ISSN: 0474-9030

Our Heritage

Vol-68-Issue-15

January-2020

UGC Care Listed Journal

DATA SCIENCE AND EMERGING JOB OPPORTUNITIES IN INDIA

Ms. Diya Tanmay Devare
Assistant Professor
Department of Economics, Symbiosis College of Arts & Commerce (SCAC), Pune.

Abstract:

Data Science as a domain has emerged to be a multi-disciplinary field that has paved way for innumerous possibilities and wide applications in different sectors of the economy that enables to capture meaningful insights by analysing available data. According to the LinkedIn 2020 Job Report, the specific job profile of AI Specialist has been rated as the top job profile that has witnessed a hiring surge of 74% annually over past 4 years followed by the job profiles of Robotics and Data Scientists. With the advent of analytics, the high potential of quality data has been unveiled. The use of predictive analysis enables businesses to comprehend the probable outcomes of their business decisions in advance thus making it simpler to make apt decisions based on the given data and scenario. Thus, undoubtedly data science as a tool has become an indispensable source of useful information and is on an epoch-making trajectory. The paper makes an attempt to capture the emerging trends and market sentiments as regards to data science as a domain in India based on relevant and available secondary data. Globally, the U.S.A boasts highest number of job offerings in data science in 2019-20 followed by India, United Kingdom, France and Canada according to Glassdoor's (Economic Research) Job Hiring Trends 2019 Report. A comprehensive study carried out by Great Learning, an Ed-tech company by reviewing 100 companies in leading cities of India reveals a 45% uptick in supply gap of over the past year indicating the increased momentum of adopting analytics by businesses in India to keep up with and sustain soaring competition. Approximately, 97,000 job positions in the domain were vacant due to an exigency of specific talent in India in 2019 that signifies an immense potential of the particular domain as an upcoming career option.

Keywords: *Data science, business analytics, job opportunities, emerging trends and India.*

Introduction:

The last few decades have ushered in an era of technological advancements coupled with a gamut of new ideas, innovations, insights and practices that data science as a domain has offered by percipient use of data by incisive minds at work. The Bureau of Labor Statistics, U.S.A, has forecasted 11.5 million jobs to be created by 2026. Glassdoor's (Economic Research) Job Hiring Trends 2019 Report, indicates India to be the next best destination after the U.S.A. that offers jobs in data science. The IBM report that has been recently published suggests the job offerings in data science will increase to 2,720,000 by 2020. It has also been observed that 59% of the demand for data science jobs is accounted by finance, insurance, professional services and IT. Out of the total job openings, approximately 25.57% demand job openings are for specific job profiles of data scientist, data developers and data engineers. Out of the total start-ups incepted from 2014-19 in India, and approximately 18% of the base are deep-tech start-ups. These deep-tech start-ups are companies that make extensive use of Artificial Intelligence (AI), Machine Learning and innumerate analytical techniques to devise innovative business models based on particular datasets and scenarios aiming at distinct objective functions. To be precise, out of the total deep-tech start-ups in India, 27% make use of AI while 23% use IoT and 21% use Big Data and Analytics. These techniques are increasingly being adopted across different sectors of the economy as they enable businesses to achieve objectives of generating revenues, reducing costs, familiarising them with growth opportunities ahead, high performance and efficient outcomes, etc. thus replacing the traditional business techniques. This change marks a significant change in the structure of organisation of businesses where new roles of Data Analysts, Data Scientists, AI and ML Specialists, Big Data and

Digital Transformation Specialists, Robotics Specialists, services and solutions designers, etc. will replace data entry, accounting and bookkeeping clerks. Thus, the greater use and adoption of data science across sectors signals the improved technological skills in the Indian start-ups ecosystem.

Meaning & Scope of Data Science:

Data Science is a multi- disciplinary domain that combines techniques of statistics, mathematics, computer science, data technology, visualization and operations research that enables extracting productive information from structured as well as unstructured data to make practical strategies providing businesses with innumerate business models and predictions using advanced technological tools. The usage of the term data analysis can be traced back to the oeuvre "The Future of Data Analysis" by Prof. John Tukey in 1962 as he introduced the multifarious facets that data could offer employing techniques of mathematical statistics. Data in itself possesses a special characteristic of heterogenous precision. It is of utmost importance to understand the difference between data science, AI, Machine Learning (ML) and Deep Learning (DL). AI can be referred to as a program that senses, reasons, acts and adapts whereas Machine Learning (ML) is a subset of AI that makes use of different algorithms that refines with number different data sets used. Thus, the quality of analysis improves overtime as the number of cases increase thus increasing the efficiency of predictive analysis in similar scenarios. Deep learning is a step ahead of ML and also it's subset that allows the machine itself to come up with recommendations and use the algorithm that best suits the situation unlike ML where parameters and features are to be specified. The requirement of data, time taken to resolve, time taken to provide solutions and the approach in both the techniques largely differs. The ambit of data science covers AI, machine learning, deep learning with combination of statistical tools that enable modelling various business scenarios that can be used as use cases. The use cases in data science form the realistic base that enable applications of similar processes to existing scenarios that lead to the expected outcomes. The use cases can be classified according to the businesses and specific objectives. Decision making is one of the most commonly used use case of data science that provides enterprises make effective business decisions by analysing market trends, predicting risks in advance and minimising costs and losses. Specific sectors use data science to achieve distinct aims for example, the automobile industry use AI for GPS, news agencies or aviation or travel and tourism enterprises make use of weather forecasts that use predictive analysis tool that data science has offered, banking and finance companies make use of predictive analysis for investments as well as different algorithms for fraud detection in the era of digital transformation, etc. Similarly, data science has made it possible to aid product development by diligently examining different set of parameters to provide innovative solutions and insights for growth of businesses by capturing consumer sentiments. Thus, the scope of data science is not limited and can be applied to different domains that include banking and financial services, pharma and healthcare sector, ecommerce, telecom, media and entertainment, automobile, retail and CPG, travel and hospitality, energy and utilities, etc. In India, banking and finance sector alone accounts for around 41% of the job offerings followed by energy and utilities and, pharma and healthcare sector. The following figure attempts to capture interest of data science jobs under the category of jobs and education in India over the period of past 3 years.

