

PART A
RISE OF MACHINES

- an opportunity or a threat to humanity?

Machines have now become an indispensable part of our lives. They impact every strand of human existence. Their invention has made life easier and comfortable.

However, there has always been an ongoing debate about their desirability, this debate has further gained clamour in the context of 4th Industrial revolution forcing us to introspect if machines present an opportunity or threat to humanity? And if machines ~~are~~ indeed a double-edged sword, then how do we deal with them?

This essay therefore, attempts to understand the evolution of machines, the role played by machines in our present and future - both desirable and undesirable; and our future strategy.

EVOLUTION OF MACHINES

It is an incontestable truth that, the Industrial Revolution in 19th century changed the course of human existence. The development of steam engine, powerlooms not only revolutionised our economic system but also our social and political system. The factory system introduced new forces of production and broke away from the regressive and rigid feudal system. It led to greater production, cheaper products, increased number of jobs and a better standard of living ushering in the era of Modernity and rationality.

However, it was this very emphasis on production and machine that had sown the seeds of colonialism and imperialism that resulted in the economic subjugation of many African and Asian nations for the need of new markets.

In fact, it was this greed for economic supremacy that led to the 2 most ghastly wars (World War 1 and World War 2) being fought in the history of human existence. It was the supremely armed machines, ammunition tanks, guns and the nuclear weapons that increased the intensity of these wars and led to loss of many lives.

Material advancement in the form of machines and technologies, although started as the biggest boon to human kind eventually turned into a bane due to its misuse.

Further, as we move towards a much more 'mechanised world' today, it becomes important for us to critically evaluate its desirability and ask ourselves the most common question -

Are machines going to replace humans?

MACHINES - AN OPPORTUNITY

Machines have impacted both micro and macro aspects of our life. From ^{easing} the manufacturing of this paper and the pen which is writing on this paper to the dishwasher and vacuum cleaner at our home to the calculator we use to simplify our calculations, Machines have now become an all-pervasive phenomenon. They have contributed towards making our lives easier, reducing our workload and giving us ample leisure time to pursue our creative interests.

This indispensability is only going to increase in the near future, as machines take over all the mundane, non-economic activities of our daily life.

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Infact, the impact of machines has been the most profound in the economic sector. India's Green Revolution was based on ~~the~~ mechanisation of Indian agriculture. The lush green ~~agriculture~~ fields and the highly productive

of agricultural sector in the west is a result of the huge tractors and high degree of mechanisation deployed on these fields. Machines, therefore, provide a new dawn to Indian agriculture as it moves from sickle to modern tools of ploughing. Mechanised trawlers have increased fish production and profitability.

The sector that is most synonymous with machines is perhaps the manufacturing sector. Right from Henry Ford's Assembly line production, the factory system has come a long way. It has improved efficiency, reduced operational errors and improved profitability. This has been taken what looked impossible in the past looks possible now. Robots are used to do hazardous and mundane activities. If robots were to be deployed in thermal industries, humans can be saved from pulmonary disorders, if there are deployed in nuclear plants in future, humans can be saved from the harmful effects of radioactive elements.

Machines and Robots therefore provide ample opportunity in the future to reduce risks and increase efficiency.

However, it is not the traditional machines that are of interest to the world today, but machines with intelligent machines that are going to define the trajectory of human progress. What started as a computer has now expanded to the realm of artificial intelligence in the last decade. Today, the buzz word is 'Internet of things', '4th Industrial Revolution' and 'automation'.

Right from self-driven cars to artificial intelligence being used in governance, industries and also medical sciences, there is not a single sphere of life that is going to remain isolated from this revolution. As said by Elon Musk, the founder of Tesla Motors, SpaceX - Artificial intelligence is the reality of the world today

and offers immense opportunities for the progress of human kind.

The government of India has also realised the potential of this revolution through its programmes like Digital India, Smart City which focuses on technology as a crucial anchor of administration.

Besides, world over there is increasing emphasis on automation, in both traditional and upcoming sectors through cutting-edge technology.

MACHINES - A THREAT TO HUMANITY

All the advantages and positives of machines has not stopped the naysayers and critics from highlighting the potential adverse consequences that are bound to arise.

World over, the question 'if machines are going to replace humans' has perplexed policy makers who believe automation is going to lead to loss of jobs and growing inequality. This becomes all the more pertinent for a developing country like India with high levels of unemployment, and increasing pressure on the state to provide formal jobs to

maximise the country's demographic dividend.

