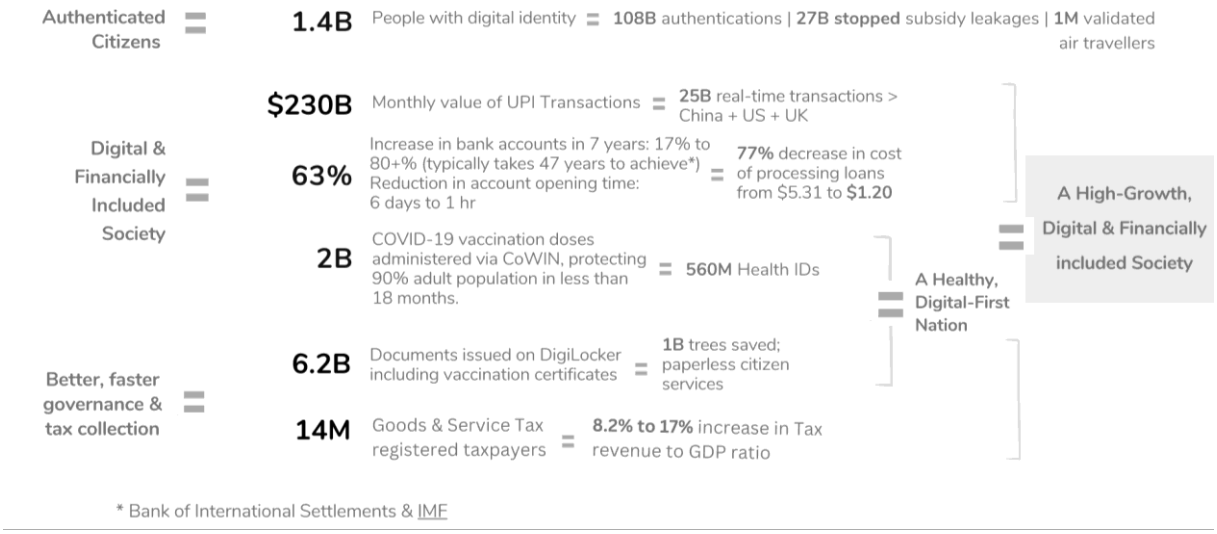

Figure 2: IndiaStack – How India became a digital first nation in under a decade

Public Protocols vs. Private Platforms

India's approach emphasizes public protocols over private platforms. Whilst such protocols decentralize and unbundle digital services, fostering innovation and resilience, they will always be resistance from those who stand to profit from a bundled approach. To take an example of the major payment providers across the globe, they will argue that services being bundled end to end will ensure greater reliability and convenience through a faster operational performance. The argument continues that if you break up these bundles into a distributed system that is tied together by a public protocol, then such a system will underperform in comparison to a tightly bundled system. India has nonetheless demonstrated that building high quality protocols can rival and surpass private platforms in performance and accessibility. A key to India’s success in this context is that wherever possible, it has built platforms. However, the reason the Indian payment system has worked so well is that instead of thinking of it as a platform, it is thought of as a protocol, which has led to it being more effective and more efficient than if the payment system was a platform. Whilst this is not a new idea, thinking protocols, rather than platforms, has allowed India to apply this approach to personal data and experiment with financial data and many other areas, including commerce and health. India’s startup ecosystem has also proved to be a success, with around 120 unicorns currently in existence, of which around 40%, are based on this approach.