Figure 1: Interest over time of Data Science Jobs in India

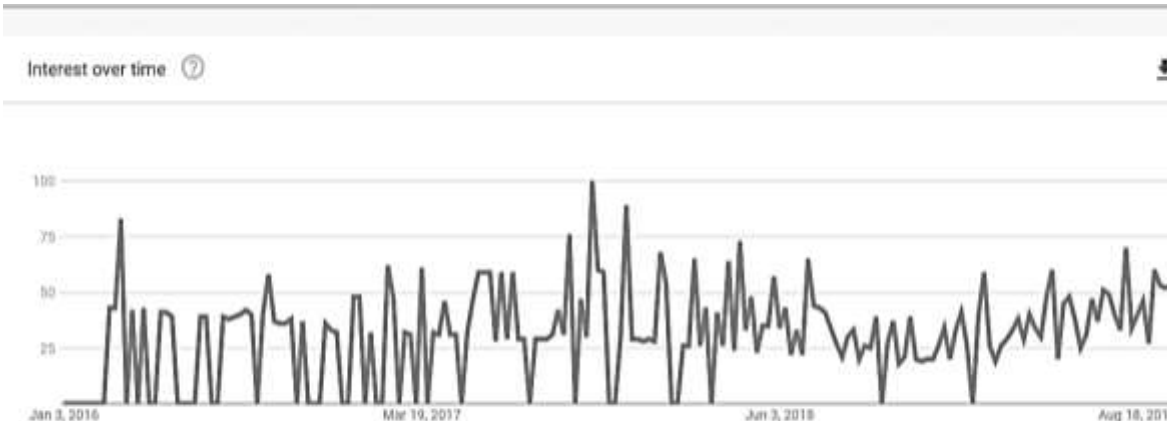
ISSN: 0474-9030

Our Heritage

Vol-68-Issue-15

January-2020

UGC Care Listed Journal

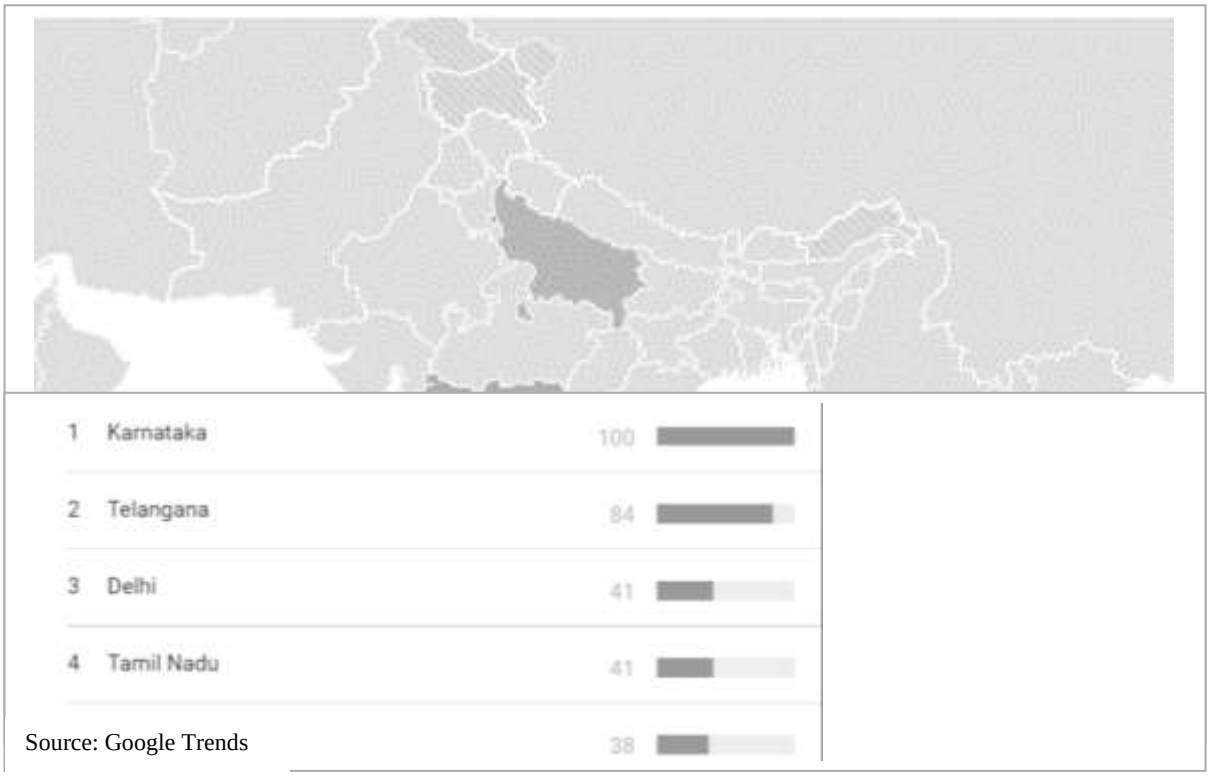


Source: Google Trends

The figure 1 clearly indicates a stable trend in the interest of data science jobs in India over the past 3 years. The interest is over 25% throughout the last year which indicates the growing demand for data science in jobs as well as education sector.

The PLFS report 2018, indicates that services sector is dominant in the states of Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra and Uttar Pradesh that accounts for around 12% of the total services sector in India. The search interest can also be corroborated by displaying the region wise interest in India through the following figure:

Figure 2: Interest over time of Data Science Jobs in across States of India



Source: Google Trends

ISSN: 0474-9030

Our Heritage

Vol-68-Issue-15

January-2020

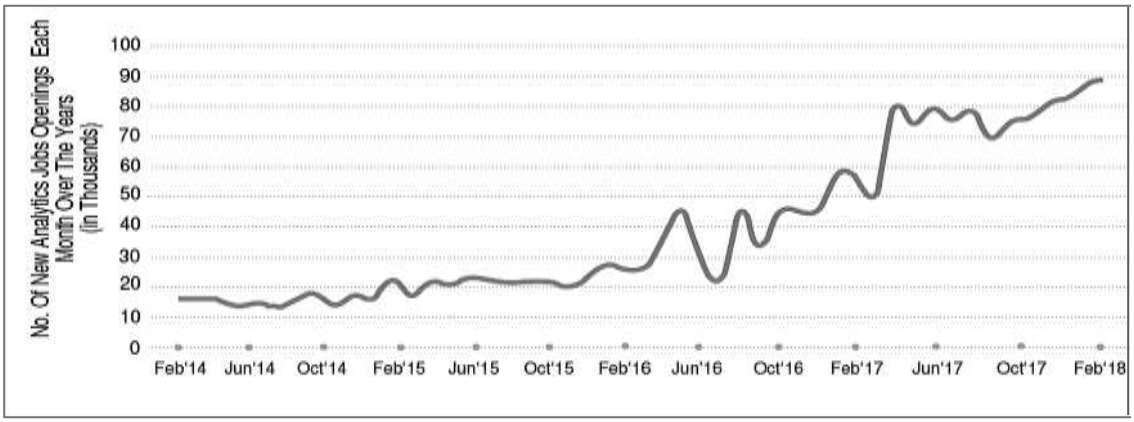
UGC Care Listed Journal

The above figure points out Karnataka to be the state with highest interest in recent years in data science as regards to jobs and education followed by Telangana and Delhi. The state of Uttar Pradesh that records 12% share of the services sector has been shaded to display the NCR region which along with Delhi offer approximately 21% of analytics jobs currently. It is important to mention the link between presence of services sector, higher analytics jobs offerings and trending interest in these specified fields in these particular regions.

Job creation and Data Science: The Future of Jobs Survey 2018, World Economic Forum indicates increase in adoption of new technology, advances in AI, cloud technology, mobile internet, availability of big data, expansion of affluence in developing countries and shifts in national income growth to be the trends that positively affect the businesses up to 2022.

The projected adoption of user and entity big data analytics is around 85% followed by app and web enabled markets (75%), Internet of Things (75%), Machine Learning (73%) and cloud computing (72%). According to NASSCOM'S (National Association of Software and Services Companies) report (Indian-Tech-Start-up-Ecosystem-2019), the start-ups that have been incepted post 2014 have created 40,000 new direct jobs while a three-fold increase in the indirect jobs has been recorded.

Figure 3: No. of New Analytics Job Openings Advertised in India



Source: Edvancer & Analytics India Magazine, 2018

A similar trend of job vacancies amounting to approximately 97,000 was recorded by a leading Ed-tech company, Great Learning based on the primary survey of 100 companies. According to the study there are greater opportunities for candidates having experience ranging between 2-5 years. Also, job opportunities for freshers has recorded an uptick of 3% making it 21% in 2019 as compared to the past year. These statistics clearly indicate the scope of data science as a booming career in India. Also, the Talent Supply Index (TSI) by Belong forecasted more than 400% demand for data science professionals across different sectors of the economy thus indicating a dearth in supply of the same. The number of new job openings advertised in India from 2014-18 (displayed in figure 3) have been witnessing a continuous upward trend. It is observed that since 2016 there is spike in new job openings and has been on an increasing trajectory since then. Specifically, the number of jobs advertised between Apr 2017- Apr 2018 have increased by 76%. The following figure displays the percentage of analytics jobs across cities in India over the past three years.

