



LIT POLICYTHON PAPERS

SUSTAINABLE TECHNOLOGY

EDUCATION TECHNOLOGY

ARTIFICIAL INTELLIGENCE



Veritas et Aequitas



STUDENTS FOR LIBERTY
A F R E E R F U T U R E

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TEAMS

Sustainable Action Squad

- Maria Charles
- Merlin Thomas
- Sandra Binu Varghese

Solution Sellers

- Harsh Kadara
- Jame Thomas Mathew



Policy Panthers

- Samarth Khurana
- Arham Jain
- Adithya Beera

Government of India

- Shreethigha
- Neha Susan Cherian
- Sajusha Ashok

Nihvana

- Niharika
- Nivruthi

Team Creva

- Akshita Grover
- Sidhant Mathur

The Invincibles

- Yashasvi Chaudhary
- Rhea Rose Kappan
- Allen Mathew



Reduction of dependence on fossil fuels

- Sustainable Action Squad

A significant reduction in dependence upon fossil-based energy cannot be accomplished in a short time frame with the introduction of renewable sources of energy alone. A synergistic approach to the problem must be undertaken which also includes increased efficiency of policy, processes and practices used in production. You need to ensure that the policy has an impact on outcome, output environmental effectiveness, cost efficiency, administrative burden, transaction costs, Sustainability, flexibility, predictability, acceptability, etc.

Problems Identified

Even though it is evident that we are trying to aim for a net-zero emission to stall Climate Change, delving into the specifics we would like to point out these Key-Problem Areas

- Wastage of materials & energy in Production
- Prevalence of Substandard products due to emphasised focus on quantity sold over quality of product.
- Negative impact on environment due to wastes during production, energy consumption, transport processes and packaging

Solutions

3-Pronged System

This model aims to bring producer autonomy to the products and made accountable in their handling. These 3 methods look at transferring the ownership of materials, services and all allied processes to the manufacturer/producer.

1) Product-as-a-Service (PaaS)

Subscription based services allow companies to maintain ownership and derive profit from their assets for as long as possible before they reach end-of-life.

One of the biggest industries to capitalize on this trend is home and office furnishings. Industry giant Ikea is leading the way by announcing it will test furniture leasing programs in 30 markets starting in 2020. Based on company research done in Poland, Sweden, Switzerland, and the Netherlands, they will be aiming services at consumers who dwell in rented spaces, expatriate workers, small enterprises, and university students.

For example, shifting from selling cars to providing vehicles as a service can create new revenue streams for the automotive industry and capture the value of more intensive use of each car. Innovative vehicle design to make maintenance easier and boost fuel efficiency. The Helsinki Model where all of the types of transit systems were integrated into one platform, and the user had to enter the Pick-Up & Arrival Destinations to be hailed by the suitable transportation.

2) Tracking technology



The circular economy requires asset tracking technology to achieve efficiency. For maximum utilization and profitability, businesses must know where their products are at all times. In a circular business model for furniture, the company keeps eyes on their product from birth to disposal which—if properly maintained—could last as long as a decade or more. Mobile IoT can be used to track products within circular business models.

The ability to monitor thousands of furniture assets over long periods of time and wide geographic areas is an ideal use case for Mobile IoT technology. Furniture rental companies can use GeoTraq's penny-sized Mobile IoT Tracker-Modules for asset management. GeoTraq modules are designed to use very little battery power and provide scheduled location reports for up to 10+ years. This feature allows products to remain actively inventoried and utilized while in circulation. This system yields a return on investment well beyond that of a one-time purchase.

Mobile IoT will help facilitate more industries joining the circular economy. It is an excellent way to future proof business models for long term sustainability.

3) Take back & Refurbishing Systems

Take back Systems focus on buying back the product from the customer, backed by the tracking technology as mentioned in the 2nd pointer. It incentivizes the customer by also guaranteeing a fraction of the price back when handed back. This ensures the Closed Loop production of the product, as the final product is retained into the production chain for reuse in the new cycle.

Whereas the refurbishing model focuses on the maintenance of the product especially for durables like furniture that could be modified and made fit for use again, but still preserving the appeal to it.

Energy Management Systems

Energy, in the context of organisational use, can be defined as the direct consumption of fuel (Gas, Oil, etc.) and indirect consumption of fuel (Electricity) required to perform the organisational functions. It is a strategy of adjusting and optimising energy, using systems and procedures so as to reduce energy requirements per unit of output while holding constant or reducing the total costs of producing the output from these systems. Thus EMS leads to the judicious and effective use of energy in order to maximize the profits by reducing the operational costs and hence enhance the competitive positions. Energy management systems are used by power system operators to monitor power grid operating conditions and control grids in a reliable, secure, and economical fashion. An energy management system interfaces with the grid through a supervisory control and data acquisition (SCADA) system. The SCADA system transmits thousands of measurements at critical points of a power system in real time to the energy management system and command signals from the energy management system to field devices to take control actions.

An energy management system integrates application software such as state estimation, contingency analysis, automatic generation control, and economic dispatch. These applications typically operate the grid in a reactive (e.g., load following) or preventive (e.g., security constrained dispatch) fashion.

The successful case of JK Lakshmi Cements in garnering energy efficiency through the Perform, Achieve & Trade Scheme of the Bureau of Energy Efficiency to be granted tradeable Certificates



for achieving set targets for energy efficiency is something that can be replicated to the individual level through deliberation and a tailor-made Authority under the State Electricity Boards of India.

Biotechnological Extraction Processes

Through the "biotechnological extraction process" recycling with specialised bacteria with the aid of harmless bacteria, we are able to recover gold, for example from ground platinum waste or shredder dust (shredded and ground electronic waste). The bacteria comes from ore deposits, i.e. the natural sites where the precious metal is found. They have evolved to tolerate relatively high amounts of metals in their habitats. In fact, they have even developed the ability to dissolve gold particles, which we use to extract them in a process we call "bio-extraction". Using the process, which is suitable for recycling companies for instance, the same amount of gold can be recovered with lower carbon emissions than with conventional recycling methods. Similar biotechnological extraction processes are also conceivable in other areas: in the steel and metals industry, hundreds of millions of tons of dust, sludge and ash are generated each year, all containing precious metals that could be channelled back into the production cycle.

Closed-Loop Production Practice

India being projected to undertake construction activities on the shoulders of ambitious infrastructure projects and schemes like AatmNirbhar Bharat, to ensure that the most sustainable way is led, a closed loop Production System where the raw materials deemed as excess/ wastage are properly segregated and reverted back to the production process.

Limitation of Implementing

Pricing will be an issue with underprivileged, but in the macro perspective the new initiatives that employ more human resources would contribute greatly to the overall purchasing power of the Economy that then is on the path of Sustainable Growth, by feeding into each other.

