CSS | ISSUE BRIEF

Analysis of the India Artificial Intelligence Stack

India AI Stack should be an Umbrella Data storage center

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OVERVIEW

A lot has been said on the impact of Artificial Intelligence (AI) on geopolitics. India, in its AI Stack proposal, has reiterated that AI is going to be a major anchor for foreign policymaking. This article aims to provide a comprehensive analysis of the India AI Stack document released by Depart of Telecommunications on September 2, 2020. The released document aims to bring a procedural setup of the AI development enterprise. AI Standardization Committee, which developed the Stack document, said that "technological, economic and military supremacy can only be achieved with access to AI-related resources and the development of relevant AI solutions."[2]

India's AI Stack proposal makes AI a core attribute in enhancing the technological, economic, and military supremacy of the nation. This shows that the state of India considers AI to be the core element of defining power. India has ventured into the AI race when its national think tank, NITI Aayog first published a discussion paper on it in 2017. It has been 3 years, and we have seen the Ministry of Electronics and Information Technology launching AI-related committee reports and data protection law and recently a Raise AI summit. The significance of AI can be seen in terms of its predicted market value of US$ 26.4 billion by 2023.[3] In the introduction chapter, the document recognizes the USA, China, Canada, the UK, Germany, and France as having a head start in the geo-political race of AI.

This discussion paper has provided external references to the definitions which broadly accepts that AI is a machine program that can solve complex problems through the application of

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[2] AI Standardization Committee. 2020. *India Artificial Intelligence Stack.* Department of Telecommunications. https://tec.gov.in/pdf/Whatsnew/ARTIFICIAL%20INTELLIGENCE%20-%20INDIAN%20STACK.pdf.

[3] Ibid.

cognitive intelligence. In congruence with NITI Aayog's discussion paper released in 2017, it acknowledges a three-pronged approach to adopt AI into the national economy:

1. Undertaking proof of concept of AI projects
2. Craft AI Strategy
3. Collaborate with Experts

The document discusses the potential economic benefits of AI, its horizontal use cases, its role as the fundamental functionary in the fourth industrial revolution. The document also detailed the risk associated with AI. It includes the black box situation of AI algorithm, bias, data poisoning, ethics. The main contribution of the paper is the proposition of 'AI Stack' started only after 20 pages.

INDIA STACK

The draft proposes five main horizontal layers and one vertical layer. While the horizontal layers are infrastructure, storage, compute, application and data/information exchange, the vertical layer involves security and governance. The proposed India Stack promises to have local and secure data storage, open algorithmic access to the data; data storage with structured and unstructured data; secured gateway services; maintain ethical standards; compulsory consent from the customer and enforces the usage of Government Public Key Infrastructure (PKI) services. The five horizontal layers stack is a model for AI developers to follow. It can be understood as a governance model of AI by the state of India.

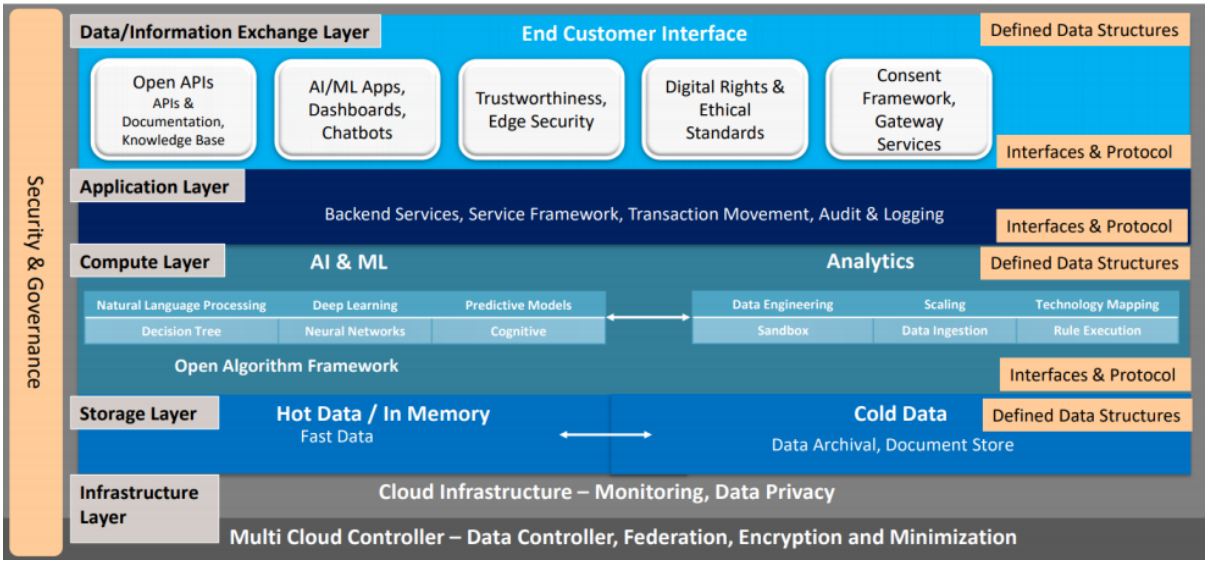

Figure I: A representation of AI stack (Source: India AI Stack Discussion Paper)

