Paper Title: Digital Transformation for Self-Reliance in India: A Pathway to Economic Growth and Sustainability

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Abstract

In the long history of human existence, the idea of self-reliance has never been a new concept. Economists define self-sufficiency or self-reliance as the state of not requiring any aid, support, interaction or trade with the outside world. it means a national economy that seeks to use its natural and human capital to the maximum to generate growth and employment and, vitally, develop an economic and financial structure that is not excessively dependent on the outside world for markets, supplies and investments. In the present scenario, "Self-Reliance is the ability of a country to maintain its domestic supply chain along with satisfying the global demand. It is that state in which a country achieves more inclusive growth with human welfare at its heart". The digital economy is largely considered as pro-environment or green sector and the concept of digital transformation has gained immense prominence in today's rapidly evolving global landscape. In India, a nation striving for economic growth and sustainability, digital transformation presents a compelling pathway towards achieving self-reliance. Digital transformation begins with the development of a robust digital infrastructure that encompasses reliable high-speed internet connectivity, advanced data centres, and cloud services. Such infrastructure is essential for enabling seamless access to digital technologies across the country, thereby fostering innovation and competitiveness in both urban and rural areas. In the context of India, a nation striving for self-reliance and economic prosperity, the adoption and integration of digital technologies play a crucial role in accelerating progress.

The present chapter explores the transformative potential of digital technologies in promoting economic prosperity while ensuring environmental sustainability, thus laying the foundation for India's

journey towards self-reliance. This is descriptive research which helps to understand about the Digital transformation in India and its effects so far on economic growth and sustainability. The type of data used is secondary data obtained from sources such as research papers, newspaper, journals and magazine articles, media reports, government official sites, etc.

Key Words: India, Environment, Growth, Sustainability, Economy, Digitalization, Self-Reliance

Introduction

Digital transformation for self-reliance in India refers to leveraging digital technologies and initiatives to promote economic growth, reduce dependency on foreign goods and services, empower local industries and businesses, and enhance the overall socio-economic development of the country. The goal is to make India more self-sufficient and less reliant on external resources, technology, and expertise. It was in 1986, India went online for the first time. Back then, the Internet was only meant for the use of educational, research communities and defence purposes. During 1995, the VSNL opened the internet access to public by using modem. Now the game has changed most of the Indians have mobile phones which have internet access. In 2017, India had 331.77 million internet users and the figure is expected to grow 511.89 million internet users by 2022. Without considering the untapped potential, India is the second-largest online market worldwide after China. (STATISTICS PORTAL, n.d.). The internet usage has increased because of decline in the smartphone prices over the past couple of years and the fall in Internet data prices, which was certainly spurred by the arrival of Reliance Jio in 2016. There were 692.0 million internet users in India at the start of 2023, when internet penetration stood at 48.7 percent. India was home to 467.0 million social media users in January 2023, equating to 32.8 percent of the total population. A total of 1.10 billion cellular mobile connections were active in India in early 2023, with this figure equivalent to 77.0 percent of the total population (Digital India Report 2023). Despite being a software powerhouse, India's inhabitants had relatively limited access to electronic government services. The Demonetization efforts made recently expedited the use of digital payment methods in financial transactions at a faster tempo in comparison to other nations. After the paradigm shift, people have opened bank accounts, and more people using banking services. E-governance and digital services have emerged as key components in the quest for self-reliance. Digitizing government services and reducing bureaucratic hurdles through e-governance initiatives can enhance the efficiency and transparency of public service delivery. By streamlining administrative processes, India can create a business-friendly environment that fosters entrepreneurship and investment, thereby boosting economic growth. Manufacturing, a critical sector for self-reliance, can benefit significantly from the adoption of digital technologies. Industry 4.0 technologies, such as automation, robotics, and IoT, can enhance productivity, efficiency, and quality in manufacturing processes. The integration of digital solutions into the manufacturing sector can reduce import dependency, stimulate local production, and create employment opportunities.

Agriculture, being the backbone of India's economy, can leverage digital transformation to achieve higher productivity and reduce post-harvest losses. Digital agricultural solutions, including precision farming, smart irrigation, and farm management software, can empower farmers with data-driven insights and best practices, leading to sustainable agricultural practices and increased self-reliance in the food sector. The integration of digital technologies in manufacturing and agriculture will bolster self-reliance, while digital health initiatives will improve healthcare access for all. Embracing digital transformation with a focus on cybersecurity and data protection will pave the way for India's self-reliance journey in the digital age.

