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A Semantic Study On Nine Pillars Of Digital India For A Digitally Empowered Society And Knowledge Economy: Progress, Ranking And Initiatives

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ABSTRACT

Worldwide Information Communication Technology (ICT) has revolutionized the global society as well as transformed the technological environment. ICT plays a vital role in advancing economic growth with direct impacts on productivity, cost effectiveness and competitiveness in industries and business. It has made significant impacts on governance, promotion of business, spread of literacy, delivery of health services and rural development. Following the emergence of ICT driven " Digital Society" or "knowledge Economy", the competitive advantage is derived by using the competency in the application of knowledge rather than relying on abundant natural resources or cheap labour. Developing countries like India, therefore, can no longer sustain their development programmes based on demographic advantage and cheap labour force.

"It has become appallingly obvious that our technology has exceeded our humanity" - Albert Einstein

Contemporary discourses on development consistently identify ICT as a prerequisite for socio-economic development. Scholarly reports of UNDP, World Bank, WSIS Harvard University etc acknowledge ICT as a key development input to realize potentials for exponential and diversified growth. It has been understood the importance of digitalization for developing countries for improving efficiency in public administration and business, enhancing industrial productivity, and promoting competitiveness in trade and commerce in the present competitive era.

Despite the potentials for impacting almost all aspects of development, many researchers have identified four major areas having great potential for application of digitalization to expedite economic development:

- growth and productivity
- trade in goods and services
- investment and public funding and
- contribution to job creation

Apart from direct contribution to GDP growth, Digital India services have opened huge opportunities for employment in the domestic as well as global markets. India has emerged to recognizable position in global economy and achieved significant progress in several socio-economic sectors, particularly in the areas of education, sanitation, healthcare, women's empowerment, healthcare, export -oriented apparel industry etc.

Keywords: Digitalization, Digital Society, Digital Strategy, E-governance, Rural, Economy, Development , Behavior, Initiatives.

INTRODUCTION

The waves of acceptance and usage of ICTs (Information and Communication Technologies) have revolutionized India by introducing cutting edge technologies, enabling services in every sphere of our lives. There are numerous applications of ICT, digitization is one of them. Digitization is a process of converting the diverse forms of information, such as text, sound, image or voice into digitalized format. The digitization has impacted our economy and society by reducing unemployment, improving quality of life, and boosting access to knowledge and other

public services. The process of digitization has enabled all the countries under one roof for the accessibility of information and minimize the cost and increased the affordability and accessibility in short span of time.

Since inception of digitalization, it has undergone difference phases (wave) by the massive adoption of digital technologies. Each digitization wave has a specific set of social and economic impacts. Computing, broadband and mobile telephony networks have been instrumental in relaxing industry scalability constraints, thereby allowing traditional sectors of the economy to grow more rapidly.
Finally, the first wave appears to have had an impact on the growth of household income, and the facilitation of social inclusion (access to information, government services, and entertainment content.

The second wave of digitalization has led to the introduction of new services and applications such as Internet information searches, electronic commerce, distance education and a whole range of collaborative businesses that characterize the digital economy (Uber, airbnb, etc.). This "innovation effect" has yielded enhanced demand for labor in certain occupations linked to the development of digital services or the emergence of collaborative business models, coupled with the disappearance of repetitive low and middle-skilled jobs resulting from task automation.

The third wave of digitization involve the adoption of a range of advanced technologies, such as big data/analytics, Internet of Things, robotics, sensors, and artificial intelligence, and is aimed at enhancing information processing and the quality of decision making, while further automating routine tasks within business enterprises and governments. These technologies are not typically adopted in a stand-alone fashion but are integrated with the mature technologies characteristic of the first and second waves.

Moving forward digital transformation resulting from all three waves of digitization is so all-encompassing that sector-specific strategies developed within institutional silos are not applicable anymore. Governments need to build cross-institutional links fostering the collaboration among education, ICT, industrial promotion, science and technology to devise and jointly implement policies.

Moreover, the futuristic public policy scope should be expandable beyond traditional domains such as taxation, competition, and digital literacy to include new areas such as cyber security, privacy protection, and the fostering of digital adoption such as trust and enhanced customer experience Although this cross matrix is not easy but an effort should be made to keep the interest of people.

Technological Innovation	Development	Adoption	Social and Economic Impact
Computers, Brodband, Mobile Telecommunications	1950 - 1975	1960 - 2000	1990 - 2010
Internet platform, Cloud Computing	1970 - 1990	1995 - ongoing	2005 - ongoing
Internet of Things, Robotics, Artifical Intelligence, Machine Learning	1980 - ongoing	2010 - ongoing	2020 - ongoing
Statististics sourced from World Industrial Robotics 2016			

As per reports and articles from various author, it has been understood that the first wave of digitization has yielded significant social and economic benefits, coupled with very limited disruptions in labor markets restricted to labor intensive sectors. Secondly, the second wave of digitization has, so far resulted in increased business efficiencies, coupled with job destruction in low-skilled categories (although it is likely that this trend will accelerate once firms accelerate the accumulation of intangible capital and they become more adept at substituting capital for labor).Research on the third wave of digitization, linked to innovations such as robotics, 3D printing, machine learning, and big data among others, is still at its infancy. There is research that posits that automation of repetitive tasks, linked to robotics, and combined with enhanced power of technology in areas such as artificial intelligence and speech recognition, is linked to the disappearance of jobs. On the other hand, other researchers consider that not all jobs can be replaced by automation and that second-order job creation derived from either innovation and/or increased productivity and spending can cancel out any disruption effects.