Recommendations

Stakeholders

- Citizens - More Personal Disposable Income, Personalized Services
- Businesses - Improved customer relations: Recurring services for the customer enables the Business to cater to their specific needs, that were inaccessible if the customer were to
- Environment - Overall reduction in wastes due to which carbon footprint.
 - I. Comparative low taxes for choosing PaaS over the same Product in the Linear Economy model as an incentive.
 - II. Incentivizing Corporates to handover office Conclaves, in Techno Parks, IT Clusters etc. to PaaS for Energy Management Systems and Building Solutions
 - III. Opening pilot centres to engage in Trackers for durables and gauging their performances and focussing attention on regional basis and establishing databases and collaborating with MSME's in the electronics sector for more proliferation.



IV. Stakeholder consultations and feasibility enquiry into tradeable rewards system to be applied in various non-commercial sectors.

V. Retraining Site Supervisors & Employees on Closed Loop Practices to segregate surplus materials to revert back for construction





Policy for Environment Protection and Climate Change

- Solution Sellers

Objectives

- Reduce CO2 levels to 42 gigatons
- Limiting global warming levels to temperature lesser than 2 degree Celsius in this century
- Reduce the number of adverse climatic conditions across the globe.

Mission

To develop a policy that can not only make use of renewable energy sources but also find mechanisms to reduce pollution levels in a day-to-day basis.

Problems Identified

- The pollution levels in most of the cities is triggered by the emission from motor vehicles that run on fossil fuels.
- The industrial emissions also contribute to air and water pollution across the globe.
- With population increasing day by day the pollution levels are proportionately shooting up. The idea is the number of individuals contributing to pollution is increasing.
- Ground area available to plant trees are decreasing.
- The behavioural patterns of individuals are ignorant towards rising pollution and climate change.
- A transition from conventional to non-conventional sources of energy takes time and money.
- There is a threat of natural disasters in many parts of the world. The disaster management systems of countries are inefficient.

Solutions Identified

1. Public Transport Facilities

- The number of vehicles on road contribute to higher levels of pollution. More number of people using the public transport facilities will reduce the emission level.
- Increasing the number of buses or trains will never solve the problem. Measures to attract common man to use these facilities have to be ensured.
- The facilities provided must be affordable, clean, and must provide comfort to passengers. In this way the number of passengers is to be increased.
- In some regions it has been identified that people have a sense of dignity in using their own vehicles and shifting to public transport is not accepted by them. Incentives like reduced costs for daily passengers and increase in price of fossil fuels can alter their behaviour patterns.
- Platforms for awareness will be organised to convince individuals on the threat the earth is facing and how their actions can make a change.



- Increasing the area, the public transport facilities cover will also reduce emission levels.
- As the number of passengers start rising, investments will be made to switch the public transport facilities to be eco-friendly thus again reducing pollution.

2. Afforestation

- Afforestation has been identified as a potential solution to climate change. Even though a simple solution, planting a greater number of the right trees still remain a challenge.
- To increase the ground area available for planting trees, further investments made on infrastructure will focus on space utilisation. Construction companies that develop plans of eco friendly infrastructure will be provided tax concession.
- Taking example from Gulf countries, taller buildings will be constructed to maximise ground space utilisation. The ground area developed in such a manner will be used only for the planting of trees.
- Some trees like banyan and neem have been identified to have high air purification capacities. Local Self Governments will be provided monetary support to find space and plant those trees.
- It has been identified that the number of trees being planted is very high but later on they are not being conserved. Organisations which do not conserve the trees they plant will be penalised for their ignorance[applicable for government bodies as well].
- Technology has identified methods to grow trees without soil. Startups which put forward innovative ideas on this aspect will be funded by the government.

3. Internet and Technology

- Internet has been regarded as a basic right by organisations and courts all over the world.
- This policy aims to publicise the use of internet in all aspects to combat climate change.
- Investments will be made to increase the availability of internet facilities in rural parts of the globe.
- Tertiary Sector enterprises across different parts of the world will be given tax concessions if they promote WORK FROM HOME. This will make an impact as the proportion of workers in the tertiary sector is growing exponentially. Making them sit at home and work will reduce pollution efficiently.
- Awareness on health problems due to pollution will be widely circulated to different online platforms to bring a change in the behaviour of individuals.
- Online platforms which replace buildings that earlier took a lot of area will be promoted by government funding.

4. Renewable Energy Sources

- A team of experts from different fields will be formed to study the methods and possibilities of publicising renewable energy sources.
- In regions with high diversity, the teams formed will function on a case to case basis.
- Domestic companies which develop machinery that functions using renewable sources will be extensively funded by the government.
- Regional governments will be given budgetary support to start Corporations that supply electricity from renewable sources.
- Infrastructural development will be directed to maximise the usage of renewable sources.



5. Influencing Behavioural patterns

- The above solutions can be effectively applied if the individuals start bringing changes in their lives. Different from other policies, the stakeholders of this one is each and every human being. This message has to be inscribed in the minds of individuals. Awareness campaigns will be conducted on a wide basis to make behavioural changes.
- The term household used in economic concept will be replaced by families. Families will be provided benefits like tax concession, cheaper access to basic necessities of life, and other incentives if their actions contribute to environmental benefits.
- Local bodies through online portals will be enforced to record the energy consumption details of families and rank them on the same basis. The top ranking families will be given the benefits.

Implementation

1. Legislature

- The government will take initiative to discuss the possibilities of environmental development without harnessing the economic growth of the country in the Parliament
- Higher proportion of government budget will be directed towards environment friendly projects.
- A new department will be setup in Local Body levels to ensure that the solutions are implemented in every part of the nation.
- An Environment Task Force will be organised to study the new possibilities of nature protection. The Force headed by a Minister will also evaluate application of methods which were proved to be successful in a local basis
- The Disaster Management System will be modernized to ensure quick action in case of a calamity.

2. Judiciary

- Courts dealing with Environment related cases will be setup in every district.
- An expert panel of Judges will be setup to make laws regarding Environment Protection. The panels will be setup in every state to avoid a uniform law in a country with high geographical diversity.
- The penalties on law breakers will be framed such a way that the mistake won't be committed again.

3. Education

- Environmental studies will be inducted into the syllabus of all classes.
- Environmental workshops will be conducted in all educational institutions.
- Students in lower classes will be trained from the very beginning to take care of the environment. Studies have proved such training will leave an impact on students as they grow.

Impacts of the Policy

1. Government



- The government will have to reallocate its budget activities from other fields to environment
- Forming new groups and panels to study the issue requires the need to follow efficient selection criterion
- As the policy involves influencing behaviour of individuals, the government must ensure no particular group is left behind in the course of implementation.