Historical Perspective of Self-Reliance

The term Self- Reliance which is becoming buzz these days is not a new term for Indian economy. The principle of self- reliance was initially stated by the M.K. Gandhi. Gandhian plan was based on the idea of self-reliance. PM Modi started Make in India program to encourage self-reliance in India but its seeds were sown several decades ago by the Father of the Nation Mahatma Gandhi. He had promoted the use of

"Khadi" clothing in the 1920s as a twin-pronged approach for empowering people with technology on the one hand and for opposing the commercial interests of the British. The Khadi movement had the objectives of boycotting imported foreign cloth and promoting the spinning of khadi for self-employment. Apart from the Khadi movement, Gandhi has advocated many philosophies like development of small-cottage industry, decentralization, focus on the development of villages etc. which encourage self-reliance.

Taking reference from Gandhian philosophy, our first Prime Minister Pt. Nehru came up with his socialistic and inward-looking approach, India could achieve self-sufficiency in some sectors such as; food and milk production. The goal of self-reliance was also part of the Fourth Five-Year Plan (1969-1974). The Fourth Five-Year Plan (1969–1974) set before itself the two principal objectives – growth with stability and progress towards self – reliance. It laid great emphasis on self-reliance in the agricultural sector so that a chain reaction can start. The Fifth Five-Year Plan (1974–1979) also focused on self-reliance in agricultural production and Défense.

Despite achieving some success, inward looking orientation of India was exposed when India faced a major balance of payment crises in the 1990s. This was the time when Prime Minister P.V. Narasimha Rao came up with a new connotation of self-reliance and summed up, *"One way of describing self-reliance would be to say that we should be indebted to the extent we have capacity to repay".* India, keeping pace with the changing circumstances, brought LPG (Liberalisation, Privatisation and Globalisation) reforms. With such an outward orientation, India in the next three decades could become a major economic power. But as it is said, crises reflect the weaknesses of a nation. Likewise, the current crisis in the form of COVID-19 has exposed our over dependency on others. To deal with the current challenges, our Hon'ble Prime Minister Narendra Modi came up with a more balanced version of self-reliance. Although the announcement of a new connotation with 5 pillars made recently by our Hon'ble PM but the groundworks had already started since the beginning of his first tenure.

Whether it was Make in India, Digital India or Swachh Bharat Abhiyan all has somewhere pushed India towards achieving self-sufficiency. With JAM Trinity (Jan-Dhana, Aadhar, Mobile) and Direct Benefit Transfer, India could bring transparency and accountability in execution of welfare schemes as a result today almost 425 welfare schemes of Govt. working successfully at ground level. In addition to this, India brought Insolvency and Bankruptcy Code and Fugitive Economic Offender Act, GST (Goods and Services Tax), National Infrastructure Pipeline Project etc. These achievements might be said the way in the right direction but not destination. Despite above interventions, Govt. has not been able to render Indian companies more competitive. India is still far away to become a self-reliant nation. Before discussing about new connotation of self-reliance of New India, we are going to discuss about the dependency theory and India's dependency over other economies

Why Self-Reliance is necessary:

The dependency theory of development propounded by Raul Prebisch analysed the fact that economic growth in the advanced industrialized countries did not necessarily lead to growth in the poorer countries. Indeed, their studies suggested that economic activity in the richer countries often led to serious economic problems in the poorer countries. The dependent states like Latin America, Asia, and Africa which have low per capita GNPs and which rely heavily on the export of a single commodity for foreign exchange earnings face more critical problems in their BOP. Another example of harmful effect of dependency is the countries like Nepal, Pakistan, Bangladesh and African nations which are falling in the debt trap of dominant countries on which they are dependent excessively. There are various types of sector in which India lagged other countries and having excessive dependency. Few Examples are; Crude oil from OPEC, Défense equipment from USA, Russia, Israel and France, Electronics and Pharmaceuticals from china. If we talk about the dependence on foreign exchange in the form of remittances on the Gulf and the US. We know that India cannot reduce the dependency in these sectors easily and quickly in future. So, it is not clear how the new Modi strategy of self-reliance proposes to deal with this dependence.

