

Social economic impact of COVID-19 outbreak in India

COVID-19
outbreak in
India

Sandeep Kumar M., Maheshwari V., Prabhu J., Prasanna M.,
Jayalakshmi P., Suganya P. and Benjula Anbu Malar M.B.

*School of Information Technology and Engineering,
Vellore Institute of Technology, Vellore, India, and*

R. Jothikumar

*Department of Computer Science and Engineering,
Shadan College of Engineering and Technology, Hyderabad, India*

309

Received 10 June 2020
Revised 11 June 2020
Accepted 11 June 2020

Abstract

Purpose – The situations of COVID-19 will certainly have an adverse effect over and above health care on factors of the internet of things (IoT) market. To overcome all the above issues, IoT devices and sensors can be used to track and monitor the movement of the people, so that necessary actions can be taken to prevent the spread of coronavirus disease (COVID-19). Mobile devices can be used for contact tracing of the affected person by analyzing the geomap of the travel history. This will prevent the spread and reset the economy to the normal condition.

Design/methodology/approach – To respond to the global COVID-19 outbreak, the social-economic implications of COVID-19 on specific dimensions of the global economy are analyzed in this study. The situations of COVID-19 will certainly have an adverse effect over and above health care on factors of the IoT market. To overcome these issues IoT devices and sensors can be used to track and monitor the movement of the people so that necessary actions can be taken to prevent the spread of COVID-19. Mobile devices can be used for contact tracing of the affected person by analyzing the geomap of the travel history. This will prevent the spread and reset the economy to the normal condition. A few reviews, approaches, and guidelines are provided in this article along these lines. Moreover, insights about the effects of the pandemic on various sectors such as agriculture, medical industry, finance, information technology, manufacturing and many others are provided. These insights may support strategic decision making and policy framing activities for the top level management in private and government sectors.

Findings – With insecurities of a new recession and economic crisis, key moments such as these call for strong and powerful governance in health, business, government, and large society. Instant support measures have to be initiated and adapted for those who can drop through the cracks. Mid- and long-term strategies are required to stabilize and motivate the economy during this recession.

Originality/value – A comprehensive social-economic development strategy that consists of sector by sector schemes and infrastructure that supports business to ensure the success of those with reliable and sustainable business models is necessary. From the literature analysis and real world observations it is concluded that the IoT, sensors, wearable devices and computational technologies plays major role in preserving the economy of the country by preventing the spread of COVID-19.

Keywords COVID-19, Implication, Industry, IoT and wearable devices, Socio-economic growth

Paper type Research paper



1. Introduction

The impact on the economy because of COVID-19 in India has been extremely disruptive. The World Bank and credit rating agencies have reduced India's

development for the financial year (2021), and India has already faced the lowest statistics over three decades, since trade liberalization in 1990 (*The Times of India*, 2020). In the 21-day lockdown announced after the coronavirus epidemic, the Indian economy is projected to lose more than 32,000 crores every day (*The Hindu Business Line*, 2020). Owing to lockdown, around 53% of enterprises across the country will be affected (*The Indian Express*, 2020). The lockdown constraints placed the supply chain into stress and lack of transparency in streamlining about essential commodities. The most particular groups of affected and at risk are the informal sectors and daily wages (Das, 2020). Many farmers across the country who cultivate food items are facing uncertainty. Various businesses such as hotels, airlines are cutting wages and layoffs for workers. Also, around 3,000 crore losses have occurred in the live event industry (Goyal, 2020). During 3rd week of March, 2020 Amazon and Walmart-owned Flipkart revealed that they might stop selling non-essential products in India to concentrate on critical supplies. Many rapid-growing consumer goods enterprises in the country have dramatically reduced their business and attention toward the essential products. UltraTech Cement, Aditya Birla, Tata motors are some major companies that have halted or limited their activities temporarily. Some activities of iPhone suppliers in India have been halted. Many young start-ups were affected as the funding dropped. On March 23, 2020, stock markets in India experienced their most significant drop in history (*The Indian Express*, 2020). On March 25, 2020 one day after PM declared a 21 days complete lockdown, SENSEX and NIFTY show the highest growth in 11 years, contributing a cumulative of 4.7 lakh crore to shareholder capital (Shah, 2020). Indian Government has initiated several steps to solve the crises, starting with food security, and increase funding on health care, to sectors related to support and prolonged tax schedules.