2. Society

- The society will benefit if the policy is implemented with perfection.
- There is a chance of spread of fake news about the policy which must be countered.
- The health conditions of individuals will become better with a cleaner nature
- There are chances of an economic slowdown during the transition from conventional to non-conventional resources. This will be temporary
- More investment by government in different sectors will lead to more employment opportunities.

3. Externalities

- Many unintended positive results can be expected from the policy.
- The effects of these externalities can be measured only in the future

Overview

The above policy has been formulated such a way as to ensure that with minimum investment, maximum benefits are yielded. The economic costs of the solutions are not very high if the budget is allocated efficiently. The policy do not focus on forcing the individuals to change their behaviour but it tries to influence the daily activities of individuals through incentives. Emphasis has been given on decreasing the number of vehicles on road and increasing greenery on the planet. Even though these were already in place the policy has laid down a few steps to publicise these activities. The challenge of influencing behaviour patterns have been addressed by making optimum usage of the technology available. The implementation of the policy will be done through the channels of legislature, judiciary and educational institutions. The benefits offered by the policy outweighs all loses and will be visible in the coming years.



Bridging the Educational Digital Divide

- Policy Panthers

With almost all modes of interaction now being ‘ZOOMed’, COVID-19 shed light on the breadth and depth of the digital divide, especially as educational institutions operate remotely. While well-endowed institutions were able to shift to the digital medium, a majority of the institutions, including 78% of schools, being run by the government are struggling to tackle the crisis.

Even as this disparity in the virtual world threatens to widen educational inequalities, we must remember that the digital divide persists even without a pandemic. In a society in which we are defined by our access to information, what we earn is what we learn. Anyone without adequate access to technology will simply be left in the digital dark ages.

This policy brief aims to present the current educational context, investigate the existing challenges and delineate a multi-pronged strategy to remedy the educational digital divide both immediately and in the medium-long run.

The Context: Causes and Challenges

The pandemic induced shift to digital learning has underscored the deep digital divide that exists in our country. The digital divide, which refers to the gulf between those with access to computers and those who do not, is a multi-faceted phenomenon resulting from many interrelated problems.

One of the crucial problems faced especially by the poor is the high initial cost of going digital owing to expensive hardware. While smartphone penetration stands at 31.7% in 2020, only 10.7 percent of Indian households have computers (including desktops, laptops and tablets).

This is coupled with high operating costs due to expensive access to the internet (in relation to the poverty levels of India) leading to only one in four households having any form of internet connectivity. Expensive access to the internet stems largely from the fact that around 30 out of every 100 rupees of revenue from ISPs is taken by the government; primarily through 18% GST, 3-5% as spectrum usage charges and 8% licence fees.

These issues are compounded by low broadband reach in rural areas, staggered and unreliable power supply, language barriers to accessing the internet and low levels of Digital Literacy. Under digital literacy we face two key problems: the inability of the students to adapt to the digital medium and the difficulty faced by educational institutions themselves in learning to use technology and adapting their pedagogy to the digital medium. Apart from this, 50% of people with fixed broadband and 40.2% of those with mobile internet face connectivity issues that render them unable to access resources despite having the hardware and knowhow.

The digital learning space, which acts a source of skill development for non-urban people, is tightly controlled by the UGC which permits only the top 100 NIRF ranking institutes or those with a NAAC grade of 3.26/4 to introduce online courses. As of 2020, only 7 institutes from the eligible list have introduced online courses. Moreover, ambiguities continue to exist whether EdTech platforms are legally ‘e-commerce’ entities to be regulated the same way as Amazon.



The digital divide is characterised by three main fault lines – between urban and rural, rich and poor, and male and female. While the first two are intuitive, role of gender is underemphasised. According to the Internet and Mobile Association of India, of those who had access to the internet, 67% were men while only 33% were women. Male favouritism often manifests under resource scarcity, for example, in a family with only one computer, a male child's online education might take precedence over the female child's studies.

Given all these challenges, the MHRD presented the Alternative Academic Calendar (AAC) that consists of guidelines to conduct school education online in the 2020-21 academic year. Though AAC accounts for ordinary mobile users, it does acknowledge that not all students may have smartphones. It instead calls on the teaching community and students to find alternatives while suggesting that teachers could monitor students through calls or SMS. By doing so, the AAC seems to assume that a substantial section of students has access to the internet and smartphones and underestimates the effort required to monitor each student by call.

Lessons from Maharashtra

To lay bare the ground realities of digitalised education, we must study Maharashtra which undertook efforts to digitalise government schools from 2015 under the Pragata Śaikshaṅika Maharashtra programme. Given its 5-year head start, Maharashtra should have ideally fared well during the pandemic, but that was hardly the case.

Though the number of 'digitalised' schools witnessed a three fold increase from 2016 to 2019, there was no clear definition of 'digitalisation'; hence any school that possessed a computer or a projector was deemed 'digital'. As a result, though many students, as per records, have taken ICT classes, improvement in digital literacy and its present use value stands questionable, especially since only about 20% of rural students in Maharashtra have smartphone access.

Though efforts were made to make teachers digitally literate, it was not clear what was expected of them. Teachers were allowed to self-certify themselves as digitally literate and many 'digital' teachers struggled to adapt to COVID and continue to misconstrue digital education with audio-visual representation of textbook content.

Since 2015, Maharashtra government has been urging teachers to proactively contribute to online educational libraries like DIKSHA, which was heavily promoted during the pandemic. However, effective educational content creation needs specialised knowledge of digital tools in addition to knowledge of curriculum. Therefore, such steps have only resulted in a deluge of teacher-made, yet un-curated material that adds little value to students.

Given this, the AAC guidelines for online education, even in the digitally-ahead Maharashtra, seem implausible to achieve on a broad scale, let alone in other infrastructurally weaker states.

Potential Policy Solutions

Solving any problem regarding the educational divide entails taking a holistic view to correct the broader digital divide. Digital education is only complementary to conventional dialogue and interaction based education. However, this does not discount the importance of digital access to



the self-actualisation of each student through the ocean of resources and opportunities available online.

The current scenario warrants both immediate solutions to the COVID induced crisis as well as medium-long term solutions to correct the digital divide.

Immediate Steps:

Since TVs have a better reach than the internet, standard educational lectures to school students can be broadcast on multiple channels, especially for the lower grades where parents play a key role in education. In addition, the government can explore zero-rating, a practice that allows consumers to use a website without any financial cost. The government can bear the cost to give the underprivileged sections free access to state maintained online educational libraries like DIKSHA which hosts textbooks and recorded classes.