New Connotation of Self-Reliance:

To overcome the current challenges Indian PM brought his version of self-reliant India. First, a step up in public spending and investment, aimed at promoting welfare and raising the investment rate. Second, policy

reforms aimed at making the domestic economy more globally competitive. Third, a long-term structural shift making the economy more "self-reliant" and less dependent on the world economy. Similarly, he announced the five major pillars of self-reliance.

1st Pillar- Economy: Our Hon'ble PM said we need a quantum jump instead of incremental growth in the economy. India is the 5th largest world economy and targets to become 5 Trillion economy by 2025.

2nd Pillar- Infrastructure: For every economy, infrastructure is the backbone and primary need for the growth of the economy. We need Infrastructure that should be world-class which connects rural India to urban India and becomes the identity of New India

3rd Pillar- Demography: India is the 2nd largest populated country and has largest working population in the world. To become self-reliant, India needs to take the advantage of demographic dividend through upgrading the skills and productivity. India is nowhere lacking in potential and talents and we have proved it in the current crisis by becoming the 2nd largest PPE kits manufacturer.

4th Pillar- System: For a self-sufficient economy, India needs a more robust and technology driven system which can withstand against all odds. For this purpose, India need to spend more on research and development projects and need to take full advantage of 4th industrial revolution.

5th Pillar- Demand: With more than 130 crore population, India has one of the largest consumer bases in the world. Due to Covid-19, India is facing both supply side and demand side shocks on the economic front. Therefore, there is opportunity to take the lessons from the problems and build a strong block chain of supply as well as strengthen the competitiveness of domestic manufacturer and raise the voice of "VOCAL for LOCAL"

Digital Transformation/ Digital Economy of Indian Economy:

During 1st July 2015 Modi government 's flagship programme 'Digital India' was introduced. This programme is to transform the entire ecosystem of public services through the use of information technology. The services are provided to the people with the help of mobile phones, personal computers, laptops, tablets, televisions, radios and internet. The vision is to transform India into a digitally empowered society and knowledge economy electronically (McKinsey Global Institute 2017). It really focusses on making the government administration accessible to every citizen electronically by reducing paper work. This programme aims to remove the gap between the rural and urban people. This initiative consists of plans to connect rural areas with high-speed internet networks. The Digital India programme covers agricultural, industrial, service sectors which constitutes the growth of the economy. It focusses on three core areas: digital infrastructure a utility to every citizen, digital empowerment of citizens, governance and services on demand. The project purposes to connect the 2.5 lakh villages across India through broadband highways, public internet access, universal access to mobile connectivity, e-governance, e-kranti, information services for all, a sturdy electronic manufacturing regime, early harvest programs, and IT for jobs—conferred as the nine pillars of Digital India. Joint collaborative research by Huawei and Oxford Economics pegged the size of the global digital economy to be around US$11 trillion i.e., 15.5% of global gross domestic product (GDP) in 2016, which is expected to reach US$23 trillion (24.3% of global GDP) by 2025.

The Size of India's Digital Economy:

According to World Bank Report, Before Aadhaar, only one in 25 people had any form of formal identification, and just one in four had bank accounts. Aadhaar has transformed the authentication ecosystem in India and replaced multiple government IDs, such as passports, PAN cards, ration cards, and voter IDs, for authentication. Today, Aadhaar is ubiquitous: it provides easy and quick authentication to millions of Indians, helping to empower citizens. The Indian government has been pushing for zero-balance bank accounts under the Pradhan Mantri Jan Dhan Yojana (PMJDY), opening over 450 million accounts by 2022. Aadhaar has been instrumental in achieving this goal, as it has facilitated the KYC process,

reducing the cost of conducting e-KYC from $12 to 6 cents. This has helped extend banking to millions of Indians, improving financial inclusion and reducing corruption in government services access for the poor. According to the same report, “In 2021, the UPI platform facilitated over 38 billion transactions worth about $900 billion through mobile apps such as PhonePe, Google Pay, and WhatsApp. In 2022, this number increased to a staggering 74 billion transactions, amounting to $1.5 trillion.” The number of digital transactions increased more than three times from 300 crores in November 2019 to 1,052 crores by January 2023. The value of total digital payments relative to nominal GDP was 8.7 times the nominal GDP in FY19. Although it fell during the COVID-19 year, this multiple is rising again. As per the RBI, the share of India’s core digital economy increased from 5.4% of GVA in 2014 to 8.5% in 2019. In US dollar terms, India’s digital economy exhibited a growth rate of 15.6% over the period 2014 to 2019, which was 2.4 times the growth of the Indian economy. Further, the share of digitally dependent economy (digitally enabled sectors) is estimated at 22.4% in 2019. According to a recent study published by ACI Worldwide in collaboration with Global Data, India is way ahead even in comparison with China in terms of the number of digital payments. According to this source, the number of real time payments in 2021 were at 48.6 billion in India as compared to 18.5 billion in China and 8.7 billion in Brazil. This is indicative of the ease with which the Indian population has adopted digital platforms for making payments even if the average value of such payments may be rather low.