We summarize the effects of COVID-19 in India based on three sectors, namely, primary sectors, secondary sectors and tertiary sectors.

2. Primary sector

2.1 Agriculture and supply chain

COVID-19 affects several practices in agriculture and supply chains. Initial reports reveal that certain harvest practices are affected by the lack of availability of migrant workers, notably in north-western India, where wheat and pulse were cultivated. There will be difficulties in the supply chain because of transport problems and other concerns. The prices of wheat, vegetables and other crops have decreased, but buyers still pay more. News reports indicate that the closing of hotels, restaurants, sweets and tea shops during the lockdown is already undermining the sales of dairy, whereas chicken farmers were severely affected by rumors, especially on social media that chicken is the transmitter of COVID-19 (Mahendra Dev, 2020).

Some necessary precautions are needed to keep the agricultural sector and supply chain processes working, some of them are as follows:

- The government has adequately provided lockdown rules that exempt farm practices and supply chain. Moreover, the challenges in execution lead to workforce shortages, and dropping costs should be addressed.
- Farm communities must be secured against COVID-19 to the best of its ability by monitoring and maintaining social distancing.
- Farmers must have continuous connectivity to markets. It could merge both private business and government procurement.

- Local poultry and milk farmers need more support because of the current outbreak-related input supply and market access issues.
- Farmers and agricultural workers should be included in the government support strategy and in any social welfare service mitigating the ongoing situation.
- As the quarantine initiatives have risen, demand for home delivery of food and e-commerce has increased.
- The government should facilitate exchange by avoiding export restrictions and controls on imports.

Almost all economic activity has been cut off by the lockdown. In metropolitan areas, there is a significant loss of wages and employment for migrant workers and the homeless. The prediction by the Center for tracking the Indian economy indicates that inflation increased from 8.4% in mid-March to 23% during the 1st week of April. In large cities, unemployment increased to 30.9% on April 5. The shutdown will cause problems for migrant workers and the poor who lives unstable conditions and expected to face hunger and deprivation. The best way to combat this immediate need is to make substantial use of social welfare programs to secure their lives with food and funds. Indian Government reacted strongly to the situation and declared a \$22 billion support scheme that comprises groceries and money transfers. The \$22 billion in funding is only 0.85% of Indian's gross domestic product (GDP), which is much lower than the schemes proposed by the USA, Europe and other Asian countries. India should aim higher and spend at least 4%–5% of their GDP (Mahendra Dev, 2020).

2.2 Impact on COVID-19 – medical industry in India

The COVID-19 pandemic has arisen as a global health outbreak without precedent. While the level of implications remains to be measured, the effect on the global exchange in the near and in the distance future is apparent. The worldwide medicines supply chain will probably be disrupted, and the effect on global availability to medicine, notably in low- and medium-income countries (LMICs), will face profound effects. During 2018–2019, India supplied around \$19 billion in medicines to more than 200 countries, from the highly controlled marketplaces of North America and European countries with minimal resources in the medical industry, including sub-Saharan Africa (SSA). The Indian Ministry of Medicine estimated that formulation and biologics contain 77% of all Indian sales, and that Indian companies offer 20% of global generic supplies. Indian companies hit 40% generic competition in the USA and a quarter of that in Europe.

Indian companies supply around 70% of their large quantities of medicines from China, where the manufacturing of active pharmaceutical ingredients (APIs) and supply chain service have been affected by the current COVID-19 epidemic. The Indian Government has limited export of 26 large quantities of medicine and their formulas. Global reliance on India's generic products is expected to be a complex international challenge in the context of the COVID-19 outbreak. There is no suitable replacement for API supplies or sufficient productive capacity, and more notably, any country capable of producing is probably to be centered on regional needs and not trade and growth support.

Control and monitoring of COVID-19 outbreaks in India are of utmost concern for both India and the world. The potential to acquire manufactured goods, produce and sell drugs not only defines how the significant proportion of LMICs will respond to the epidemic but also influences middle-income countries. To be a significant part of India's growth, the condition of its medical industry will decide its effect on the 1:5 of the global population.