Major significance of ICT can be coined as digitization of knowledge i.e., to convert the printed information in the digital form and made available for use with the help of computer networks. This has changed the whole world – DIGITAL WORLD.

The definition of digitalization has evolved with time; in today's digital society, all knowledge is divided into two binary strings, 0s and 1s that codified the data to run the applications and revolutionaries.

Witten and David (2003) define Digitization as, "the process of taking traditional library materials that are in form of books and papers and converting them to the electronic form where they can be stored and manipulated by a computer".

The US Institute of Museum and Library Services (IMLS) defines digitization as "the process of converting, creating, and maintaining books, art works, historical documents, photos, journal, etc. in electronic representation so they can be viewed via computers and other devices".

According to Pearce-Moses (2005) "Digitization is the process of transforming analog material into binary electronic (digital) form, especially for storage and use in a computer‖. Digitization converts materials from analog formats that can be read by people to a digital format that can be read only by machines. The devices like scanner, cameras, and several other devices can be used to digitize knowledge contents. These technologies allow the digitization of almost all types of materials, including paper documents, rare documents, photographs, sound recordings, and motion pictures".

According to our prime minister Narender Modi, "Technology transforms people's lives. It empowers and connects. From mitigating poverty to simplifying processes, ending corruption to providing better services, validity of technology is everywhere. It is important instrument for human progress. Our prime minister revolutionizes our legacy Information and Communication Technology (ICTs engine dated 1990s) with new vision, new milestone with defined objectives and strategy to achieve in stipulated time frame. And launched an ambitious umbrella programme on July 2015, with the aim to develop India into a knowledge economy and a digital empowered society to bridge the gap between the digital haves and have-nots by using technology for the citizens. And evolved the movement called – **Digital India** .
IT (India today) + IT (Information Technology) = IT (India Tomorrow).

The Digital India has potential to rapidly transform the lives of people on the margins and touch the lives of the weakest, farthest and the poorest citizen of India as also change the way our nation will live and work

OBJECTIVES OF THE STUDY

A conceptual study has been carried out to understand the significant aspects of nine pillars of digital India for a digitally empowered society and knowledge economy.

RESEARCH METHODOLOGY:

The Secondary data is collected from various published sources such as books, journals, newspapers, websites etc. to analyze and study the nine pillars of digital India for the progress, global ranking and effectiveness of initiatives.

LITERATURE REVIEW

A study conducted on government of India website (Paramjit, Prabhjeet 2010) to investigate the functioning of the Indian Government department and impact on the digital society. With the advent of Internet and Information and Communication Technology (ICT), it has become essential for every government body to host a website. By having a website, a government body can have maximum impact over many people employing minimum resources and time. Therefore, it is indispensable for the government to host an impactful website of their own. Apart from this, a website allows a government body to bring all its information together, even if its sub-bodies are placed at geographically dispersed places. Thus, inclusion of ICT within government bodies can bring about development of government itself

Leonidas Anthopoulos and Panos Fitsilis (2013) conducted research on techniques for smart city viability realization and suggest a domain that attracts an increasing scientific, political and economic attention. However, this domain is still confusing, since various parties define or apply alternative perspectives. Scientists document a technological smart city evolution from a website form to modern ubiquitous and eco-friendly ones; city networks describe this phenomenon more likely as a measurement system for intelligence in urban areas; business sector recognizes smart cities as "application boxes" for information technologies etc.

A framework for unified digital government – A case of India Article (Velamal Ranga Rao 2013) investigate the government needs to ensure the use of a common platform across different initiatives, as this may help integrate different functionalities (Horizontal and Vertical) to avoid duplicities. Hence framework for a Unified Digital

Government (UGD) was urgently required to have single view of the Government, Employees, Citizens and Business. The objective of this paper is to study the current scenario and need for common and core applications for e-Government and proposed a framework for a UGD. This was integrated solution architecture covering all functional areas and activities of the government under one roof. This paper explores how to improve access to government Common and Core services through better use of the ICT at any government level such as National, State and Local.

Christopher Bones and James Hammersley (2015) evaluated the Leading Digital Strategy: Driving Business Growth through Effective E-commerce. It has been highlighted that several organizational challenges in route to digitalization such as issues related to organizational health, culture, processes, talent, and customers. The authors highlight the need for organizations to develop a comprehensive digital strategy and re-engineer their business processes to leverage it.

Since digital strategy implementation is an emerging phenomenon with far reaching effects on an organization's performance, it is often handicapped due to lack of skilled and experienced talent who understand both technology and business. The authors suggest that organizations should develop talent from within. The authors stress that this will ensure availability of talent pipeline for continued digitalization and facilitate employee retention and engagement with the organization and dilemmas faced by organizations during digital strategy implementation.

Modern scientific literature defines digitalization as an integral component of the modern global economy which contributes to a more rational resource management (Antikainen et al., 2018), optimization of business management models (Rachinger et al., 2018) and structural changes (Heavin & Power, 2018). It also makes technological processes more complicated, accelerates innovation cycles (Latos et al., 2018) and improves supply chain management (Srai & Lorentz,2019). Digitalization leads to the internationalization of industries and startups (Neubert, 2018) as well as the creation of production ecosystems (Alcacer & Cruz-Machado, 2019). In banking, the speed of digitalization is unprecedented. This implies revolutionary changes in information processing systems of banks, qualification requirements and financial services (Carbo-Valverde, 2017). In the banking system model, operating cost is reduced and increased the productivity of financial services.