ISSN: 0474-9030

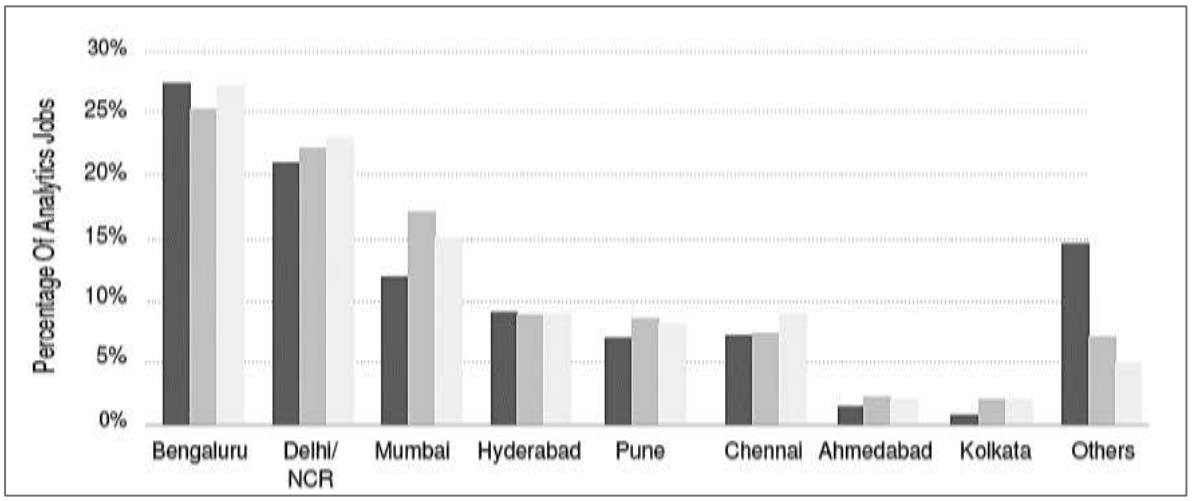
Our Heritage

Vol-68-Issue-15

January-2020

UGC Care Listed Journal

Figure 4: Percentage of Analytics Jobs across Cities in India



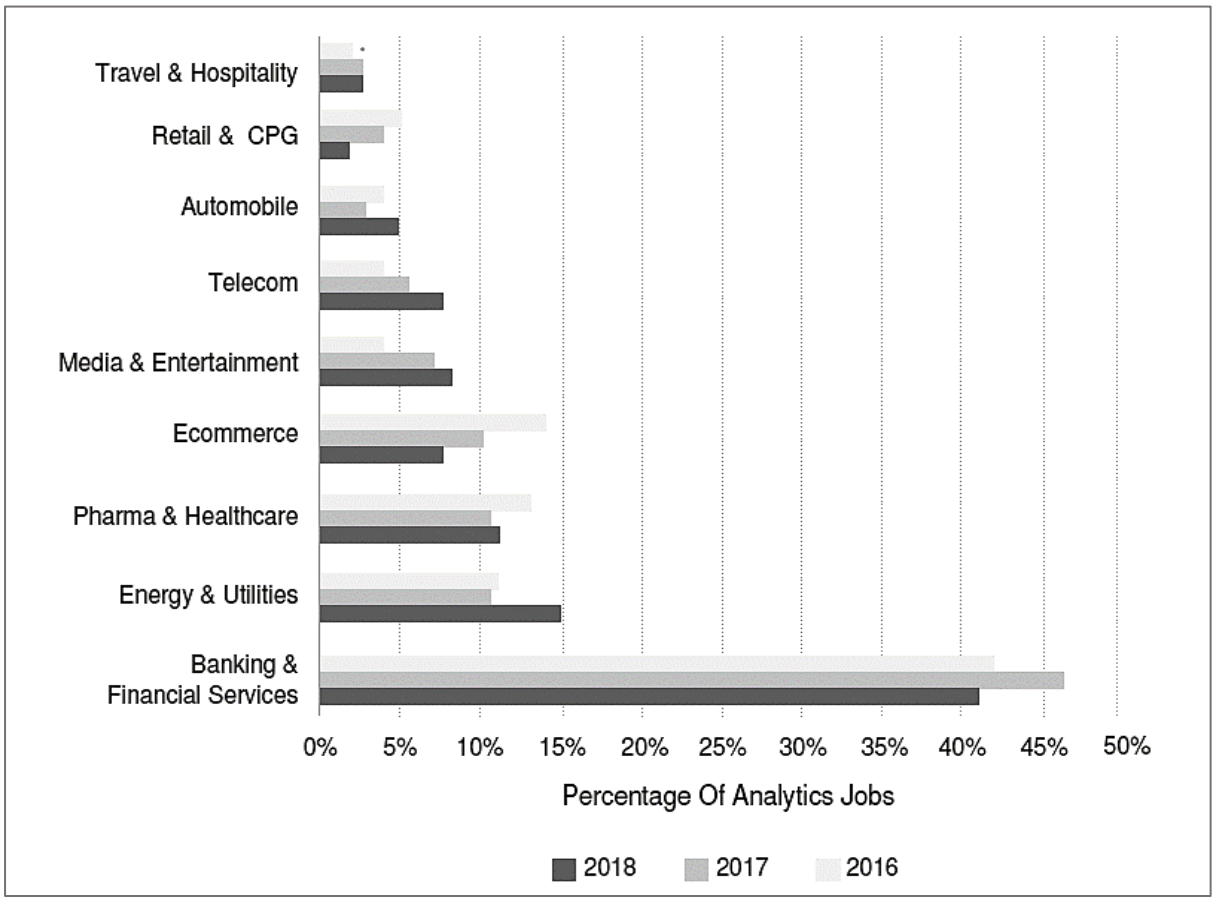
Source: Edvancer& Analytics India Magazine, 2018.

More than 25% of analytics jobs are offered by Bengaluru city (27%) alone and it can be observed that it has increased marginally in the past three years.

The percentage of analytics job offerings Delhi/NCR regions (21%) have decreased marginally (1%) in this time period whereas Hyderabad displays a steady trend. A significant decrease in the analytics job offerings can be observed in the Mumbai region that accounts for 12% of job offerings. Cumulatively, Pune and Mumbai region of the state of Maharashtra have displayed a decrease in the past three years. It is interesting to understand the distribution of demand for the analytics jobs across industries that is displayed in figure 5.