India has demonstrated its importance in ensuring the safety of millions of people all over the world in the competitive and sustainable medical industry. Exceptional steps to improve and preserve the operation of the production facilities should be implemented. Governments and foreign entities relying on India for production would take into consideration of the Indian medical supply chain across their specific necessities. Detailed plans are needed to ensure worldwide connections to Antiphospholipid antibody syndrome (APIs) and medicines. In a few months, medical regulatory agencies are required to approve testing devices, drugs and vaccination to detect, treat and prevent COVID-19 pathogens. A substantial scale development of certain pharmaceuticals will allow and provide complete support to the world medical industry. By taking the output capacity of Indian companies into consideration, their role in a transition to some modernity after the outbreak will be vital for the rest of the globe and also for India.

2.3 Petrol and oil

The domestic requirements for petrol, diesel, gasoline and shipping fuel have all contracted 10% during the March, 2020 the first such decrease in many years as the COVID-19 outbreak significantly restrict public activities and slow down the economic growth. Sales have dropped at gas pumps and compressed natural gas service stations from several states, indicating that March-April might turn to be the worst month in many years for fuel consumption, despite a drop in fuel prices (Choudhary, 2020). By decreasing, gross margins might have influenced the profits of oil producers and distributors who are already facing substantial market losses this half as a consequence of the oil price drop. The total demand for liquid fuels has reduced around 10%–11% (Choudhary, 2020). Owing to limitations on movement and travel warnings, sale prices decreased over 10%, and bunker fuel sales are down to 10% approximately.

3. Secondary sectors

3.1 Information technology

The COVID-19 outbreak has severely affected the global economy, hampering industries across various fields around the world. The transmission of the diseases has forced countries into lockdown, anticipating the economy of a deflation. As the virus influences most of the developed countries dramatically, its effect on India is comparatively smaller than others but has a more significant impact on the businesses and economy of the country. Nearly 55% of electronics are manufactured in China; these have already slipped to 40%, in response to the coronavirus outbreak and subsequent quarantine (Kumar, 2020). The IT industry has been India's dominant sector in economic development in the past few years. It performs a crucial role in satisfying the country's middle-class dream of achievements and idealistic professions. According to the industry professionals, competitors in India's IT services might face a considerable slowdown in growth throughout this financial year because of the COVID-19 outbreak. This study indicates that leading software exporters such as TATA Consultancy Services (TCS), Hindustan Computers Limited (HCL) and Infosys will be influenced by reduced technology investment from shareholders in the USA and Europe during the global lockdown.

During crises, Brokerage Housing Development Finance Corporation (HDFC) securities predict revenues from the IT field to drop by 2%–7% because of a gap in decision-making over the next six months, as corporates determine the severity of the epidemic (Kumar, 2020). Owing to the current fear of the uncertain economic situation and financial crises, clients are expecting to cut their IT expenditures and delay the new developments. The National software and services companies Association (NASSCOM) states that India's

exports of software and services increased by 8.1% to US\$147 billion in the financial period of 2020 (Kumar, 2020). In contrast, Infosys and HCL Technologies provide yearly projection, whereas Wipro offers quarterly revenue guidance. Moreover, companies have yet to reveal dates for their quarterly outcomes. Meanwhile, in the 2nd week of April, other information technology (IT) companies in the country such as TCS and Infosys launch the resulting calendar.

Owing to constraints in air travel and closure of cities and states to control the transmission of the COVID-19, India companies have faced many client cancellations of projects across the field. COVID-19 outbreaks are also influencing the pharmaceutical industry, as 70% of effective antibiotic products are manufactured in China. These effective antibiotic products are invaluable to a substantial number of antibiotic-producing firms in India. Except for banking, health service, finance and the real estate market are estimated to take on a significant part of the damage caused by the COVID-19 outbreak in the country since March 2020. Additionally, the total impact of the virus on India's economy was estimated to hit about INR 8.8 trillion (Kumar, 2020).

3.2 Finance industry

3.2.1 Coronavirus influence on the Indian digital payment sectors. The effect of Coronavirus on the global economy is predicted to be dramatic, whereas India is expected to lose over \$348 million dollars (Khosla, 2020). The rapid spread of COVID-19 has become one of the major risks to the capital markets and the global economy. Countries around the globe are taking random precautions such as limiting the movement of people, locking down entire town and villages, closing public spaces such as malls, cinemas, tourist sites which encourage the public to stay in the home, maintaining social distance and restricting unwanted transport to control the influence of the coronavirus epidemic.