Digitalization has penetrated the socio-cultural sphere. There are two development scenarios for the music industry in the digital age (Bourreau et al., 2008): getting profit through selling content, which requires direct or indirect protection of music files, or through (almost) free distribution of content and sale of additional goods or services. We can say that digitalization negatively affects the music, publishing and cinema industry in connection with piracy and ignoring copyright on books, music, radio, television and cinema (Waldfogel et.al., 2017). On the other hand, digital technologies helped this sphere to reach new target groups. Thus, it expanded the audience of its consumers and reduced costs for introducing new products to the market of music, films, books and television.

A study on the impact of digital India by 2019 (Luvy, IJSER 2019) mentioned the Digital India programme and highlights and estimated the impact of digital India on Economic aspect , social aspect and environment aspect. A remark has been coined out that government can benchmark the recommendation of the Council on digital government strategies as entrusted in the OECD 2013 Ministerial Council Meeting while considering the agenda on " trust in Government: evidence, policies and decision making" at this stage of implementation of Digital India programme.

As study has been carried out to know the impact of 'Digital India' in 'Make in India' program (Ashutosh D. Gaur and Jasmin Padiya,2017) to investigate program in IT & BPM sector. They have stated that cities are becoming smart cities and governance is moving towards e governance. Digital literacy is an initiative for digital transformation. Government of India has announced its vision of zero import of IT hardware by 2020 of IT hardware with the increase in cashless transactions, we might see a surge in buying of IT hardware by consumers. This paper evaluates different trend and challenges for digital transformation in building blocks of digital India vision area : Infrastructure (High speed Internet, Digital Identity, Mobile and Bank linking, Cloud Storage, Safe Access) , Demand Based (Credential Cloud Based, Real Time Access, Integration, Business Ease, Secure Payments) and Empowerment (Digital Literacy, Digital Resources, Indian Languages, Digital Platform, Cloud Based) and a summarization of Nine Pillars of Digital India

Andrea ko, Peter Feher & Zoltan Szabo (2019) conducted a research on Digital Transformation – A Hungarian overview. The research aims to provide an overview of digital transformation in Hungarian companies from the dimensions of strategy, technology and digital innovation capabilities. They discussed the objectives of digital transformation and the role of IT departments in digital transformation. The research is part of an ongoing research, in which IT-related practice of Hungarian organizations is explored on a yearly basis, starting in 2009.

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AN OVERVIEW ON DIGITAL SOCIETY AND DIGITAL NATION

Digital innovations are reshaping our society, economy and industries with a scale and speed like never before. The notion of digital society reflects the results of the modern society in adopting and integrating information and communication technologies at home, work, education and recreation.
Mobile and cloud technologies, Big Data and the Internet of Things offer unimaginable opportunities, driving growth, improvement of citizens' lives and efficiency to many areas including health services, transportation, energy, agriculture, manufacturing, retail and public administration. They can also improve the governing process by helping policymakers take better decisions and engage citizens. The Internet has considerable potential to promote democracy, cultural diversity and human rights like the freedom of expression and freedom to information.

The Digital Nations or DN (previously the Digital 5, Digital 7 and Digital 9) is a collaborative network of the world's leading digital governments with a common goal of harnessing digital technology to improve citizens' lives. Members share world-class digital practices, collaborate to solve common problems, identify improvements to digital services, and support and champion the group's growing digital economies. Through international cooperation, the DN aims to identify how digital government can provide the most benefit to citizens. The DN embodies mini lateral engagement, where small groups of states cooperate on specific topics with a global impact.
Estonia, Israel, New Zealand, the Republic of Korea, and the United Kingdom are the founding members of the D5. In February 2018, Canada and Uruguay joined the group to form the D7. In November 2018, Mexico and Portugal joined to form the D9. The Denmark joined as the tenth member of Digital Nations in November 2019.Chairmanship of the DN rotates on an annual basis. The chair is responsible for hosting the annual Ministerial Summit. Recent chairs include New Zealand (2017), Israel (2018) and Uruguay (2019).

The following government departments lead their country's engagement with the Digital Nation.

- Treasury Board of Canada Secretariat
- Agency for Digitisation, Danish Ministry of Finance
- Ministry of Economic Affairs and Communications of the Republic of Estonia
- Ministry for Social Equality of the Government of Israel
- President's Office of the Government of Mexico
- Department of Internal Affairs of the Government of New Zealand
- Ministry of the Presidency and of Admin Modernisation of the Govt of Portugal
- Ministry of the Interior and Safety of the Government of the Republic of Korea
- Department for Digital, Culture, Media and Sport of the Govt. of the United Kingdom
- e-Government and ICT at the President's Office of the Govt. of Uruguay

In 2014, the founding members signed a charter committing to share and improve upon the participant nations' practices in digital services and digital economies. Updated to reflect a growing membership, the DN Charter outlines a mutual commitment to digital development and leadership through nine core principles:

- User needs – the design of public services for the citizen
- Open standards – a commitment to credible royalty-free open standards to promote interoperability
- Open source – future government systems, tradecraft, standards and manuals are created as open source and are shareable between members
- Open markets – in government procurement, create true competition for companies regardless of size. Encourage and support a start-up culture and promote growth through open markets
- Open government (transparency) – be a member of the Open Government Partnership and use open licenses to produce and consume open data
- Connectivity – enable an online population through comprehensive and high-quality digital infrastructure

- Digital skills and confidence – support children, young people and adults in developing digital competencies and skills
- Assisted digital – a commitment to support all its citizens to access digital services
- Commitment to share and learn – all members commit to work together to help solve each other's issues wherever they can

DIGITALIZATION PROGRESS AND GLOBAL RANKING

As per IMD World Digital Competitiveness Ranking 2019 (WDCR), India advanced four places to 44th position in 2019, with the biggest improvement in the technology sub-factor level, holding first position in telecommunications investment. To evaluate an economy, WDCR examines three factors: Knowledge, the capacity to understand and learn the new technologies; technology, the competence to develop new digital innovations; and future readiness, the preparedness for the coming developments. India rose from 48th place in 2018 to 44th rank in 2019 as the country has improved overall in all factors - knowledge, technology and future readiness.