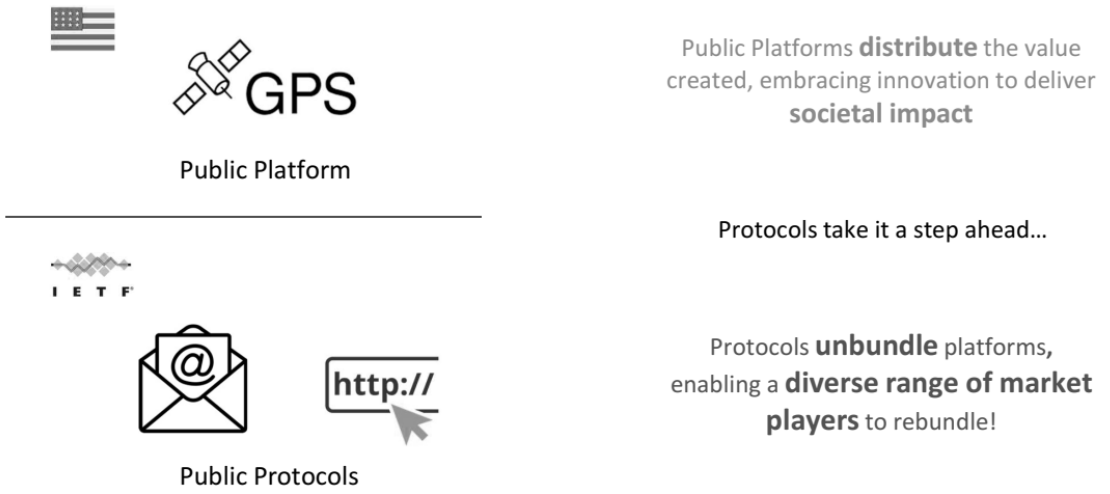

Figure 3: Public Platforms and Public Protocols

When something has been unbundled, markets will naturally begin to bundle it again and in such cases it is important to ensure that appropriate regulation exists to ensure that some ground rules are being followed and regulatory principles applied at the re-bundling stage, so these can help shape the ecosystem much better than would be the case if applied such regulation was applied only after the re-bundling has taken place. This is where public policy and public technology can come together to positively shape the behavior of the market. It is important to create digital public infrastructure, but it should be infused with the right principles, and those principles should be visible, easy to ascertain and observable. India holds the view that if you open the ecosystem, it enables the market to engage in combinatorial innovation, because real innovation happens in the market. The ultimate goal is to create an innovation ecosystem that would be healthy for society and would encourage innovation at population scale in India. Population scale in India would mean at least a billion people have to be served, but this is what is currently happening in the country.

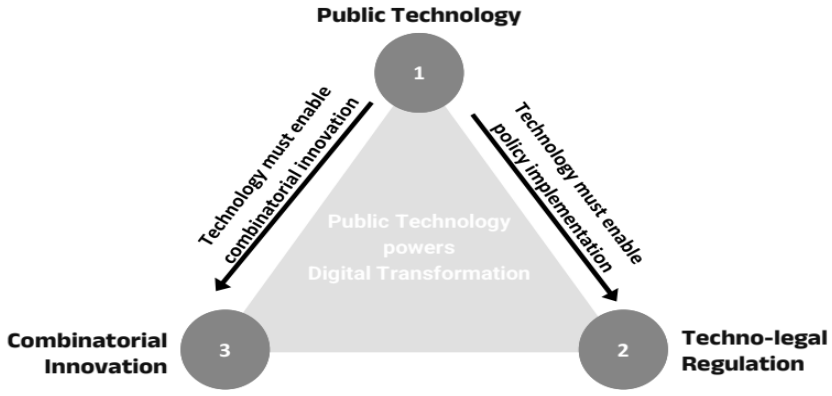

Figure 4: Public technology serves two masters

Global Implications and Collaborative Opportunities

Once the necessary building blocks are in place, systems can be built very quickly. In India, a prime example of this was the challenge during the Covid pandemic of vaccinating a population in access of a billion people. As a point of comparison, prior to pandemic, the country was only vaccinating 25 million babies a year in 40,000 vaccination

centres. During the pandemic, in a matter of weeks India was able to build a new system of vaccination where individuals traveled through the system using digital identity, vaccination centers got paid overnight using the digital payment system and everybody vaccinated received a digital certificate that was QR code enabled. The system facilitated 25 million vaccinations a week. This incredible improvement in productivity within a government system was the result of combinatorial innovation which allowed the system to be rapidly rebuilt.