3.2.2 How digital payment sector is affected in India because of COVID-19. The negative impacts are taking the brunt of the slowdown in trade, transportation and tourism for significant sectors of the Indian economy. Online and offline payments are taken out through major companies that have an adverse effect because of various constraints on curbing the epidemic of COVID-19 until it becomes unpredictable. Although online sales on digital channels stay high, payment values also decreased dramatically. If the scenario remains for long, online payment firms will struggle over the next two months, as people are cautious about traveling outside (Khosla, 2020). The uncertain situation in which the COVID-19 epidemic is immersed in the social and economic domain, it may have a temporary influence on shopping structure. It could be a tremendous boost for e-commerce, such as grocery, food and entertainment.

In the past four years, digital transactions, supported by the demonetization and continuing policy movement to establish a cashless Indian economy, have risen exponentially from 5% to over 30% (Khosla, 2020). Hotel booking websites, movies, occasion booking gateway and entertainment media around other compensate provide almost 40% of online payments in India (Khosla, 2020). Electricity bills and telecommunication support the remaining. Moreover, financial technology experts believe that it is too premature to evaluate the effect of COVID-19 on the industry if digital payments increase or get a short-term implication. The outcome could be determined over the next 15–20 days if digital transactions increase or decrease, as tourism and travel were reduced. Although some industries were adversely affected by the COVID-19 epidemic, they have reduced online payment usage, and some new markets have also emerged.

3.3 Manufacturing industry

COVID-19 has already incurred a substantial impact on Indian enterprises, and that employment is at significant risk over upcoming weeks, as companies are looking to decrease the workforce. Further, in recent times, the COVID-19 situation had already triggered an unexpected drop in financial activities. The present situation shows a significant level of impact on their business, as nearly 72% of the participants (Goyal, 2020). In addition, 70% of the analyzed companies are expecting a declining sale in the financial year (2020–2021).

In terms of trade (import), China is the second largest importer and exporter. The report says that 13% of global exports and 11% of global imports. It has a significant influence on the Indian business sectors. In imports, the dependence of India on China is large. Top 20 goods imports by India from the world, China has large shares on it. India contributes around 45% of China's cumulative electronic products. Roughly 1/3 of machinery equipment and almost 2/5 of the organic compounds that India collects from the country come from China (Goyal, 2020). China's involvement in India's imports for automotive parts and pesticides is more than 25%. Roughly 65%–70% of active antibiotic materials and nearly 90% of all cell phones are imported from China. We might also say that because of the current epidemic of Coronavirus in China, import demand will have a direct influence on the Indian sector, as shown in Figure 1.

In terms of trade (export), China is the third biggest export alliance in India and contributes to about 5% in its exports. The results can contribute to organic chemicals, plastics, fish products, cotton and ores. Most of the Indian firms are positioned in the eastern part of China. Around 72% of companies in India placed in cities of China like Shanghai, Beijing, Shandong, etc. Industrial manufacturing services, IT, logistics, chemicals, and airlines are some industries companies working in China (Goyal, 2020).

Several industries in India have been shown to be threatened by the coronavirus epidemic, in China like shipping, pharmacy, automobile, smartphone, appliances, and fabrics. In fact, a supply chain can cause certain disruptions in the business and market. In specific, the effects of Coronavirus are moderate in the industry.

4. Tertiary sectors

4.1 Education

The COVID-19 outbreak in 2019–2020 has significantly impacted global educational systems to an extent that it has led to an indefinite shutdown of school and universities. As per the report on April 8, 2020, nearly 1.716 billion students have been significantly

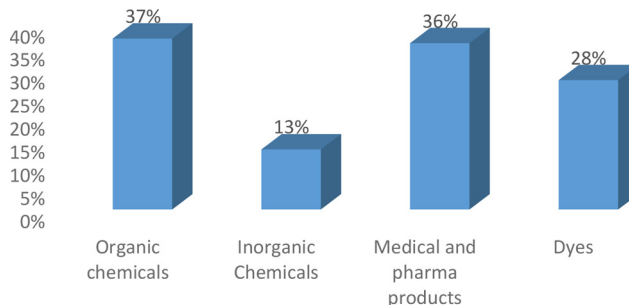


Figure 1.
China's share in overall imports to India

Source: <https://commerce.gov.in>

impacted in response to COVID-19 because of school shutdowns (UNESCO, 2020a). Closure of schools not only influences learners, teachers and families but also affects the social and economic status of many. The shutdown of schools in response to COVID-19 have highlighted numerous global issues such as digital learning, food insecurity, childcare, internet, health care and disability services. The subsequent impacts are higher on poor children and their families, resulting in discontinuity in learning, adverse physical and psychological health issues, childcare and associated economic costs for families who are unable to do work.