The US was ranked as the **world's most digitally competitive economy**, followed by Singapore in the second place. Sweden was ranked third on the list, followed by Denmark and Switzer- land in the 4th and 5th place, respectively. Others in the list of top-10 most digitally competitive economy include Netherlands in the (6th) place, Finland (7th), Hong Kong (8th), Norway (9th) and Korea (10th).

The largest jump in the overall ranking was registered by China, moving from 30th to 22nd,and Indonesia, from 62nd to 56th."In the case of China, the improvement originated mainly in the knowledge factor (18th) in which it progressed in the training and education sub-factor (from
46th to 37th) and in scientific concentration (21st to 9th),"

Several Asian economies advanced significantly in the ranking compared to 2018. Hong Kong SAR (8th) and the Republic of Korea (10th) entered the top-10 for the first time, while Taiwan and China moved up to 13th and 22nd place, respectively. India and Indonesia jumped four and six positions, respectively, supported by positive results in talent, training and education as well as the enhancement of technological infrastructure.

The Ranking, produced by the IMD World Competitiveness Center, measures the capacity and readiness of 63 nations to adopt and explore digital technologies as a key driver for economic transformation in business, government and wider society.

NINE PILLARS OF DIGITAL INDIA

The concept of digital India is an initiative of Government of India to integrate the government departments and the people of India. It aims at ensuring that the government services are made available to citizens electronically by reducing paperwork. The initiative also includes plan to connect rural areas with high-speed internet networks.

Digital India has three core components. These include:

- The creation of digital infrastructure
- Delivering services digitally
- Digital literacy

For transparency and control on each initiative, entire programme is supported by 9 pillars as follows:

- Broadband Highways.
- Universal Access to Phones.
- Public Internet Access Programme.
- e-Governance – Reforming Government through Technology.
- e-Kranti – Electronic delivery of Services.
- Information for All.
- Electronics Manufacturing – Target NET ZERO Imports.
- IT for Jobs.
- Early Harvest Programmes

This will going be for preparing the India for the knowledge-based transformation and delivering good governance to citizens by synchronized and coordinated engagement with both Central Government and State Government.

This programme has been envisaged by Department of Electronics and Information Technology (Deity) and will impact ministry of communications & IT, ministry of rural. It is an inter-ministerial initiative where all ministries and departments shall offer their own services to the public Healthcare, Education, Judicial services etc. The Public- Private-Partnership model shall be adopted selectively. The major initiatives of the programme are E-Sign, Skill India, PMJDY (Pradhan Mantri Jan Dhan Yojana), JAM (Jandhan -Aadhaar- Mobile), E-Hospital, Wi-Fi Hotspots, DBT (Direct Benefit Transfer like MNREGA Payment, Old Age Pension, Scholarship), NOFN (National Optical Fiber Network), Smart Cities, Digital Locket. Digital India project is one among the top priority projects of government of India.

1. Broadband Highways:

Government aims to lay national optical fiber network in all 2.5 Lakh gram panchayats. Broadband for the rural will be laid by Dec 2021.The government aims to provide nationwide information infrastructure to connect all the remote areas, government departments, Universities , R&D etc.

2. Universal Access to Phones:

With Digital India initiatives, nation is ready to be well connected , efficient and more productive in all aspect. Mobile service technologies like 3G, 4G and upcoming 5G will bring the new revolution in speed and IoT.

3. Public Internet Access Programme:

It has two sub-components: Common Service Centers (CSCs) and Post office as Multi Service Centers Deity would be the nodal department to implement 2,50,000 CSCs operational at Gram Panchayat for delivery of government Services and 1,50,000 post office into multi-service centers.

4. E- Governance (Reforming Government through Technologies):

According to international organization, UNESCO, "Governance define the exercise of political, economic and administrative authority in the management of a country's affairs, including citizens' articulation of their interests and exercise of their legal rights and obligations. E-Governance optimize the performance of the governance via the electronic medium in order to facilitate an efficient, agile, , transparent and reduce black holes in the governance.
E-Governance has transformed all the manual work into fully automation system like online access to applications i.e. availability of all databases and information in electronic format.

5. E- KRANTI (National e-Governance Plan 2.0) :

The foundation of National e-Governance Plan was initiated in 2006. There were 31 Mission Mode Projects under National e-Governance Plan covering a wide range of domains, viz. agriculture, land records, health, education, passports, police, courts, municipalities, commercial taxes, treasuries etc. Considering the shortcomings in National e-Governance Plan that included lack of integration amongst Government applications and databases, low degree of government process reengineering, scope for leveraging emerging technologies like mobile, cloud…etc, Government of India reintroduce it with some of new features and initiatives and rebranded as e-Kranti with the vision of “Transforming e- Governance for Transforming Governance”. The portfolio of Mission Mode Projects has increased from 31 to 44 MMPs.