However, as mentioned, digital educational content needs specialised expertise and the government must take the lead to develop and expand curated content. It must explore skill development opportunities to teachers that enable them to produce quality content while receiving monetary benefits. E-pathshala, another government undertaking which hosts compressed educational content must be integrated with DIKSHA to remove confusion and broaden reach.

Along with this, the government must undertake adequate publicity measures to spread word to potential beneficiaries. Surely, these policies do not entirely correct the immediate divide, but given the situation of state finances and the fact that schools would open in a few months, it is wiser economically to not allocate undue resources to short term fixes to education while risking economic mismanagement.

Medium to Long Term Measures:

Phones and tablets with a minimum set specification and below the Rs1500 threshold can be exempted from taxes to spur innovation and reduce device acquisition costs. Spread of devices in this market segment would also necessitate manufacturers to incorporate local languages into their software which will have a ripple effect on the digital ecosystem.

Information shouldn't be costly. Reducing GST on ISPs to 5% gives room for ISPs to consolidate their networks and expand to villages while reducing internet charges and connectivity issues. This would also have other positive externalities including, but not limited to, improvement in financial health of India due to reduction in debt-burden of telecom companies and most importantly, economic growth arising from the spread of the internet, essentially a more robust and comprehensive version of the Jio Revolution.

Regarding digital literacy, toll free number for queries must be made default with all mobile phones. Anganwadi workers can be made digitally literate and their scope can be expanded to increasing digital literacy. Since anganwadis primarily engage women, this would partially correct the skewed gendered access as well.

NISHTHA, the central government's program with the mandate of training teachers must be used effectively to build core digital competencies. To avoid what happened in Maharashtra, digital-



literacy for teachers must be clearly defined and teachers must be given systemic training in line with norms for accreditation to ensure consistency in skills of teachers.

Teachers must be made aware of the challenges of the digital medium and empowered with undertaking the necessary pedagogical changes to meet the challenge. Similarly, digital literacy must be defined and evaluated on stronger terms among students than merely attending a school with a computer.

In the domain of online courses, allowing more universities to offer online education can pave the way for innovation and accessibility. Instead of pre-emptive regulation, the government must opt to review platforms through outcome-based parameters to ensure quality control while giving institutional stakeholders the room to operate. Enabling competition reduces cost and offers variety, catering to different sub-segments of the market.

Reports project that online education services across K-12 will increase 6.3 times to \$1.7 billion by 2022 while post-K12 market is set to grow 3.7 times to \$1.8 billion. New platforms utilise AI and VR to improve educational outcomes in novel ways. For example, some startups offer virtual laboratories to students which are extremely useful in taking knowledge to institutions that cannot afford to maintain a physical laboratory.

Given the pandemic and the fact that India is the second largest EdTech market, the government must capitalise on the opportunity to promote development and export of Indian educational content. This would both ensure quality control in line with international standards and bring in forex. The key to this lies in creating a new policy for online education platforms, differentiating them from e-commerce sites.

Feasibility

COVID 19 brought economy to a halt while the government is being forced to substantially breach its fiscal deficit to keep the economy and the under privileged sections afloat: Economy grew at -23.7% and -7.5% in the April-June and September 2020 quarters while recent estimates suggest a fiscal deficit above 7%. Given this, we must focus on achieving the most with less. Though zero-rating some websites, exempting a section of phones from taxation, maintaining a Digital Library and reducing GST slab might reduce revenue in the short run, the opportunities digital access provides will offset the losses through increase in taxes arising from growth in the economy.

Given that India has the cheapest data service in the world, the government, by zero-rating key websites, might not incur significant costs: an article by Nikhil Pahwa estimates that providing 1gb of free data per user per month would cost Rs7 to the government, for 400 million users, it would cost only Rs280 crore. The government must do so despite low prices because we cannot expect all the underprivileged sections to proactively buy data due to human inertia and because data is usually sold in larger, more expensive quantities. Training anganwadi workers, framing a new EdTech policy and creating standards for Digital Literacy are feasible solutions as well.

Conclusion

Digital access is an essential tool for every student's self-actualisation, and under COVID, it has become necessary for basic education as well. Temporary, yet agile adaption of classes to TVs,



zero-rating and consolidating online educational libraries can immediately, yet partially solve the current educational crisis. However, proactive government steps to reduce acquisition costs, freeing up the telecom tax regime, laying ground work for EdTech companies while strategically deregulating the online education market can work wonders to digital education in specific and to the quality of education in general for India.





Education loss due to the Digital Divide: A Case for Better EdTech Policy.

- Government of India

The pandemic-induced education crisis has consistently degraded the quality of education in India, risking desirable socio-economic conditions for the upcoming generation. On this account, our solution is two-pronged: reducing the need for constant internet accessibility and enhancing the quality of online education.

Scope of the problem

The lockdowns necessitated by the COVID-19 pandemic upended the lives of more than 37 million students in India. As classes moved online, the class, caste and gender faultlines in India's education landscape exacerbated the existing divides in the penetration and use of education technology.

Internet infrastructure is simply inadequate to accommodate the needs of all varieties of learners. The disadvantage in access to technology dovetails with traditional gender and caste deprivations. The challenge is to devise an educational policy that consciously mitigates the accumulation of disadvantages.

The approach towards ensuring that 2020 was not a zero academic year was largely spearheaded by state governments. Although these had the advantage of providing education in regional languages to suit local conditions, they were patchy at best. Use of cable TV and DTH to screen videos does not ensure or test if students retain concepts. Although the central government encouraged the use of NISHTHA, DIKSHA, SWAYAM etc, these are all predicated on prior access to Internet connection and devices. They also do not address the lack of computer literacy or the variable access to resources within households.

Policy alternatives

With education being made contingent upon computer literacy, India as a country stands to lose a lot. On this account, curricular classes that enhance digital literacy need to be implemented.

Owing to preconditioned gender roles in society, there is a stark gender divide in internet accessibility. It is important to sensitise families to the importance of education regardless of the gender of the child. However, it is not enough to ensure change. On this account, schools that have more than 20% of the students without internet access must rearrange school or class timings in such a manner that the timings of the various standards do not clash with each other. This way, households that have one or few devices to use for online education do not prioritise the male child(ren) in the family. This suggestion raises the question of the class hours being restricted for all standards since the timings of 12 different standards cannot be fit into 24 hours without overlap. However, this problem further paves the way to reduce the duration of online education where students mind-numbingly attend lectures, and subsequently screen time, mental stress and eye strain on students. Instead, offline assignments must be increased.