Efforts to combat COVID-19 transmission by anti-pharmaceutical therapies and prevention measures such as social distancing and self-isolation have driven to the systematic closing of elementary, secondary and high schools in more than 100 countries. Earlier epidemics of pathogens triggered massive school closures globally with varying rates of potency. Numerical modeling has shown that closed schools can delay the spread of an epidemic. Moreover, effectiveness (potency) relies on communications among children in or around the school. Cancellations of schools can be productive when adopted immediately. If cancellations happen late in contrast to an epidemic, they could be less active and do not influence at all. In some cases, restarting schools after shutdown duration may result in higher rates of infections. As closures appear to be similar to other initiatives such as public gathering bans, the particular impact of school closures can be hard to quantify.

4.1.1 Distance learning. Owing to lack of resources or reliable internet access can protect students from rural and underprivileged families. Lack of technology or sufficient network connectivity is a challenge to constant learning, especially for learners from underprivileged families (UNESCO, 2020b). UNESCO suggested using distance education programs and online learning and resources that schools and teachers can use to monitor and control learners to minimize disruption of education in response to closure caused by the COVID-19 (UNESCO, 2020c). Hundreds of libraries have temporarily closed to help alleviate the spread of COVID-19. It raises the challenge of maintaining distance learning for students without the internet at home.

4.1.2 Outcomes of student learning. School closures have an adverse effect on student learning performance. Schooling delivers vital learning, when schools are closed. Children and youth have limited resources for growth and progress. The drawbacks of underprivileged learners who tend to have fewer educational resources outside of the school are overwhelming (UNESCO, 2020b). Student break-out levels are steadily increasing because of the issue of maintaining that all students return to school after closures end. This relates in contrast to extended closure (UNESCO, 2020c). Schools are sources of cultural and individual interaction. When schools are closed, most of the children and young people will miss out on the social interaction that is vital for learning and growth. As schools are closed, parents are frequently expected to support children learning at home, and they can aspire to achieve this goal.

4.2 Tourism

India is focused on historical and cultural hospitality, drawing domestic and foreign nationals around the year. It comes as no surprise that a vast number of confirmed cases of COVID-19 in India involve foreign tourists. With visas being suspended and tourist destination being shut down for an indefinite period, it is expected that the entire tourism value chain that covers hotels, restaurants, agents, attractions and operators would suffer losses of thousands of crores. Experts think that a massive hit is likely to occur in the

tourism industry and may end up damaging the industry for the coming years (Muthukrishnan, 2020).

4.3 Aviation

Airlines are said to be functioning with pressure after the Government of India has indefinitely suspended tourist visa. Nearly 600 international flights to and from India were suspended for varying periods. Approximately 90 domestic flights were canceled, resulting in a dramatic decrease in airline process and prominent local routes (Muthukrishnan, 2020). Private airport operators have requested the government to permit to implement a small passenger facilitation fee on airfares to compensate for the rising cost of operation.

5. Social impact

5.1 Family dynamics: domestic violence and hobbies

Owing to lockdown and social distancing strategies to combat transmission of viruses have intensified threats of growing domestic violence such as physical, emotional and sexual abuse. The focus on spending time in shutdown ensures that vulnerable people are more marginalized to violence, and it is more complicated for them to look for support. To respond to the increasing concern, the government has to review, how to identify domestic violence, report or wherewith of all service available. Additionally, the coronavirus epidemic has severely impacted the online gaming sector. For several people who are self-isolating and staying at home within comprehensive government rules, online gaming has seen massive numbers of users arise that has helped several firms to elevate profit.

Figure 2 describes the COVID-19 outbreak in India between April and June 2020 was predicated on striking financial, real estate, and business services hard to compare with the same period in 2019. The cumulative effect of COVID-19 on the economy of the country throughout this period was calculated at more than 9% of gross value added (GVA) depletion.

5.2 Effects of global climate because of COVID-19

The development and severity of the COVID 19 outbreak response are unimaginable. A quarter of the world's population is lockdown with government around the world announce emergency, raise additional funds, and request significant changes in conduct from the citizens of the country to prevent the transmission of the virus. Year-on-year greenhouse gas emission is expected to drop specifically in 2020 as an outcome of sustained impact on economic activity. The longer these persist, the more significant the short-term carbon consequences. Whether it is a blip as observed in the financial crises in the year 2008–2009, or even the beginning of a longer-term decline, will rely on the economic policies that authorities put together to respond to such disruptions.

