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A Survey on Big Data Analytics Framework for Digital Government

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ABSTRACT: Digital transformation has increasingly turned into a major point of concern for governments around the globe. Governments are seeking creative and effective digital solutions in accordance with political, socioeconomic, and technological workload pressure. This paper survey's framework that formalizes the government system-wide digital transformation process and progresses, standardizes infrastructure architecture, industrial change, and cultural with human resource development, data handling, data management, data governance, and data exchange protocols in a trusted as well as regulated environment, moving towards effective and sustainable utilization of big data analytics in policy-making and creation of digital innovations. To improve practicality, the paper also discusses some specific customizations of the framework along with adoption progress.

KEYWORDS: Digital government, Digital transformation, Big data analytics, framework, Data governance, regulated environment.

I. INTRODUCTION

Governments around the globe are getting increasingly conscious of the need to advance and innovate digital solutions at all times based on socioeconomic, political, or technological workload pressures. Not much less essential than digital solutions are the data and Data analytics that drive the formula of these solutions. With analytical and well-designed usage of Big Data technologies, a central authority present process the digital transformation manner can develop into a smart, sensible, and open government: one that adds constructive public facilities and that provides effective public services and a competitive edge to its industries while handling government resources efficiently and transparently. This paper presents the Big Data Analytics Framework for a government as a central authority to digitally transform effectively. The framework contains seven functional components, some of which can be developed simultaneously: Infrastructure, Human resource development, Data governance, Data archive, Data exchange, legal guidelines and laws, and smart and open government. while the framework is mainly designed for and can be adopted by governments around the globe, we can generalize the models and function ideas as plenty as feasible while providing proof of the framework's practicality by discussing acceptance progress by the government.

The framework aim's to: formalize the digital transformation program, standardize infrastructure architecture, Cultural and Industrial change with Human resource development, Data management, Data governance, and Data exchange protocols among government agencies in a trusted and regulated environment, and advance toward effective usage of Big Data analytics in policymaking and introduction of digital concepts.

II. RELATED WORK

In [1] authors present a framework that formalizes the government-wide digital transformation process, standardizes infrastructure architecture, cultural and industrial change with human resource development, data management and data governance, and data exchange protocols in a trusted and regulated environment, leading towards effective and sustainable utilization of big data analytics in policymaking and creation of digital innovations.[2] The development of government archives is inseparable from digital construction; Relying on OCR technology, the text items of government archives can be automatically input by computer to accelerate the process of digital transformation. In

solution to the four problems faced by the office, archives work in the process of digital transformation, office units can cultivate data thinking, improve the system, build a digital platform, optimize infrastructure construction and refine standard cultivation “Digitization + archives management” in order to keep the pace while achieving digital transformation. In [3]The study is based on filling the gaps between E-Government and the digital divide by utilizing the multi-channel services governed by transformational leaders. It state’s that purpose of electronic government is to use Information and communication technologies in the government sector, combined with organizational change and new skills to improve government sector service delivery, democratic processes, and capacity building, Data gathered through questionnaires has shown that transformational leaders along with digital channels have put a positive effect in switching from manual to electronic government processes. These aspects have increased the transparency, efficiency, accountability, and security in government processes. This [4] paper analyzes the characteristics of the E-government system and points out its security threats. this paper lays out a framework for an E-government security system based on the user role certificates. In the end, the implementation model based on web service is described in detail. In [5], paper points out the lessons learned from the various case studies of Digital Twin in Japan on building an AI government and smarter city for a resilient society. Paper suggests that Indonesia had better work with Japan toward the establishing smarter AI digital government utilizing DX technology such as AI.

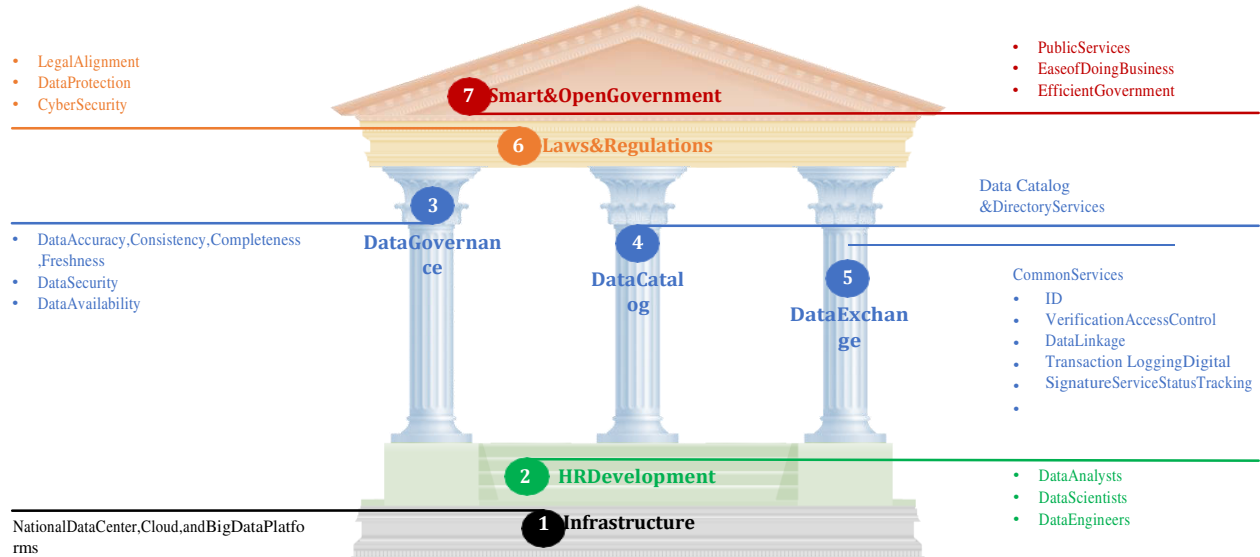
The authors in [6] visions a paradigm shift in public services by digitizing 100% of government services, vision is about sustainable development across society and strategies are presented for platform, open data, and human resource training. Specifically, improvements are being made to infrastructure, human resources expansion, ecosystems and public services. This paper studies infrastructure and digital capabilities of Uzbekistan, to reach a advanced level of digitization, country needs to implement its policies regarding digital government by 2025, aiming to optimize the governance and administration, to create a transparent nation and a paperless government and to be processed anywhere without visiting the government office. Paper aims to realize the goal of providing multi-channel public service to individuals and companies as entry into one of advanced countries and a hub of e-commerce based on digital economy. In [7], authors discuss about public administration in Indonesia and many issues like low transparency, inefficient bureaucracies, corruption; hence the requirement for E-government.this paper has described and analyzed digital transformation in Indonesiathrough e-government implementation and its impact on value added, agility and control, accountability and collaboration within the context of public service improvement. This paper used literature research methodology to identify and analyzed various e-government implementation. The results showed that the implementation of e-government that have been carried out so far had positive effects on public services. Some e-government applications covering Government to Citizen (G2C), Government to Business (G2B), and Government to Government (G2G) are presented as results of the transformation.