INFORMATION LAYER

This layer provides open API access and companies can test different user interfaces. It would have proper consent forms for the data providers. Here, all the users are considered as the data providers. Such consent can be for individual data or collective fields. Further, different tiers of consent are to be made available for the customers. This layer ensures that proper ethical standards and data laws are followed. The point to be noted in this section of the document is that, in the absence of National law, India Stack accepts to follow General Data Protection Regulation (GDPR) laws of the European Union. This aspect wrongly suggests that Indian digital laws would have their epistemological underpinnings from GDPR. GDPR has its foundations on the rights based data protection whereas Indian data protection bill is anchored to user-consent based framework. The information layer cannot protect privacy of the citizen, portability of the data to other countries as there are no elaborated legislations. If companies are to follow GDPR, there need to relevant supervising authorities, of which none exist currently. Even though the document mentions layered consent forms, there are no specifics about what constitutes layers.

APPLICATION LAYER

In this layer, software and applications can be hosted. It provides backend services for processing the data. Below are three major functions of this layer.

1. This is the platform to deploy the AI applications
2. It audits all the transactions as it keeps track of all transaction across the stack.
3. It provides backend services to AI applications.

COMPUTE LAYER:

The functioning of AI algorithms happens in this layer. The algorithm is stacked here. This means that the core of the AI system is defined in this layer.

INFRASTRUCTURE LAYER

India plans to host the citizen's data on the government server so that it could ensure data protection and rights. AI applications shall take the data sets from the provided services. There would be both public and private data banks, which provides security for the data firms.

STORAGE LAYER:

It has a proper format for the storage and accessing of the data. Data has three categories hot-data, which is accessed frequently; cold-data, which is accessed less frequently; and warm-data, which is the one in between the hot and cold data.

CONCLUSION

These layers are meant to streamline proper governance of AI systems. AI Stack is a specific design enabling easy process for AI development. Through the defined layers, roles of developers, auditors, and managers can be assigned clearly. Both the government agencies and the development firms can operate on a single defined AI development structure. Public comments for this discussion paper were accepted till November 2nd, 2020. The final version of this AI stack is awaited. However, the initiatives like National Urban Digital Mission and Indian Urban Data Exchange also appear to have similar thought process on data generation. They are thought to be an innovative initiative to bring citizen participation in urban governance.[4] They can even become a part of the AI Stack.

While the discussion paper allowed firms to follow European GDPR in the matter where Indian legislations are absent, it must be noted that the epistemology of the codification for Europe is different to India's. In India there are no consent withdrawal methods, processing of data which reveals political inclinations, trade union memberships, genetic data, data about religious beliefs are not prohibited in India. Though they are strictly prohibited by GDPR, in India such data processing continues. Further, GDPR is based on privacy protection, but Indian data

[4] Aijaz, Rumi. 2021. "Digital reforms in urban India." *ORF*. April 6. Accessed April 11, 2021. https://www.orfonline.org/expert-speak/digital-reforms-in-urban-india.

protection bill is focused on user consent.[5] When there are fundamental differences in the approaches of both the countries, asking companies to use GDPR in the absence of data legislations must be put under scrutiny. The proposed Stack would be better governed and offer better data security if it is designed in accordance with Indian data legislations.

Further, data storage is yet to be debated in India. Keeping aside the debate of server locations, it would be dangerous if each utility in the department has its data initiatives. Technically, all the data sets created would be stacked under an umbrella platform where the API access will be able to scrap all the open data in one place. However, there has not been any visible development in this aspect. In the Raisina dialogue report of 2019, it is pointed out that the legislation is not moving on par with technological advancement.[6] Digital technologies are not stand-alone technologies. A breakthrough in one technology would bring a revolutionary change in another sector. For example, AI development brings a change in medicine, governance, and politics. Thus, AI Stack if developed, it can be expected to be an umbrella data center not just for AI development but other sectors as well.

[5] Burman, Anirudh. March 2020. "Will India's Proposed Data Protection Law Protect Privacy and Promote Growth?" *carnegieendowment.* https://carnegieendowment.org/files/Burman_Data_Privacy.pdf.

[6] Ray, Trisha. 2021. "Innovation Capital: Ideas for Industrialisation 4.0." *ORF.* April 7. Accessed April 11, 2021. https://www.orfonline.org/expert-speak/innovation-capital-ideas-for-industrialisation-4-0/.

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