6. INFORMATION FOR ALL:

The government prime objective is to make the governance system transparent and open access to government information and documents online. Government pro-actively engages through social media and web-based platform to inform citizens about MyGov.in and two-way communications between citizens and government and online messaging to citizens on special occasion / programmes. Everything is connected through virtual networks. Swift workflow and no delays due to wait in queues.

7. ELECTRONICS MANUFACTURING - TARGET NET ZERO IMPORTS:

This pillar / milestone is creating a huge base for electronics manufacturing in India with the aid of digital technologies and skills. The empowerment of manufacturing through the Internet of Things will enable intelligent workshops that demonstrate data driven operational excellence and decentralized production control system within and beyond the physical factory walls. The government is targeting net zero import by 2021, through various schemes such as taxation / incentives, economies of scale, skill development, government procurement etc.

8. IT FOR JOBS:

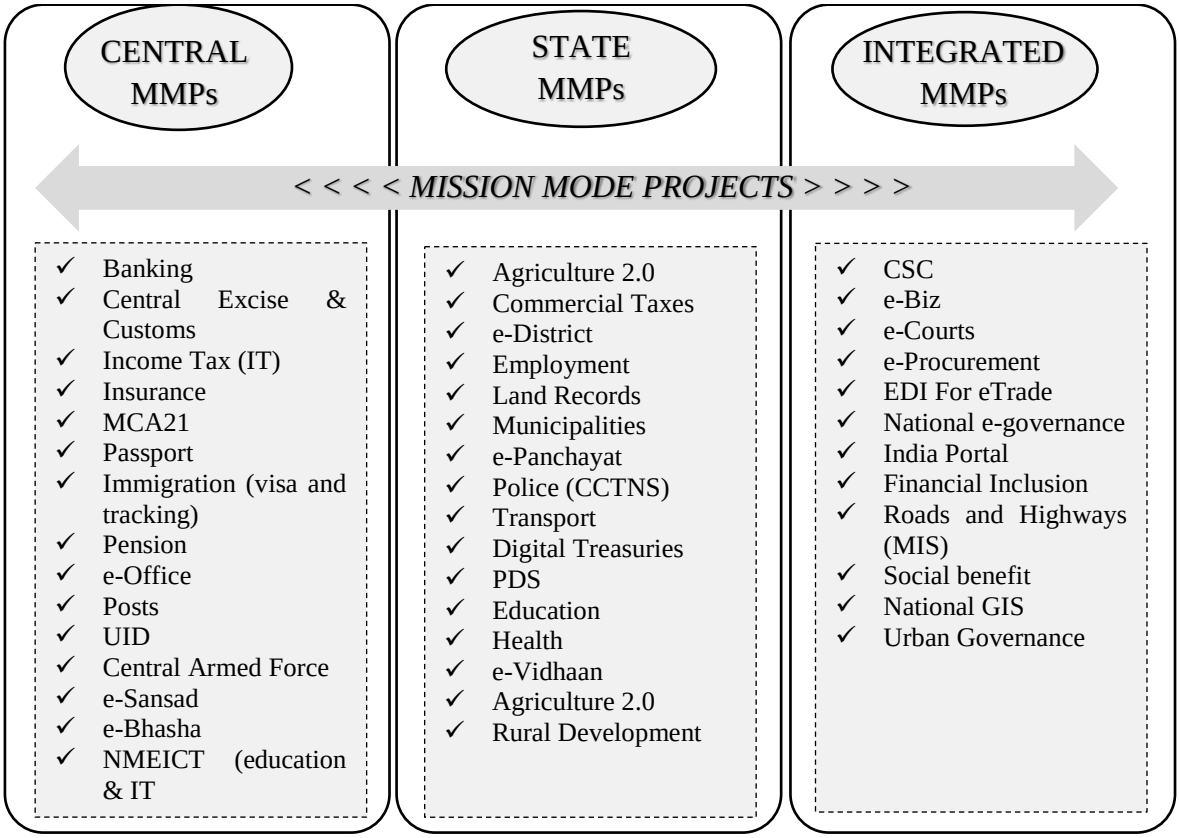
The Government is providing training and teaching skills to the youth for employment opportunities in the IT sector. This will include train people in smaller towns and villages for IT sector jobs, service delivery agent to run viable business delivery IT service, telecom service providers to train work force to cater their own needs.

9. EARLY HARVESTING PROGRAMMES:

Early Harvesting Programme basically consists of those projects which are to be implemented within short timeline. The projects under the Early Harvest Programme are as follows:

- IT Platform for messages for the mass messaging application
- Government greetings to be e- Greetings on festivals / on occasions.
- Biometric attendance in government offices

- Wi-Fi in all Universities
- Secure e mail communication within government to use as primary communication method



Picture : Mission Mode Projects-MMPs in Governance (Self Constructed)

A SNAPSHOT ON DIGITAL SERVICE IN INDIA

The Government of India has provided digital delivery of services at the doorstep of citizens, especially in the remote areas of the country in an affordable manner. The Government has facilitated digital empowerment of citizen by providing more than 3,500 services electronically across the country. The electronic transactions of these services are approximately 9.1 crore daily. The Mobile First policy of the Government has increased accessibility and convenience of users even in the remote areas. Common Services Center are offering 390 services in sectors, such as, education, health and agriculture etc. Digital delivery of services, such as, UMANG, Jeevan Pramaan, DigiLocker, eBasta, ORS, National Scholarship Portal and eSign etc., has improved the ease of living of the citizens. In order to transform the quality of services and to provide integrated services, initiatives under 'e-Kranti' utilize the emerging technologies, such as, cloud and mobile platforms leading to automation of knowledge work, digital payments, Internet of Things and intelligent transportation and distribution. These initiatives ensure easy, effective and efficient governance and services to citizens.