In [8] authors are centering government-communication strategy in St Petersburg as a global city,global cityis considered desired and beneficial bringing much needed sustainable development in digital society. Paper focuses on essential characteristics of thepublic-government relations in St Petersburg with three methods: experts' interview,opinion poll, document analysis.[9] discusses optimizing china’s digital government construction, including issues like information islands, data security, trace formalism. aims to understand the current status of China's digital government, analyze the challenges faced in the construction of digital government, and further propose optimization paths.

III. METHODOLOGY

As we saw earlier government all over the world are dependent on data to regulate and monitor every sector for the smooth transition into our future. Does the data framework for the digital government organisation is broadly divided into 7 parts:

Infrastructure, HR development, data governance, data catalogue, data exchange, law and regulation, smart and open government.



The need of the hour is to develop an integrated platform or a framework which provides the government bodies to function smoothly within the different departments. The main concern of the framework like this is to regulate the big data generated every second. There should be also a robust security layer. In India data reforms like it act 2000 has provided educate guidelines for the data protection, also recent reforms in 2019 bill of the personal data protection was passed which enhance the data protection and established a data protection authority in India. There are various custom big data frameworks which are already been used by the government which are Apache and Hadoop. But there is a need to develop and indigenous big data related frameworks for government to transition into digital era.

The initiative must be taken across the globe to enhance this Trend towards moving various government bodies into digital era. Countries like us and European Union have develop d technology like NIST big data framework which is an in house custom framework used by US government. The framework mainly focuses on the interoperability within different departments.

.. Where should be a robot infrastructure whereas like a national grade which provides the electricity throughout the country, thus there should also be a data warehouse, storage and distribution system. The initial cost of this infrastructure may be very high but will improve the governments and help government to make and more precise decisions which will indeed lead us towards better future.

.. The big data need in digital government is a broader topic to cover as per different government department needs different use case of the big data there should be a centralise method whereas the big data is kept in a central repository and the end product of the data analytics is been shirt throughout the departments. These will ensure a security layer government to centralise and regulate the data law.

.. Government decisions must be taken on the predictiveness of the data results does improving the governments and removing the bias within the government. This is also hell the government to take bold step regarding the future of the country which will provide a hard rock for the decision making for various sensitive issues.

.. Government also should provide the overall data regulation laws and acts which should be clear and prevent any loopholes in future. Government should also take initiative to improve the framework through the time.

Government also need to build an in house cloud service providing system to ensure that the security and the independence of the working of the structure is maintained. With this comes a great challenge which is the expertise in information and technology, this can be overcome by hiring a company or developing the framework in collaboration with other countries. Also there must be a rock solid life cycle followed by every department does ensuring the compatibility and bandwidth throughout the system. There is also need to develop a user interface which is simple yet

powerful enough to guide through the platform. Companies like Meta and alphabet have tremendous data all over the user spectrum this can be a boon as well as a curse. The data linkage of the government platform to the database is also an essential weak point which needs additional encryption level.

Government all over the world can take initiative to together develop a digital data framework for efficient and friction free working of the government.

IV. CONCLUSION

In this paper, we have surveyed the huge records Data Analytics Framework for Digital government that formalizes the Digital transformation method. We advise customized models and protocols for implementation of the framework while offering the progress of active framework adoption. As the framework is designed based totally on beyond successful digital government models, standards, and architecture, while emphasizing human resource improvement, and laws and policies, we are assured that the framework is strong in riding a central authority closer to smart and open authorities that may withstand social, monetary, political, and technological pressures to come back. This paper successfully surveys the framework that formalizes and progresses the government's system-wide digital transformation process, standardizing infrastructure architecture, industrial change, and cultural with human resource development, data handling, data management, data governance, and data governance.

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