For students from households that do not have devices or internet access at all, the government must map centres, such as Kendriya Vidyalaya schools, where students with zero access to online education can access materials and recorded/live classes in the computer lab. This was successfully implemented by IIT Madras in December for its students' final exams. In the case that such centres are not feasible owing to the lack of infrastructure or lack of centres themselves, the government must form Public-Private Partnerships (PPPs) with private centres like TCS ION to provide local centres to access online education. These centres will be useful in the case of the digital literacy classes mentioned above. The government can further establish partnerships or sign MoUs with private tech giants in India, such as Reliance Jio, which can provide devices to the students below the poverty line or with complete lack of access to the internet. This step will boost local manufacturing and domestic businesses, in line with the government's Make in India campaign. Alternatively, schemes like the Karnataka government's Vidyagama programme can be implemented, with due COVID protocols to provide offline education.

The long term goal should be to reduce the need for online classes, with the pandemic coming to a close with the availability of vaccines.. It is important to understand that merely enhancing accessibility does not improve the situation; it rather produces a whole generation of burned-out, partially visually impaired individuals. The aim should also be to improve the online learning experience in a way that makes knowledge retainable.

A recommendation to this end would be increasing offline assessments and decreasing online lectures as stated previously. A further recommendation is to introduce NPTEL (National Programme on Technology Enhanced Learning), an initiative by seven IITs, using which students can access recorded lectures. The platform can be adapted to facilitate easy downloading of lectures. Currently, NPTEL consists only of English lectures but regional material can be developed to enhance education for students. On similar lines, podcasts on platforms like Spotify can also be introduced to ensure that students with access to the internet and different learning requirements can learn at their own pace.

Recommendations

1. Schools that have more than 20% of the students without internet access must rearrange school or class timings in such a manner that the timings of the various standards do not clash with each other.
2. The government must map centers, such as Kendriya Vidyalaya schools, or establish PPPs and MoUs with private firms like TCS ION, where students with zero access to online education can access materials and recorded/live classes.
3. The government must increase the priority of students for vaccination, given that they are the future of the country
4. Curricular classes on digital literacy need to be implemented.
5. Offline assessments must be increased and online lectures must be reduced
6. NPTEL courses and podcasts must be introduced in english and regional languages to enhance the quality of online education.



Digi-Gurukula

- Nihvana

Education is the passport to the future, for tomorrow belongs to those who prepare for it today

~ Malcolm X

Education, being the foremost factor in propelling a country towards development, acts also as a catalyst for implementing the most fundamental tenets of democracy like equity, equality, justice, and liberty, all of which can be found outlined in the Indian Constitution alongside futuristic provisions for the Indian Education System. It is evident from these provisions that Independent India has, for long, aspired to bring forth a model of education that creates a strong and lasting impact on its people. The very existence of the Right to Education as a Directive Principle of State Policy, and further, its manifestation as Article 21A, under the Right to Life no less, is evidence of the strong connect between the Indian people and their education system. It is in this light that the present challenges to education in the country, and especially to edu-tech, are dealt with in this policy memorandum with utmost reverence to the tenor of the Indian commitment to the cause of education.

Challenges

The Constitution makers envisioned an India where every child has access to education “within the limits of its economic capacity” under Article 41. It is this barrier of economic capacity that the education system has been combatting over the past many years, and the advancement in technology, aided by the advent of globalization, has left a sizeable portion of the population without access to education. The lack of requisite technology to access education has proved to be a daunting issue during the COVID-19 pandemic in the light of the sudden and massive shift to online learning.

This policy aspires to meet the challenges faced by students and other stakeholders in the education sector on two fronts- it deals first with systemic issues that have plagued the education system for long, and merely made a transfer from the physical to the digital realm in the past year. It deals also with COVID-induced issues in the education sector that made the digital divide most prominent in terms of access to education.

Systemic Issues

A lack of access to education perpetuates poverty as education increases employability and disperses knowledge about fundamental rights that aids in curbing exploitation on many fronts. The lack of education leads to the birth of a **vicious cycle of poverty** in the country that can only be broken by providing education. A massive **divide in the formal and informal sectors** of the workforce in terms of regularised income and socio-cultural standing is both a cause and an effect of this cycle remaining unbroken.



This is only aided by the **lack of dignity of labour** and extreme differences in monetary remuneration awarded to workers in the two sectors. The scientifically illiterate, or barely literate are excluded from consideration for employment in the formal sector on these grounds.

Lack of education pushes the poor to become impoverished, which places more challenges to the education system. It may be argued that **socio-cultural repercussions** like continuing discrimination on the grounds of caste and gender plague the system and society due to this. The girl child, often prohibited from going to school or withdrawn from primary school itself, faces discrimination even at school where there exists an inherent bias based on gender. This leads to reiteration in the social standing of women within the system. The inclusion of non-binary genders in the education system is negligent.

On similar lines, **caste minorities are excluded** from the mainstream education system to a large extent despite the provision of reservation of seats. The National Family Health Survey 2015-16 depicted that 45.9% of ST members in the country are in the lowest wealth bracket. 26.6% of SC members and 18.3% OBC members share this status, as opposed to a mere 9.7% of members of other castes. These citizens continue to face oppression in access to education, only accentuated by the sudden move to digital education in the pandemic.

COVID-Induced Issues

While all these systemic issues, in some way or form, made an immediate transfer from the physical realm of education to the digital realm, they were accompanied by a set of new challenges for the economic and social minorities. The sudden and compulsory need for investment in gadgets and internet connections, coupled with the loss of income due to the pandemic was, perhaps, the most daunting challenge. Parents' inability to provide a device for the student to attend classes lead to many a student suicide in all parts of the country.

The sudden loss of the midday meal service also forced caregivers to direct funds towards buying food, which left lesser amounts for investment in education and gadgets. Even for those who could afford a low-end device, intermittent internet service and lack of electricity proved to be an issue according to many studies.

Lastly, when parents could only afford one device in a family with multiple children, it was inevitable that only one or two children could attend classes regularly. It was noted that the girl child was never prioritised in these cases.

Proposal

Article 21A of the Constitution pledges that the State shall provide free and compulsory education to all children between 6 and 14 years of age. In this spirit, and based on pre-existing policies introduced by the government and other international agencies, the Digi-Gurukula policy is a multi-stakeholder approach to fulfil the rights to education and equality immediately during the pandemic, but also sustainably after the pandemic. It attempts to take into account the diverse demography of India that has faced the aforementioned challenges posed by the digital divide.

Title and Extent

This policy, entitled Digi-Gurukula, shall extend to the whole of India.