~~Further~~ There are increasing concerns of man becoming subservient to machines and the increasing ~~low~~ degree of his dependence on machines.

Phones have now become a necessity for our survival, at the cost of our individual independence. 'Artificial Intelligence' and 'Internet of things' further aims at integrating us to the digital world posing threats of cyber security and lack of privacy.

Further, World over, the question ~~is~~,
"if machines are going to replace man"

has perplexed policy makers who believe automation is going to lead to loss of jobs and increase inequality. This becomes all the more pertinent for a developing country like India, with growing levels of unemployment and a large employable force. ~~Although, the government has introduced schemes like Make-In-India, start up.~~ If we don't use our demographic dividend to the best of their ability, it might turn into a ~~low~~ demographic disaster posing threat to social life.

This growing aggression and alienation is already seen the world over in the form of growing protectionism, anti-globalisation, xenophobic tendencies to protect the socio-economic rights of their citizens.

As the world moves towards a 'mechanised world', the north-south divide the world over is going to increase. Since developed countries have the financial and logistical means to use technology to their best use.

While the developing countries have a stark digital divide, low digital literacy and high poverty levels. Rise of machines therefore poses threats to the stability of world order in the future.

Since most of the machines run on electricity, rise of machines shall also hamper sustainability levels and increase carbon foot print. World's growing power needs and its concomitant responsibility towards climate change must be recognised.

WAY FORWARD

Machines and their rise in the future is a reality we must accept. Therefore, efforts must be made at the local, state, national and international level to reduce the possible negative fallouts.

An important suggestion made in this regard against loss of jobs is the Universal Basic Income. This is an idea being debated across the world and has even been emphasised by the Economic Survey (2016-17).

While rise of machines is a gradual process, the government of India has started making efforts towards providing employment opportunities through Make-in-India, Skill India, Start Up India - and the National Manufacturing Policy aims at expanding the manufacturing sector before the wave of automation takes over the world in its entirety.

Further, at the global level, efforts should be made to ensure parity between the developing and developed countries through technology and

financial transfer.

We are at the cusp of a new form of 4th Industrial revolution, and hence it becomes important for us to use it as an opportunity and reduce the possible threats that it has to humanity.

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EDUCATION PART-B
SYSTEM IN INDIA
a leveller or source of Inequality?

Geeta and Priya are two young 14 year olds who aspire to become doctors. While Geeta belongs to a well to do family, goes to a public school in city and has the means to achieve her dreams; Priya on the other hand is worried if she will be able to continue her education, since the RTE Act, offers only free Primary education and her family of farmers cannot ^{help her} pursue further education.

The above case shows the classic dichotomy that plagues our education system today and forces us to ponder if Education is a leveller or a source of inequality in today's time?

This essay attempts to answer this question by understanding the evolution of education system in India, the status of education

System today as a leveller or a source of inequality; and then suggest measures to resolve this challenge.

EVOLUTION OF EDUCATION SYSTEM

The education system in India has been rooted in its traditional ethos starting from the guru-kula and guru-shishya Parampara. However, it was mainly ritual, esoteric ^{nature} and Brahmanical in ~~character~~ and an entitlement of the Upper Caste and Upper class. Caste and Gender based discrimination made education an exclusive right.

Later, the education system in India underwent a sea change under the British - through Macaulay's minute, Woods dispatch. It now became secular, scientific and rational in form focussing on English as its medium and mass based in character. In spite of these changes it continued to cater to the upper caste and upper class particularly in urban areas.

Hence, at the time of Independence, it was the prime responsibility of the Constitution and policy makers to ensure mass based, equitable and accessible education. Therefore, it changed in form and structure but with it came new challenges and anomalies.

EDUCATION AS A LEVELLER

It has been widely accepted that education is a tool of social mobility and social change.

It provides 'equality of opportunity' irrespective of class, caste, gender and race. In a society laden with all these social fissures, Education thus acts as an important leveller in India.

The National Education Policy, 1968 and 1986 have extensively focussed on providing equal educational opportunities and reducing disparities by setting up open Universities such as IGNOU, schools such as Kendra Vidyalayas and increasing budgetary support to the Education sector. Our literacy rates have therefore increased from 12% in 1947 to 74% in 2011.

Further, ^{there are} affirmative action policies aimed at providing education to the socio-economically disadvantaged communities - SCs and STs. The OBCs were also included on the recommendation of Mandal Commission. This is a very progressive step towards ameliorating their condition and provide them an opportunity to compete in the world.