Digital Transformation for Economic Growth:

Digital transformation plays a pivotal role in driving economic growth in India by facilitating increased efficiency, productivity, innovation, and market expansion. Digital technologies enable automation, streamlining of processes, and improved collaboration, leading to enhanced productivity across industries. With increased efficiency, businesses can produce more output with the same or fewer resources, contributing to overall economic growth. On the one hand, digital transformation leads to growth by The ADB (2021) framework for measuring digital economy identifies backward and forward linkages associated with core digital economy. According to this framework, core digital products are classified into five product groups namely: (a) hardware, (b) software publishing, (c) web publishing, (d) telecommunications services, and (e) specialized and support services. It defines digital economy as the contribution of economic transactions that involve both digital products and digital industries to GDP (or Gross Value Added (GVA)). Digitally enabling products reflect backward linkages of the core digital economy while digitally enabled products capture forward linkages. As per RBI, industries with the highest forward linkages in India from the aggregate core digital economy in 2019 were construction (6.1%), renting of machinery and equipment (4.2%), food beverages and tobacco (3.8%), textiles and textile products (3.6%), and electrical and optical equipment (3.5%). The value of total digital payments relative to nominal GDP was 8.7 times the nominal GDP in FY19. As per the RBI,5 the share of India’s core digital economy6 increased from 5.4% of GVA in 2014 to 8.5% in 2019. In US dollar terms, India’s digital economy exhibited a growth rate of 15.6% over the period 2014 to 2019, which was 2.4 times the growth of the Indian economy. Further, the share of digitally dependent economy (digitally enabled sectors) is estimated at 22.4% in 2019.

Digital Transformation for Sustainability:

The definition given for sustainable development by Brundtland Commission, 1987 was “meeting the needs of the present generation without compromising the ability of future generation to meet their own needs”. Green economies and environmental resilience are often associated with digitalization. Such an association is highlighted by Baedeker et al. (2016) "Currently, we are consuming more ecosystem services and more natural resources than nature is providing on a sustainable basis." Change can only take place through the transformation of production and consumption systems. This involves modifying products, services, and business models toward resource-efficient production patterns and lifestyles, leading to "Digitalization and Industry 4.0” (Baedeker et al., 2016, p. 37). Lockton, Bowden, & Matthews (2016) have also emphasized digitalization as a tool for a greener economy and environmentally friendly practices. They also observed

that "Mainstream 'interventions' largely take the form of redesign of products and services themselves, or the design of interfaces, usually digital, and usually visual, which give users information and feedback (and sometimes feed forward) on use or the impacts of their actions. The digital approach builds on significant work in HCI on persuasive technology…and on the effectiveness of behavioural feedback from other disciplinary perspectives". Martin et al. (2019) have also highlighted the role of digitalization in innovative urban sustainability. Timonen et al. (2018) have given their full support to digitalization in the hopes of making the world a better and more sustainable place than it is now. Halkos (2018) expressed his somewhat conflicting ideas about the pros and cons of digitalization and environmental interaction after considering a significant volume of literature. Laitinen et al. (2020) emphasized existing works and perceptions of digitalization, the green economy, and sustainable development. Fedulin et al. (2020) have extended their critical support for the digitalization and automation of environmental control systems toward a sustainable environmental model. Jamwal et al. (2020) have mentioned that Industry 4.0, through its automation, will lead towards socially sustainable solutions. Heilmann et al. (2020) have almost made the drive towards green and digitalization synonymous. Lanshina et al. (2020) agreed that digitalization can help the environment and lead to sustainable development. Zachariadis (2020) also supported the direct relationship between digitalization and green transformation. He focused on making the electricity grid system more digital and creating digital services for green energy. He talked about Cyprus and how a strong digital economy will help the country grow in a sustainable and green way. He had vehemently introduced even crypto currency and proposed that such e-currency will work as a positive catalyst towards greener sustainable development. The research found the following: first, the digital economy has significantly improved the efficiency of the green economy in India. Second, by leveraging digital tools and innovations such as E-government, smart transportation, E-commerce, supply chain etc. India can transform its various sectors and address sustainability challenges effectively. However, it's essential to ensure that digital transformation is accompanied by robust policies and regulations to mitigate potential negative environmental impacts, such as e-waste generation and excessive energy consumption from data centres.