Definitions

Stakeholders: Citizens of India, including but not limited to students, parents and other caregivers, teachers and other school leaders, NGOs, donors, and the private sector (in accordance with the World Bank's Digital Education Strategy)

Citizen: A citizen of India under Article 5 of the Constitution

Government: The Central Government, State Governments, Municipal Corporations, and other Local Self-Governance Bodies

Student: Any person enrolled in any school recognised by or established and functioning under the Government

Volunteer: Any member of the student's family that is enrolled in the Digi-Gurukula system as a volunteer to work under the government pledges part-remuneration to the student's education

Criteria of application as Volunteer

- i. Citizens with at least one child in their family enrolled or to be enrolled in Government schools within the next one year.
- ii. Citizens aged 18 years or more.
- iii. Citizens whose family income does not exceed Rs. 27,000 per annum.

The Digi-Gurukula System

I. This policy is based on an amalgamation of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and the World Bank strategy on digital technologies in education.

II. A multilateral approach will be made where stakeholders would work alongside the government to create and maintain the e-education infrastructure ensuring cyclical accountability of all actors.

III. Stakeholders to make contribution in kind to the local educational infrastructure in relation to their work experience and expertise.

IV. Part remuneration to the stakeholders would be made as school fee waivers and provision of electronic devices and internet connections for their children

V. The MGNREGA database shall be used as a foundational database for the volunteer workers on an immediate basis in light of the pandemic. In this amalgamation of the MGNREGA scheme and the Digi-Gurukula system, volunteers would be required to work towards creating stronger infrastructure to bridge the digital divide like electricity and network connections

VI. Setting up of internet and network connection in all parts of the country under the Digital India scheme to facilitate online learning in pandemic and to aid various state schemes aimed towards online education like Kerala Free Laptop Scheme and Medhavi Chhatra Scheme



- VII. Funding for remuneration in both cash and kind (fee waiver, device provision, etc.) to workers under the scheme: Proposals to World Bank, Asian Development Bank etc. would be made since this policy is in line with their schemes; partial direction of capital from PM and CM funds and other educational funds proposed
- VIII. An extension of the Digital Saksharta Abhiyan would empower Anganwadi workers to become responsible for overseeing the process of e-education on the home front.
- IX. Use of the Digital Infrastructure for Knowledge Sharing (DIKSHA) to provide students with a database of high quality resources on literacy. Quality of infrastructure and software on DIKSHA to be improved under this program
- X. Special training for teachers to be organised under the scheme to facilitate the smooth running of e-learning programs and to promote teachers to also contribute to overlooking local volunteer groups.
- XI. Health Supervisors to be appointed to ensure the minimal spread of disease among workers, and sensitising rural populations on inclusion of minorities as required
- XII. Classes to be conducted in two slots- morning and night. The remuneration for night school to be higher than morning school to incentivise people to send their children to night school.
- XIII. In the event that a parent chooses to send their children to night school, the parent will be awarded their perks and salary contingent on a certain percentage of compulsory attendance by their child, with a rare exception to medical conditions.

Feasibility

Technical requirements

Implementation of DISHA Programme so that digital literacy becomes prevalent in rural areas. Health supervisors to ensure minimal spread of disease among workers, educating teachers on using technology, sensitising rural populations on inclusion of minorities required.

Funding requirements

Funding for remuneration in both cash and kind (fee waiver, device provision, etc.) to workers under the scheme: Proposals to World Bank, Asian Development Bank etc. to be made since this policy is in line with their schemes; partial direction of capital from PM and CM funds and other educational funds to be made.

Transferability of policy

The Digi-Gurukula System would be applicable to both, a post-COVID world and to non-rural areas with some additions and substitutions to the scheme.

1. To Post-COVID Times: Since the policy targets both, COVID-born obstacles to a digital education and systemic issues that have long-plagued the education system and society in general, the policy would be easily transferrable to an offline system of education if it completely reverts



back to this stage after the administration of vaccines. This policy would, in that case, continue supporting education and centrally regulating the equitable enrolment of students to schools.

2. To Non-Rural Areas: Economically backward families in non-rural areas are equally in need of these policies. Even though broad infrastructure in terms of network connectivity may exist here, this policy begs implementation to provide access to devices among such families.

Some Negative Externalities

1. Families having 3+ children and only one member enrolled as a volunteer in the scheme shall face hurdles as the remuneration provided shall not be enough to directly cover the educational costs of all children

2. Restricting the policy to families with less than 3 children defeats the purpose of inclusion

3. This plan is contingent on the government's fulfilment of certain other policies

4. The stigma attached to night school might deter parents from sending their children. Apart from this, there might not be enough teachers to handle both the batches in rural areas.

Executive Summary

This policy attempts a multi-pronged approach to involve the stakeholders to work alongside the administrative bodies to create a strong foundation for e-education in India and hence bridge the digital divide that has plagued the education system in the past year. It aims to collate the educational aspirations of the Indian people with the greater purpose of the Constitution in tandem with the ground reality of the nation during the pandemic.



Tackling the Repercussions of Artificial Intelligence in the Business Arena

- Team Creva

Thesis

Legally enforceable standards and measures need to be established to deal with the negative implications rooted in the proliferation of AI in business sector practices that are majorly causing repercussions on society as a whole.

Executive Summary

Artificial Intelligence is an indispensable element for a developing nation like India because of its contribution to the nation's economic and technological growth. In the last 5 years, India has seen its first Robot Sub-Inspector (Kerala), a Robot-Run restaurant (Chennai), and even a telerobotic surgery performed by a cardiologist 32 Km away from the patient (Ahmedabad). Our country is running towards having a huge AI and Data-based technology landscape but has not developed 'AI Laws' for the same. With all of its bells and whistles, AI brings a technical hurdle, that is, its non-existence in the 'legal landscape' of Indian society. Addressing this concern requires a balance between innovation and individual rights. The traditional Contract and Tort Laws cannot strike legal cases or deal with complaints based on AI, as, on this level, the commercial and regulatory complexities pose a different challenge altogether. One cannot blame a machine for committing harm and so keeping check and control on a whole new phenomenon of AI can only be possible via legally enforceable routes. In the years to come intelligent objects will be overtaking the business sector more than ever.

Urgency

Autonomous objects are not a matter of "if" but rather of "when" such technology will take over the manual labour completely and influence the industrial sector in uncountable ways. In the business arena, to accept artificial intelligence and autonomous objects as a safe alternative to human-controlled objects, legally recognized regulations need to be executed and implemented. It is the need of the hour to deal with a new proliferating phenomenon that has harmful repercussions and does not exist on any legal paper. Scope of accountability is absent and one cannot hold a robot liable for any accident. Developers of AI systems should work under governmental guidelines, but unfortunately, the guidelines don't exist. Standards need to be set to regulate the usage of this highly impactful technology to prevent the overstretching of ethical standards by businesses thereby fostering a healthy technological environment for the industry & the public. Since 2016, the Japanese Government has implemented a legal system for AI-based laws and regulations which mainly focus on collaboration, transparency, controllability, safety, security, privacy, ethics (respect human dignity and individual autonomy), user assistance & accountability. This process has allowed Japan to have a technological environment that is working within the bounds of human ethics and establishing greater collaboration between the government, industry, and other concerned domains.