5.2.1 Role of IoT and sensors during COVID-19. To overcome all the issues addressed above, an extended period of social distancing should lead to greater dependence on automated solutions in various industries with the help of IoT and alarming systems. For instance, online shopping may see a significant boost with mobile technologies. Restrictions on travel implemented in many countries mean that millions of workers work from home with the computational technologies such as mobile learning, Web-based communications, etc. The timeline for a period of stability such as administrative work is extremely unclear. However, both governments and physical enterprises plan to return to business. In the short term, strategies to reduce the risk of COVID-19 should be addressed. One of the emerging factors, we can see changes from bio-metric enrollment to touch-free devices such as facial

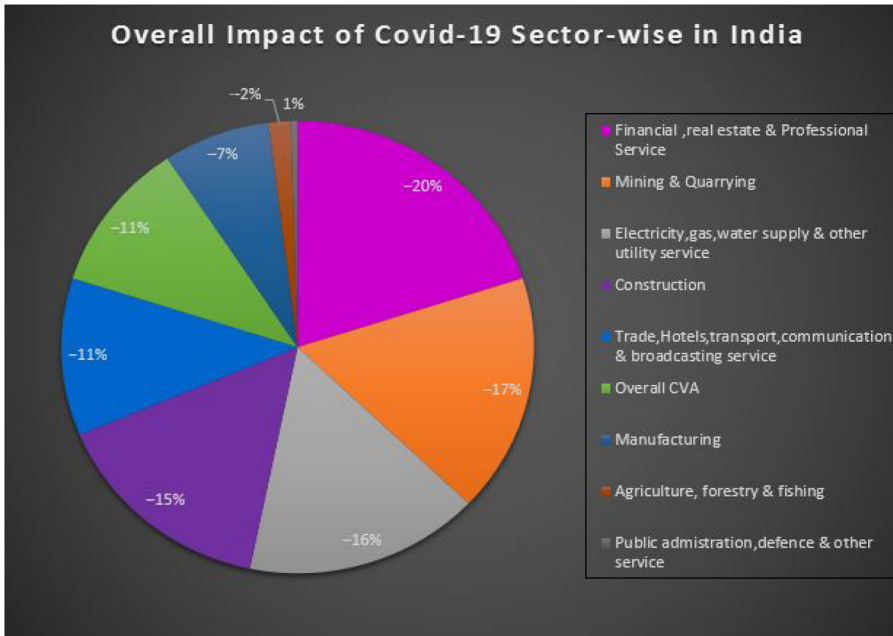


Figure 2.
Estimate impact of the COVID-19 on India from April to June 2020 gross value added

recognition. Ramco Systems is one of the endeavors that explore ways to decrease COVID-19 “surface area” in the office environment. The research laboratory of the Singapore Company has recently launched a facial time and attendance system (RamcoGEEK) that comprises temperature monitoring through a thermal imaging technology embedded in an accessibility control screen and an IoT screen. The latter will limit access to workers and guests with high temperatures.

The IoT and sensor devices can also cumulatively track the activity of the high-temperature workers in the office and deliver notification to management and HR. While such cases can be used to improve IoT utilization, the immense economic impact of the outbreak could also unquestionably force many organizations to prolong the investment in technology such as IoT application. In 2019, a study report by corporate executives to support digital orbit executive briefing, 58% of respondents said that they are going to spend significant resources in the deployment of IoT technologies, contrasted with only 4% of respondents planning to allocate little or no money. Moreover, COVID-19 influences the number of resources for IoT and other disruptive technology. New technologies may also be impacted inside the market. For example, specific IoT applications have already a drive to move analytical skills from the cloud to the edge, a design that reduces latency and facilitates more rapid response time. Edge processing always enables essential applications to perform even in the loss or depletion of internet connectivity.

6. Conclusion

With the challenges of a new recession and economic crisis, vital situations such as these are calling for powerful and effective policy making in Health, industry, government and

community. Instant, but well-planned support measures have to be initiated and adapted for those who can drop through the cracks. Mid- and long-term strategies are required to stabilize and motivate the economy during this recession. A comprehensive social-economic development strategy that consists of infrastructure and sector-by-sector schemes that supports business to ensure the success of those with reliable and sustainable business models.