❖ **Common Services Centres (CSCs)**

CSCs are the front-end access points for delivery of various electronic services to the citizens close to the place of residence, thereby contributing to a digitally and financially inclusive society. Around 3.12 lakh Common Services Centres, spread all over the country, are ensuring digital delivery of services at the doorstep of the citizens, especially in the remote areas of the country in an affordable manner, creating digital empowerment by providing more than 350 services ranging from education, health, agriculture etc., and has been generating employment opportunities for rural youth. CSCs provide services like Financial Inclusion (Banking, DigiPay, Insurance and Pension), Healthcare services, Skill Development, BBPS, IRCTC, Utility Bill Payment, e-Commerce and e-Recharge etc.

Common Service Centres (CSCs) have empowered the citizens, including women, especially those living in the rural India. It is promoting Entrepreneurship through its self-sustainable model specially for women Village Level Entrepreneurs (VLEs). CSCs have provided employment to more than 12 lakh persons; out of these, 55,000 are

women VLEs. CSCs are digitally delivering various services to citizens close to the place of residence, such as, Ayushman Bharat enrolment, PAN card, banking and insurance.

❖ **DigiLocker**

DigiLocker is a platform for issuance and verification of documents and certificates in a digital way, thus it is helping in eliminating use of physical documents. Indian citizens, who sign up for a DigiLocker account get a dedicated cloud storage space that is linked to their Aadhaar (UIDAI) number.

❖ **Jeevan Pramaan**

Jeevan Pramaan is a biometric enabled digital service for pensioners. The Pensioners of the Central Government, the State Governments or any other Government organization can avail the benefit of this facility. Digital Life Certificate (DLC) for Pensioners Scheme of the Government, known as Jeevan Pramaan, seeks to address this problem by digitizing the whole process of securing a life certificate. Jeevan Pramaan has provided relief to old aged persons by eliminating the need of physical visit to Pension Disbursing Agencies. It provides an opportunity for anytime, anywhere submission of Digital Life Certificate (DLC) by the pensioners. This has streamlined the pensioners' verification process at Pension Disbursing Agency.

❖ **Mobile Seva**

Mobile Seva is an innovative initiative aimed at mainstreaming mobile governance in the country. Mobile Seva app uses mobile devices and applications for delivery of public information and services to all citizens and businesses. 1,000 mobile apps are hosted on the App Store for various domains and States, which are informative, or service based. Over 4,129 Government Departments have been integrated with the platform for mobile governance services.

❖ **UMANG (Unified Mobile App for New-Age Governance)**

UMANG has been developed as a unified platform to deliver major Government services through mobile phones. The platform enables the citizens to access primarily G2C services from the Central Government, State/UT Governments and local bodies as well as from their agencies from a single mobile app. UMANG is a single mobile app that currently offers 336 Government services. The target is to provide more than 1,200 digital services through this platform. 72 applications (336 services) have been onboarded on UMANG as on February 16, 2019. More than 1.1 crore users have downloaded this app, since its launch in November 2017.

❖ **Government e-Marketplace (GeM)**

The Government has created a one-stop Government e-Marketplace (GeM) to facilitate online procurement of common use goods and services required by the various Government Departments/Organisations/PSUs. On GeM platform, 33,501 buyer organizations, 1.99 lakh sellers and service providers and 7.97 lakh products have been registered.

❖ **Electronic Transaction Agregation & Analysis Layer (eTaal)**

eTaal is a real time and provides an aggregated view of e-transactions performed through implemented e-Governance applications, including the Mission Mode Projects (MMPs) defined under National eGovernance Plan (NeGP). eTaal automatically pulls e-transaction count from applications integrated with it using Web Services technology.

❖ **e-Sign**

eSign, an online electronic signature service, was launched in July 2015, as an alternative to the dongle based digital signature. eSign can be integrated with service delivery applications via an Application Programme Interface (API) to facilitate a user to digitally sign a document. Using authentication of eSign user through e-KYC service, online electronic signature service is facilitated. There are 4.90 crore users using eSign.

❖ **Meghraj**

To utilize the benefits of Cloud Computing, the Government has embarked upon an ambitious initiative - GI Cloud, which has been named as MeghRaj. This initiative accelerates delivery of e-services in the country, while optimising ICT spending of the Government. This ensure optimum utilisation of the infrastructure and deployment of e-Governance applications. Around 960 application are running on 14,000 virtual servers

❖ **Rapid Assessment Systems (RAS)**

Rapid Assessment System (RAS) has been developed for continuous feedback on e-services delivered by the Central Government and the State Governments of India. This system has multiple channels for receiving feedback and is backed by analytics. These analytics help integrated Departments for continuous system

improvement and better governance. The application uses state-of-the-art, API based technology, which makes it very simple for the Departments to integrate and use the feedback framework. RAS reduces the currently lengthy and tedious system of assessment/feedback. It provides a mechanism for continuous measurement of Quality of Service.

❖ **e-Office & e-mail Infrastructure**

e-Office is a digital workplace solution, which are built on Open Architecture and are easy to be replicated. e-Office brings transparent governance with automation of files and their easy tracking in real-time. It provides a digital repository for documents on policies, acts and regulations, manuals and standards.