More than 40% of the demand for analytics jobs were from the Banking and Financial services sector and this could be attributed to digital transformation of banking and financial services, stock markets, need for data security, predictive analysis of investments, etc.

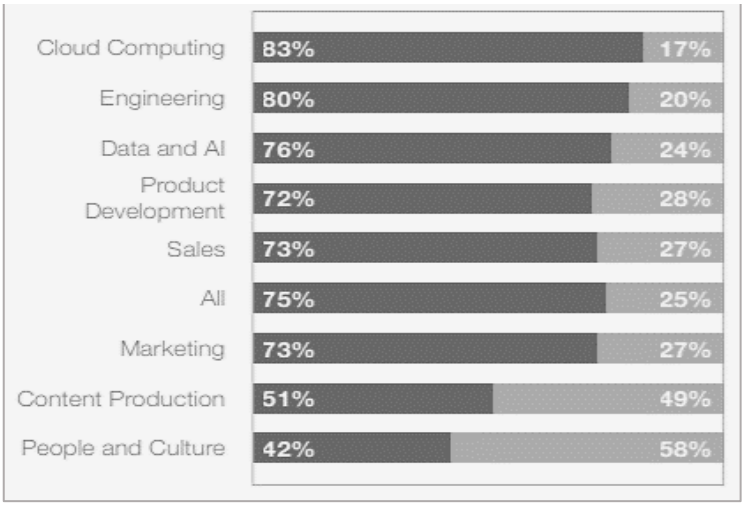
Figure 5: Percentage of Analytics Jobs across Industries in India



Source: Edvancer & Analytics India Magazine, 2018

Women in Data Science: The Global Gap Report 2020, highlights the areas with highest gender gaps, emerging jobs for future economies being one of the main concerns. These emerging jobs profiles comprise of Product Development, Data and AI, Engineering and Cloud Computing. The participation of women in most of these job roles is less than 30% in most of the economies in which Engineering and Cloud Computing record the lowest representation of women that is 12 -15%. The figure below is representative of the Indian scenario where one can observe a similar trend vis-à-vis the global trend.

Figure 6: Share of Men & Women by Professional Clusters in India



Women have focused mainly on the baseline skills over time but AI and cloud computing are the skills that should be targeted for greater participation in the emerging jobs roles. Thus, up-skilling and specific trainings seem to the probable solution to the problem of representation of women in an arena where presence of women is at a nascent stage.

Conclusions:

The overall scenario of presence of data science in different domains and its demand for multifarious requirements suggests that there is an exigency of providing required trainings on specialized skills which would probably tap the available job opportunities. The employees in genetic engineering could be given an option to reskill as they possess base line skills. One of the limitations of the paper is the inability to cover the upcoming Ed tech companies in India that could have been beneficial to provide a much explicit account of the current situation in India. The startling statistics from the various reports based on both primary and secondary surveys highlights data science as an emerging domain providing job offerings in recent times in India.

References:

1. Barbarasa, E. Barett, J. Goldin, N. “Skill Gap or Signalling Gap – Insights from LinkedIn in emerging markets of Brazil, India, Indonesia and South Africa. S4YE and LinkedIn.
2. Edvancer & Analytics India Magazine: “Analytics and Data Science Jobs in India – Study.” (2018).
3. Glassdoor: “Economic Research Job Hiring Trends 2019 Report.” (July, 2019).
4. Markov, W. Braganza, S. Taska, B. Miller, S. Hughes, D. “The Quant Crunch – How the Demand for Data Science Skills is disrupting the Job Market, 2017” (Burning Glass Technologies and IBM).
5. NASSCOM: “Indian-tech Start-up Ecosystem, Report 2019.”
6. NITI Aagyog: “National Strategy for Artificial Intelligence, June 2018.” Discussion Paper.
7. WEF (World Economic Forum) Insight Report “Data Science in the new economy - A new race for Talent in the 4th Industrial Revolution.” (July, 2019).
8. WEF Report “Global Gap Report 2020.” (Dec, 2019).
9. World Economic Forum, “Future of Jobs Report 2016.”
10. World Economic Forum, “Future of Jobs Report 2018.”
11. Tukey, J. “The Future of Data Science (1961).” Princeton University and Bell Telephone Laboratories.