References

- Choudhary, S. (2020), "Covid-19 impact: domestic demand for petrol, diesel, ATF and shipping fuel drop 10%", available at: <https://economictimes.indiatimes.com/industry/energy/oil-gas/domestic-demand-for-petrol-diesel-atf-shipping-fuel-drop-10/articleshow/74681471.cms?from=mdr>
- Das, G. (2020), "136 million jobs at risk in post-corona India", Livemint, available at: www.livemint.com/news/india/136-million-jobs-at-risk-in-post-corona-india-11585584169192.html
- Goyal, S. (2020), "What is the impact of coronavirus on Indian economy?", available at: www.jagranjosh.com/general-knowledge/what-is-the-impact-of-coronavirus-on-indian-economy-1582870052-1
- Goyal, M. (2020), "Covid-19: how the deadly virus hints at a looming financial crisis", The Economic Times, available at: <https://economictimes.indiatimes.com/news/economy/finance/covid-19-crisis-how-the-deadly-virus-hints-at-a-looming-financial-crisis/articleshow/74752200.cms>
- Khosla, S. (2020), "Impact of coronavirus on the digital payments segment in India", available at: www.dqindia.com/impact-coronavirus-digital-payments-segment-India/
- Kumar, V. (2020), "Covid-19 and its impact on the Indian IT industry", available at: <https://industrywired.com/covid-19-and-its-impact-on-the-indian-it-industry/>
- Mahendra Dev, S. (2020), "Addressing COVID-19 impacts on agriculture, food security, and livelihoods in India", available at: www.ifpri.org/blog/addressing-COVID-19-impacts-agriculture-food-security-and-livelihoods-india
- Muthukrishnan, M. (2020), "COVID-19 and its impact on Indian economy", available at: <https://bfsi.életsonline.com/covid-19-and-its-impact-on-indian-economy/>
- Shah, A. (2020), "Sensex posts biggest gain in 11 years: investors richer by Rs 4.7 lakh crore", The Economic Times, available at: <https://economictimes.indiatimes.com/markets/stocks/news/sensex-logs-biggest-one-day-gain-in-11-years-investors-richer-by-rs-4-7-lakh-crore/articleshow/74810933.cms>
- The Hindu Business Line (2020), "Covid-19 lockdown estimated to cost India \$4.5 billion a day: acuité ratings", The Hindu Business Line, available at: www.thehindubusinessline.com/economy/covid-19-lockdown-estimated-to-cost-india-45-billion-a-day-acuité-ratings/article31235264.ece
- The Indian Express (2020), "Stock markets post worst losses in history; sensex crashes 3,935 points amid coronavirus lockdown", The Indian Express, available at: <https://indianexpress.com/article/business/market/bse-sensex-nse-nifty-stock-market-live-updates-coronavirus-global-markets-6327415/>
- The Indian Express (2020), "We should plan for negative growth rate this FY, says Arvind Subramanian", The Indian Express, available at: <https://indianexpress.com/article/india/express-adda-live-updates-arvind-subramanian-coronavirus-economy-recession-india-lockdown-6382855/>
- The Times of India (2020), "World bank sees FY21 India growth at 1.5-2.8% – slowest since economic reforms three decades ago", The Times of India, available at: www.thehindu.com/business/world-bank-sees-fy21-india-growth-at-1-5-2-8-slowest-since-economic-reforms-30-years-ago/article31322011.ece
- UNESCO (2020a), "COVID-19 educational disruption and response", UNESCO, <https://en.unesco.org/covid19/educationresponse>

UNESCO (2020b), "Adverse consequences of school closures", UNESCO, available at: <https://en.unesco.org/covid19/educationresponse/consequences>

UNESCO (2020c), "290 Million students out of school due to COVID-19: UNESCO releases first global numbers and mobilizes response", UNESCO, available at: <https://en.unesco.org/news/290-million-students-out-school-due-covid-19-unesco-releases-first-global-numbers-and-mobilizes>

Further reading

Webadmin (2020), "The covid-19 pandemic and Indian agriculture: a note", available at: www.mssrf.org/content/covid%C2%AD-19-pandemic-and-Indian-agriculture-note

Corresponding author

R. Jothikumar can be contacted at: jothikumarcse@gmail.com

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgrouppublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com

Reproduced with permission of copyright owner. Further reproduction prohibited without permission.