Moreover, India's thinking in this landscape is to allow the rest of the world access to its public technology, which has seen many countries taking what is applicable to them and building their own regulatory frameworks on top, as naturally normative principles vary from country to another.

Figure 5: Principles that make a good Digital Public Infrastructure

Application of Public Infrastructure to AI Safety

Last year, 23 million babies were born in India – more than the total number of babies produced by the five next biggest countries on the list. India also presently has the largest population of young people under the age of 15 throughout the world and whilst there is no doubt that AI affords many opportunities for Indian youth, there are also risks and challenges in relation AI pornography, AI gambling, AI gaming, and many other distractions, that could potentially result in a lost generation. Developing AI safety protocols focused on content curation and child protection has become an important priority in India. Lessons have been learnt from what has not worked in other countries and this has guided India's approach to first of all unbundle the content from the curation. Social media typically bundles content and curation together, but India is attempting to separate these two things using a protocol approach. Such an approach is obviously not popular with big companies with vested interests, but with the help of other like-minded countries, India has focused on an approach that does not ban social media, but requires it to operate under new terms or behavior. In India, the protocol in place will allow parents to have the agency to decide what their children will consume. In other parts of the world, teachers and even the state will have a big role in this same context, but in India the approach requires that parents are the ones charged with the responsibility for decisions related to the internet consumption of their children. As India unbundles content and curation, the market once again re-bundles, but this time with normative principles being followed. India in this context is an experiment, but as with the other areas covered in this paper, the option for other countries around the world is still to adopt this public technology and build their own regulatory frameworks, alongside unleashing local combinatorial innovation to build population scale systems faster than ever before, creating more innovation, not just inside government services, but within

the startup ecosystem and the business ecosystem. This is a new way of thinking and perhaps there is a role for Vietnam joining India in the same unfolding revolution.

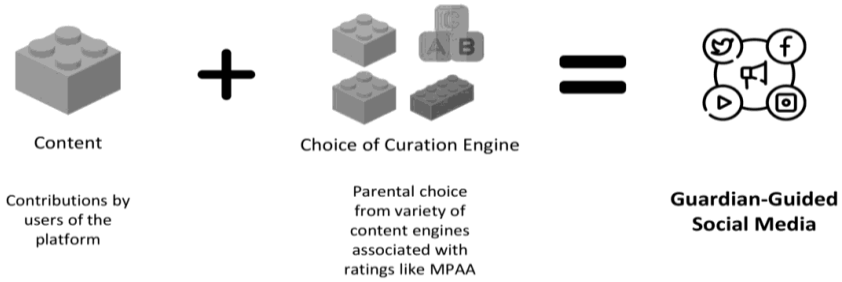

Figure 6: The AI Child Safety Protocol – Unbundling platforms and curation engine

CONCLUSION

Figure 7: A collaborative digital future

India's experiment with public digital infrastructure exemplifies how stewardship and proactive governance can democratize digital ecosystems and harness AI for social good. Nations worldwide are encouraged to adopt or adapt these strategies to create inclusive, resilient, and ethical digital economies.

This article is adapted from Mr. Sharad Sharma's presentation at the SIU Shaping Futures Conference –January 11, 2025.

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Sharad Sharma*

Tóm tắt: Bài viết này phân tích nhu cầu cấp thiết về quản trị và giám hộ để bảo đảm công nghệ trí tuệ nhân tạo (AI) đóng góp tích cực cho xã hội. Lấy cảm hứng từ mô hình xây dựng hạ tầng số công cộng của Ấn Độ, nghiên cứu trình bày cách các hệ thống kỹ thuật số như India Stack đã cách mạng hóa giao dịch điện tử, mở rộng khả năng tiếp cận tài chính và nâng cao hiệu quả dịch vụ công. Từ đó, bài viết chỉ ra những hàm ý đối với việc phát triển hạ tầng số toàn cầu, hoàn thiện khung pháp lý và thiết lập các giao thức an toàn AI, đặc biệt trong việc bảo vệ trẻ em trên môi trường số.

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