Background

Political

The Right To Vote is a fundamental human right in the Basic Doctrine Structure which is being infringed. Election campaigns of the US (2016) & India (2019) was moulded to reach out to a specific audience by stretching ethics & influencing the citizens. The right to privacy is infringed by misusing technology having negative implications on society.

Personal

Whatsapp rolled out new Terms & Policy (w.e.f. Feb 8, 2021) to which we all agreed to without a glance. The update in the document was that all of the personal data on a person's WhatsApp account including the contacts, transactional, status information, etc will be fed to Facebook's data centres thereby infringing privacy rights.

Psychological

Big Data & AI limit independent choices by automating searching & sorting. AI involvement increases the long-term effect of limiting choices, psychological manipulation & behavioural analysis.

Social

Algorithms replicate & reinforce inappropriate bias due to training on biased datasets, input from biased designers & developers or simply through lack of consideration leading to 'further polarization of the labour market' between highly paid workers & other jobs. Benefits & ease of life created by AI will "only" reach the cream of the society & might not be "inclusive" in nature. Also, the developers of our AI systems are predominantly white & male thereby affecting all of society.

Legal

If criminal proceedings require the accused to confront & cross-examine the witnesses testifying against him, how do we ensure that computer algorithms get the same treatment? The courts will have to deal with juristic challenges such as "who is liable" & "to what extent". The machine's autonomy renders many established legal doctrines obsolete & will affect what we judge to be "reasonable" human activity in the future. Regulation must be such, that carefully balances flexibility for innovation & keeps a check on safety, liability & competition. Legal issues related to AI concern patentability & joint infringement.

Environmental

A University of Massachusetts study found that training an AI model leads to emissions of 300K Kgs of carbon. The most brutal forms of AI are evident in the deployed Legal Autonomous Weapon Systems, colloquially known as "killer robots". The dangerous implications of a weapon that can kill, with explicit human directions are innumerable.

Genesis of the concerns



AI is infiltrating the Business sector at a fast rate whereas it is slowly impacting the public domain. Due to this pace difference, there is a lack of a formal and legal framework to regulate the deployment of AI systems in ways that are beneficial for the industry as well as the public. The impact is not yet visible to the general public and hence it is not a priority for the respective authorities and policymakers to enact the same. The major reason for companies to use citizens as data points and follow up their virtual footprints is because the more data a company has, the more value it holds.

Solution Brief

Recommendation One (Tackling the Pace of AI)

The business using consumer data and in turn giving them recommendations based on the data analysis needs to be in check to not influence the choices of the consumer and not take away their right to have personal choice.

Standards need to be placed on designers and developers of AI systems to prevent them from causing psychological manipulation of the consumers in the long run in the name of “*personalized recommendations*”.

The data access given to the business should be the sole independent right of a person. Standards should be set for letting consumers use the services provided by the business without jeopardizing their personal data. Creva)

Recommendation Two (Documentation and Registration)

To ensure transparency the companies need to register the algorithms and other necessary software details. This should be documented with the testimony of the company authorities. There should be a clear definition of stakeholders to fill in the accountability loophole that exists as of today. This measure will ensure check in cases of non-conformity.

Recommendation Three (Laws and Constitutional Amendment)

A wide ‘framework of regulatory laws’ needs to be established. Government actions should be executed the government needs to start with a legal definition and a legal personality of AI.

A document enlisting the rights and obligations of each party in commercial Artificial Intelligence transactions should be a part of this framework. ‘Absolute Liability’ should have a critical role in the ‘AI Acts’ to keep in check the hazardous activities on a mass scale, specifically. Laws need to be created and added to the already existing Data Protection Bills, to control cropping up privacy issues as companies are feeding more and more consumer and vendor data into advanced AI-fuelled algorithms. In the Indian scenario, the election commissioner should be empowered (constitution law) to ensure that the campaigns do not include influencing the voters through data-driven, AI-based media.

Recommendation Four (Environmental Restrictions)

To keep in check the hazardous outcome affecting the environment and wildlife, new standards need to be established. The National Green Tribunal Act(2010), The Air (Prevention and Control of Pollution) Act (1981), The Water (Prevention and Control of Pollution) Act (1974), The



Environment Protection Act (1986), and The Hazardous Waste Management Regulations are some of the regulations governing the industrial sector as we speak of 21st Century.

Recommendation Five (Ensuring Job Security)

The government should set a standard stating a certain percentage reserved for manual labour, which has high chances of getting automated. The companies bringing the software which cut down jobs and activities need to make sure that the displaced labour is either “*upskilled*” or is giving a job in other “*upcoming sectors*” or is trained to handle the given AI machinery. In the case of India, this measure will ensure that Article 21 of the Indian Constitution is not infringed by protecting the life and dignity of an Indian citizen by providing jobs and a sense of security.

Conclusion

Our concrete solution towards the issues enlisted above majorly involves the policymakers and authorities to empower themselves and take control to check AI fuelled businesses to make sure their functioning is ethical for the public and the industry. The advantage of the given solution is that it is just a start, which once begins, will fire a whole new process of legally documenting AI into our system. This process is also sustainable as it only involves setting up standards and a committee to work on the whole subject of AI. It is also about introducing a new Ministry, if one talks about the Indian Scenario.

This process is also flexible in nature as laws are ever-evolving and will change as times will change. Data privacy laws are imperative, not because machines are dangerous, but because humans are. As of now, AI laws are not on the list of priorities for the UN. Consequently, the regulatory postures of several countries remain trivial. One of the most important bodies attempting to amend the laws and introduce new regulations in regards to AI is the European Union. The law can be further developed in the process of its implementation through consequent amendments using case laws, especially in our common-law nation. It will be a struggle for the legislation of the country to solve the complexity of AI Centric laws, but the path ahead will be prolific for the innovative minds our species is known to produce.

AI will bring fundamental positive changes in our nation, but, as futurist Gray Scott says,

“The real question is, when will we draft an artificial intelligence bill of rights? What will that consist of? And who will get to decide that?”