❖ **e-Hospital**

e-Hospital is a one-stop solution for connecting patients, hospitals and doctors on the digital platform. It manages key functional areas and processes of hospitals and enables a patient to book an appointment with a doctor online without standing in long queues. A doctor can also view patients' records, i.e., lab reports, and scan reports etc., to take a quick diagnostic view and provide better patient care. e-Hospital has been implemented in more than 321 hospitals across the country from which over 260 hospitals are reporting live transactions.

❖ **Online Registration System (ORS)**

Online Registration System (ORS) is a framework to link various hospitals across the country via Aadhaar based online registration and appointment system, where counter based OPD registration and appointment system through Hospital Management Information System (HMIS) have been digitized. ORS has facilitated more than 22 lakh appointments since its inception

❖ **e-Sushrut**

Centre for Development of Advance Computing's (C-DAC) e-Sushrut, a Hospital Information System (HIS) has been developed with the objective of streamlining the treatment flow of a patient in the hospital, while allowing doctors and other staff to perform to their maximum abilities, in an optimised and an efficient manner. It also helps as a decision support system for hospital authorities to develop comprehensive healthcare policies.

❖ **Telemedicine**

Development of Advanced Computing (C-DAC) enables patients in the remote to engage in live consultation with doctors situated elsewhere, sharing medical records and test reports online.
Telemedicine solutions have been deployed in many States in India, including Odisha, Tamil Nadu, Kerala, Punjab, Sikkim, Mizoram, Himachal Pradesh and Rajasthan.

❖ **National Scholarships Portal**

National Scholarship Portal (NSP) is a one-stop solution through which various online services
related to scholarships, ranging from student application, application receipt, processing, sanction and disbursal of various scholarships to students are enabled. The Mission Mode Project (MMP) of National Scholarship Portal, under the National e-Governance Plan provides a common electronic portal for implementing various Scholarships schemes launched by the Union Government, State Governments and Union Territories across the country.

❖ **Virtual Classrooms**

Smart Virtual Classroom is a scheduled, online, teacher-led training session, where teachers are not present with learners physically but interact via a public network in an online learning environment. 3,204 Smart virtual classrooms have been set-up in 7 States, namely, Andhra Pradesh, Tamil Nadu, Gujarat, Rajasthan, Haryana, Himachal Pradesh, Tripura, equipped with Software based Video Conferencing and electronic teaching aid equipment. 9,664 Sessions have been conducted, till December 2018, in which 65,56,600 students have attended and 64,814 teachers have been trained.

❖ **Eduroam**

Eduroam is a global service that enables students, researchers and staff from participating institutions to obtain internet connectivity across campus. Students, researchers and staff, when visiting other participating institutions can simply open their laptop or activate their smartphone or other portable devices through WiFi for connectivity. With eduroam, a user gets internet access not only via own institution's wireless network but when visiting other participating universities, colleges, research centres and libraries too. Eduroam- One World , One Connectivity (Global Wi-Fi roaming services)

❖ **Soil Health Card**

Soil Health Cards (SHC) provide farmers with the nutrient status of their land and gives recommendations on the dosage of fertilizers, bio-fertilizers, organic fertilizers as well as soil amendments to maintain soil health in the long run. Soil health Card scheme is beneficial for farmers. The scheme generates awareness regarding the importance of soil health and application of fertilizers as per the soil test results.

- **eNAM**

National Agriculture Market (NAM) is a PAN India electronic trading portal, which networks the existing Agriculture Price Monitoring Committee (APMC) mandis to create a unified national market for agricultural commodities. The eNAM portal provides a single window service for all APMC related information and services. This includes commodity arrivals and prices, buy and sell trade offers and provision to respond to trade offers, amongst other services. 585 Mandis across 16 States and 2 UTs are live on e-NAM and 1.41 crore farmers have been registered on this platform.

- **e-Challan**

e-Challan is a comprehensive digital solution for Transport Enforcement wing and Traffic Police delivered through an android based mobile application and a web portal. It aims at improving service access and transparency in the system. On the spot challan facility is available with geo-tagging of challan spot. Anywhere, anytime challan investigation/disposal can be done using this platform.

- **e-Vahan and e-Sarathi**

Vahan 4.0 is a centralised, one-stop solution for services, such as, vehicle registration, permit, tax payments, fees payments etc. Sarathi 4.0 is a one-stop solution for services, like, issuance of driving license, learner license and international permit etc.

- **e-Courts**

e-Courts is a Pan-India Judicial Management Information System for facilitating National Judicial Data Grid (NJDG), Supreme Court, High Courts and District Courts. e-Courts has been helping in transforming Indian Judiciary by Information and Communication Technology (ICT) enablement of courts for enhancing judicial productivity and providing citizen-centric services.
e-Courts has been implemented in 39 High Courts and 3,067 District level courts. More than 10.8 crore cases have been registered, using this platform and 7.9 crore judgements have been made.

- **IVFRT: Immigration, Visa and Foreigner's Registration and Tracking**

Immigration, Visa and Foreigners' Registration and Tracking (IVFRT) is a biometric enrolment software, which implements an integrated and secure service delivery framework that facilitates legitimate travelers, enhancing the country's security from inimical foreign elements with its rich features and modules. It is modernizing and upgrading the immigration services and is providing a centralized system to share the information between agencies.