The biggest step towards universalising Education was the enactment of Right to Education Act, providing free and compulsory ^{primary} education to all till 14 years of age. Hailed as a revolution in the Education sector, it has managed to achieve near universal enrollment levels through its schemes such as Sarva Shiksha Abhiyan, Mid day meal scheme, Kasturba Gandhi Balika Vidyalaya and the most recent Beti Bachao, Beti Padhao.

Every child - whether a girl or a boy; whether rich or poor; whether OC, OBC, SC or ST; whether Hindu, Muslim or Sikh; whether city or non-city based

now has an equal and, accessible and affordable opportunity to avail the benefits of education in this meritocratic world.

The government has also launched Skill India and other vocation-based training schemes to upgrade technical and non-academic skills of individuals.

In the last three years of UPSC CSE toppers; we have had a girl from a small town, a girl belonging to a disadvantaged community and a girl with physical disability top this exam. This itself shows the unparalleled power of empowerment and equality that Education provides.

EDUCATION - AS A SOURCE OF INEQUALITY

However, inspite of considerate efforts made by the state to make education equitable, affordable and accessible; we continue to see glaring inequalities across gender, class, caste, region and also religion.

The biggest manifestation of which is the inconsistent literacy rate across India. Although, the national

average is 74%; there is a ~~low~~ huge disparity between literary rates of men (82%) and women (65%).

This shows that women are continued to be deprived of quality education due to a strong patriarchal mindset prevalent in society resulting in high level of drop outs. Further, ~~women~~ Women continue to have poor representation at the secondary, senior secondary and college level.

Further, women are increasingly associated with certain subjects like 'arts', 'commerce' at the college level, while professional studies like 'engineers', research are considered 'desirable' for men.

This undermines the potential of a women and relegates her to a secondary status in the society.

This division is also seen across states, For example, Kerala has the highest literary rate of 94%. while Bihar is the least with ~ 64%. This is reflected in the poor Human Deve-

development index of ~~the~~ Bihar, low economic growth and high levels of poverty and underdevelopment found there. Infact, not only across states, but this divide can also be seen between urban and rural areas. where urban schools have better infrastructure and qualified teachers. The apathy of education system in rural India gets compounded in maioest infested areas & insurgency ridden areas. This relegates them into a vicious circle of poverty and robs them of an opportunity to live a dignified life.

Inspite of the affirmative policies introduced by the government, we see that SCs, STs and OBCs continue to have low levels of literacy and unequal access to education particularly in rural areas where they are discriminated in schools, often made to sit on the floor and ridiculed by the other students.

This inequality is further compounded with privatisation of education, where once again education has become a class affair instead of a mass affair. This can be seen in the exorbitantly high fees charged by schools, colleges and coaching institutions these days. It makes us wonder if a poor but equally brilliant child doesn't deserve educational facilities in tandem with his cognitive abilities? As highlighted by ASER, there is grave inequality in the quality of education offered.

An often ignored community is the muslim minority community, as highlighted by the Sachar Committee, which reports that Muslims ~~women~~ have the lowest literacy rates (59%) and even worse is the deplorable condition of muslim women with an abysmally low literacy rate of 42.7%. This has gravely impacted their integration and participation in the mainstream society.

Educational disparities exist not only across sectors but also in the structural composition of our education system where English is given preference over our vernacular languages.

WAY FORWARD

The state therefore, has a gargantuan task ahead. As given in the Niti Aayog Vision document and SDG 4, the state must ENSURE INCLUSIVE AND EQUITABLE QUALITY EDUCATION AND PROMOTE LIFELONG LEARNING OPPORTUNITIES FOR ALL. The state must not only aim at providing education to all but also reduce inequalities in the education sector, and improving equality by bringing the following changes to the National Education Policy:

- Increase budgetary support to the Education sector from 3% to 6%.
- Compulsory Teacher Training
- Improve pedagogical tools through technology. Ex: MOOCs.
- Map the most illiterate communities and areas and specifically target them. Ex: Digital Gender Atlas for Advancing girls Education.
- While focussing on universalisation of secondary education in the future, efforts must also be made to improve the quality of primary education.

However, none of this can be actualised without the active participation of citizens. While the government may construct schools, we won't have students studying in these schools. Therefore, it is important to inculcate mass awareness on the impact of education on every individual and the value it can add to our life in particular and our nation in general.

An educated citizen, is therefore an asset to the nation and can positively contribute towards its development.

'An Investment in knowledge,
pays the best interest'

- Benjamin Franklin .