Data Governance for Ethical Use of Artificial Intelligence to Ensure Sustainable Global Development

- *The Invincibles*

Executive Summary

Artificial Intelligence is one of the transformative as well as disruptive technologies that has the potential and the prowess to impact and transform all the services in today's world just like what electricity did a few centuries ago. Data is fuel to Artificial Intelligence, and India having a large population, a large pool of tech expertise and a huge market stands to lead the AI revolution across the world and becoming the Global Hub of Artificial Intelligence. However, the disruptive nature of AI requires that a responsible and ethical use of AI to ensure that the prowess of AI is utilised and its negative consequences against humankind and democratic set-up are checked in a controlled scenario.

In this regard, the ongoing policy dimensions have been analysed and the improvement areas in terms of National Programme, amendment in Information Technology Act, 2000, AI and Data marketplace, standards, IEC activities, etc are suggested. The implementation aspects, especially riding on ongoing schemes and existing governance mechanism and funding aspects, particularly blended financing are also covered.

Context

- Every individual and each enterprise generate digital data in an unprecedented manner and magnitude. The quantum of data generated in last decade is more than the data generated and stored so far by the entire humanity since beginning. The ever-increasing compute and storage power of devices have now made it possible to store billions of data bytes, analyse the same, and offer services, all of these in few seconds.
- India being second of largest populous countries in the world is uniquely placed to tap data and AI opportunity. India, unlike the western world, has huge data and that goes on increasing owing to demographic dividends. India, unlike ASEAN countries, has heterogeneous data that make data rich and AI solution robust.
- India has huge technical and skilled resources for development of data, analytics, and AI solutions.
- India is a huge market for data driven and AI based products and services.
- AI solutions helping in profiling and resulting in recommendations that are sometimes contrary to democratic norms and against universal judicial norms.
- The Government of India, through Atma Nirbhar Bharat Abhiyan, is supporting Indian and Global MNCs to develop Made-In-India solutions for Indian and global market.
- 28 Countries, including European Union have drafted AI based policies, plan, national startegy in their AI pursuit.
- In India, an overarching policy 'National Strategy for AI' is published by NITI Aayog in June 2018. NITI Aayog has released a working document titled Enforcement Mechanism Responsible #AIforAll for public comments on 18 Sep 2020.



- NASSCOM's report suggest that data and AI can add up-to US\$500 Billion to Indian economy by 2025.

Problem Statement

- Despite unique advantage of India vis-à-vis data and AI capabilities, the global leadership in data and AI is still an illusion and a lot more needs to be done to realize it.
- Indians work behind the data and AI related solutions for Global MNCs but the cost proposition for these solutions for common citizen is on higher side and that limits its access.
- For AI solutions, the biasedness of developers & chosen datasets gets build-in and this compromises the result.
- Big MNCs dictating rules of AI and terms of engagement with a sole motive to earn profit and garner monopoly are another challenge.
- From policy, implementation, and feasibility perspective, the areas that need in-depth valuation.
- Data Governance, AI Governance, Standards and Compliance
 - Implementation differentiation between citizen centric services and industrial services and support mechanism
 - Blended Finance for frontier technology in data solution, analytics, and AI solutions
- **For the group, the focus is on ethics in Data Management and Artificial Intelligence.**

Policy Alternatives and Options

Policy Initiatives (In-progress)

The wide contour of the (Part 2 of the series on Responsible AI) NITI Aayog's document proposes a framework for enforcement of responsible AI principles and it, inter-alia, includes

- Manage and update principles for responsible AI in India
- Research technical, legal, policy, societal issues of AI
- Provide clarity on responsible behaviour through design structures, standards, guidelines, etc
- Enable access to Responsible AI tools and techniques
- Education and Awareness on Responsible AI
- Coordinate with various sectoral AI regulators, identify gaps and harmonize policies across sectors
- Represent India (and other emerging economies) in International AI dialogue on responsible AI

Policy Initiatives (To do)

The above initiative of NITI Aayog is a welcome step. It is at present working document and needs finalisation. The following points may be considered for improvement.



- Compliance mechanism to be identified with clear cut responsibility and accountability from Government, Industry and Academia/researchers
- Data Management and Data Sample used for training and testing purpose need to factor in the biasness and appropriately set the weightage. Herein, the role of civil societies and NGOs will be critical.
- Share of data owner over the market valuation and cash realization of data driven and AI based solution may be an idea, whose time has come.
- Public procurement of AI solutions meeting the set criteria can be given preference at the Government e-Marketplace.
- Data and AI Marketplaces are good ideas proposed by NITI Aayog and NASSCOM, its architecture having benefits for entire society and ecosystem while right to contribute as per the consent and will at citizen level needs to be built in.
- Standards for AI may be worked out and published.

Policy Initiatives (Not to do)

- Any data driven and AI based solution, which works on end-to-end automation and having linkage with human-life directly be avoided.
- Any AI based solution which goes against universal law of Justice and/or cause any kind of discrimination among humans or exploitation of humans, animals or plants be avoided.
- Any AI based solution which can result in offensive weaponisation.

Policy Recommendations

- **AI Programme**
Just like Digital India programme of the Government of India, a National Programme on Artificial Intelligence may be initiated to take the benefits of AI to all domains and across the country. Existing institutional mechanism may be tapped for quick rollout.
- **Change in IT Act**
The responsibility of action and liability of damage needs to be fixed on Government Body, Industry, and developer community and same needs to be reflected in the polices and Act.
- **AI and Data Marketplaces**
The policies of AI and data marketplaces, the rule of engagement of stakeholders, namely, Government, Industry/Start-up, Academia / researchers, and public need to be worked out.
- **Certification and AI and data driven solutions**
The quality, security and ethical aspects of solutions need check and certification for assured ethical AI solution.
- **Information, Education and Awareness**
A mass sensitisation programme needs to be carried out across the country.

Implementation Aspects

- The National AI Programme may be entrusted to the same organisation handling Digital India Programme with a focus to extend the digital initiative to incorporate AI solution,



- wherever possible. The organisation already in place and extension will help rapid development. Extra funding may be required, wherein, blending finance can be explored
- A Review Committee may be set up under the retired Justice of Supreme Court or High Court to suggest the required amendment in IT Act to take into account the responsible use of AI.
 - Data and AI e-Marketplace Platforms need to be implemented, where seed money may be given by the Government and Scaling up can be done with contribution from Industry and Academia / researchers. As a part of the operation, the share of data owner may be in-built as a part of the design.
 - An authorised Government Organisation may empanel agencies to check and certify the quality, security, and ethical aspects of solutions. Each version and/or frequency may require re-certification.
 - For mass sensitisation, Schools, Colleges, Grameen Education and Adult Education Programmes may be roped in.



We were flabbergasted by these impeccable solutions by the participants of the LIT Policython 2021. We are delighted to see that you have gone through the papers and hope that you took away something valuable.

Thank you!