- **Open Government Data (OGD)**

The objective of OGD is to provide proactive access to the Government owned shareable data, along with its usage information in open/machine readable format, through a wide area of network across the country, in a periodically updated manner. It facilitates community participation for further development of the product with visualizations, APIs and alerts etc. It has an easy to use and user-friendly interface with dynamic.

- **MyGov**

MyGov platform is a first-of-its-kind participatory governance initiative involving the common citizen at large. The idea of MyGov brings the Government closer to the common man by use of an online platform to create an interface for healthy exchange of ideas and views involving the common citizen and experts with a goal to contribute towards the social and economic transformation of India. MyGov platform has issues important policy and governance for project like Clean Ganga, Girl Child Education, Skill Development and Healthy India to name a few. This has bridged the gap between the citizens and the Government.

- **eSampark**

eSampark is an Early Harvest programme under Digital India mandate of the Government. The objective of eSampark is to become the Governments IT platform for sending public service messages in the form of email/SMS across the Government bodies and the citizens establishing proactive communication by digitization of campaigns. eSampark is utilized by over 30 Ministries/Departments to send out informational messages . The portal has sent over 1,121 email campaigns to over 602.54 crore email addresses.

❖ **eSangam: Service Delivery Gateway (NSDG)**

It is a middleware infrastructure implemented by C-DAC, Mumbai, acting as a standard based routing and message switch, which provides seamless interoperability and exchange of data across heterogeneous applications of geographically dispersed departments. The National e-Governance Service Delivery Gateway (NSDG), a MMP under NeGP, can simplify this task by acting as a standards-based messaging switch and providing seamless interoperability and exchange of data. It offers a shared Services Hub for Departmental Application, such as, Payment Gateway Services, Mobile Gateway Services, and Authentication services (via UID). eSangam National Gateway is hosted at NIC Data Centre (Primary DC) in Delhi with its Disaster Recovery Centre (DR) at NIC, Hyderabad.

❖ **e-District**

e-District is a Mission Mode Project (MMP) that aims at electronic delivery of identified high volume citizen-centric services at the District or sub-District level. Ministry of Electronics & Information Technology (MeitY) is the nodal Ministry for e-District MMP. The objectives of the e-District project are to ensure an end-to-end workflow; to ensure delivery of e-Services by undertaking Business Process Re-engineering (BPR) of services; and providing easy, anywhere and anytime access to Government services. 2,651 e-District services have been launched in 687 Districts of the country.

❖ **State Data Centre**

State Data Centre (SDC) is one of the important elements of the core infrastructure for supporting e-Governance initiatives of National e-Governance Plan (NeGP). Under NeGP, it is proposed to create State Data Centres for the States/UTs to consolidate services, applications and infrastructure for provide efficient electronic delivery of G2G, G2C and G2B services.

SUMMARY

Digitalization has evolved not only the economic, but also the social vision of mankind. The digital era is denoted by continuous flows of data containing information, knowledge, ideas and innovations. Having completed industrialization, developed countries are successfully digitalizing their economies. They are rapidly developing innovative technologies where artificial intelligence, automation and digital platforms prevail. Digitalization is traditionally regarded as a positive characteristic of digital society development. However, digitalization has penetrated so deeply into all spheres of public life that there is a question whether human rights to privacy and anonymity may be infringed (Antikainen et al., 2018). In 2011, the UN recognized free access to the Internet to be a fundamental human right – a digital right.

In present scenario, it is easy to understand the advantages and disadvantages of digitalization, as well as to assert that it will be impossible to effectively manage the state and its economy without the active implementation of the latest developments in computer science, radio electronics, communications and telecommunications. Digitalization contributes to the reduction of poverty and the digital divide between people of all social groups and various social elevators.

At present, digital technologies are transforming the relations between economic catalyst in energy, e-governance, construction, banking, transportation, retail trade, education, healthcare, the media and security etc.

Digital India initiatives have empowered citizens of every panchayat with bottom up and top down information and content. And improve the development, governance and public service delivery at panchayat level through the information on policy programmes and implementation. Which overall facilitate growth of economy at micro-level and marked on the global digital map. The present government of India has been giving high priority to rural development with the objective to achieve rural- urban integration in growth processes. The focus of development is to include disadvantaged sections of society i.e. it includes " equality in growth " and equality of opportunity to all. The present strategy of rural development is to provide better infrastructure , for agriculture development , public health services, business and financial services in rural areas. In this context, digitalization holds the potential to offer a new approach to rural based development.

CONCLUSION

Government needs to make significant investments in areas such as government process reengineering, capacity building, training, assessment and awareness. Need for political ownership at the highest level and a national vision for e-Governance for successful implementation of the program. Socio-political power stability and e-

governance not only in urban areas but rural areas as well. The impact of ICT and of e-governance on the rural economy and consumer behavior is well recognized.

For better impact in society, e-Government must build trust within agencies, between agencies, across governments and stake holders. Even in areas where access to technological infrastructure is nearly ubiquitous, there are still marginalized groups who are unable to make use of information and communication technologies because they are not 'e-literate.', this should be taken care. A clear understanding and appreciation of the objectives to be achieved through e-Governance. Centralized and decentralized power as per the demographic need to be adopted with clear mission and objective and a strategy should be formulated to complete the objective in stipulated timeframe

Digitalization should be carried out through the economic growth by increasing the efficiency, productivity and competitiveness of the use of digital technologies, which implies the digital transformation of economic sectors, areas of activity, as well as the acquisition of new competitive qualities and properties in accordance with national or regional needs contributes to social, cultural and economic development, as well as strengthens the information society and democracy principles.

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