Challenges ahead in front of India:

Industries happen to be the strongest pillar of any economy. Without them, no country could dream to become self-reliant. In Indian context, complicated labour laws, unstable liquidity patterns and inconvenient land acquisition process have been major roadblocks for the industrial sector. In COVID19 Crisis, India could become an attractive destination for FDI and companies wishing to change their bases from China but for that India must bring reforms in 4L suggested by our Hon'ble Prime Minister that is: Land, Labour, Laws, Liquidity. For becoming self-reliant in the manufacturing sector, India needs to reform 4Ls. For making land acquisition process simple and transparent, India should utilise block chain technology. Besides it, India needs to liberalise company and labour laws to give more say to industrial management. In addition, Minimum Government and Maximum Governance is the need of the hour. At last, but not the least to boost liquidity, Govt. needs to enhance the Purchasing Power of consumers by infusing cash in the economy. Above are the major reforms that are needed by our economy; besides these reforms some other challenges are also major roadblocks in the path of self-reliant India:

- Unskilled Labour: India has a very large unskilled illiterate workforce when compared with other nations. Only 4% of India's workforce is skilled in contrast to China 25%. According to another survey China's labour is 4 to 5 times more skilled as compared to India.
- Rigid Laws: Complex and Rigid laws in India hinder the decision-making process and create a negative atmosphere for start-ups. Even after introducing GST, India's Tax structure is very complicated that makes the business process further complicated.
- Minimal Women Participation: Women account for half of India's population but they are still within four walls of the house without involving half of the population no country ever becomes self-reliant.
- Lack of Manufacturing Power: Today, India is the world's second largest Smartphone market. However, it does not make any of these phones itself, and manufactures only a small fraction of solar photovoltaic cells and modules currently used, with an ambitious future target.

The Way Forward

"In the midst of every crisis lies great opportunity", this statement of Albert Einstein reflects the attitude a country should have. India should learn from the weaknesses; that the ongoing crisis has exposed. India has a very large young population; this could become our greater resource if made it productive. We could learn from other Asian Nations, like Japan. Despite having almost no natural resources, Japan is the 3rd largest economy in terms of GDP. It could become possible for Japan due to its productive and skilled workforce. In the line of Japan, India can enhance the productivity rate of our population through a robust education and healthcare system. We must create technology driven risk-free education and healthcare infrastructure. SWAYAM, an online education portal is a step in that direction. But to serve such a large country, India should work more on the idea of "smart villages". As Gandhi Ji said, "India lives in its villages". So, the road of self-reliant India must pass through its villages. And there are also numerous examples set by the rural India which fits valid for Self-Reliant nation: As Darwin said, "Survival of The Fittest". At a time when technology and innovations are the powerhouse for any economy, India can't afford any compromise. To synchronise with the current requirement, we must revitalize our Research and Development Process.

Conclusion

It is evident from the above discussion that technological advancement is necessary for developing nations. India is aspiring to be a leader in different global technology platforms in order to fulfil that it is vital for digital technologies to be used to improve public services, deliver financial inclusion etc. India has understood this secret and they have embraced digital India campaign to enhance effective communication between citizen and government while providing essential services with easiness. So far, digital India campaign is successful since it has assisted India dramatically by creation of job opportunities, improving literacy rates, eliminating corruption, technological advancements as well as boosting gross domestic product. In conclusion, digital transformation presents an unparalleled opportunity for India to achieve economic growth while fostering environmental sustainability and self-reliance. By investing in digital infrastructure, promoting e-governance, and advancing financial inclusion, India can unleash its true potential as a digitally empowered nation. Encouraging indigenous startups, upskilling the workforce, and embracing sustainable digital practices will propel India towards a future where economic growth and self-reliance coexist harmoniously. By integrating digital technologies in key sectors, India can navigate towards a more resilient and sustainable future in the digital age.

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