Report on Work from Home Assignment
(Research output based on work from home assigned by faculty)

COVID-19 AND ITS IMPACT ON INDIAN ECONOMY

A Report

By

PRERANA PAYAL

Mentor
Neetu Purohit
Associate Professor

MBA Hospital and Health Management
2019-21

The IIHMR University, Jaipur

1, Prabhu Dayal Marg, Sanganer, Airport
Jaipur 302029, Rajasthan
Ph: 0141 3924700, Fax: 3924738
Website: **www.iihmr.edu.in**

PART 1

COVID-19 AND ITS IMPACT ON INDIAN ECONOMY

ABSTRACT

The outbreak of the covid-19 pandemic is an unprecedented shock to the Indian economy. The economy was already in a parlous state before the pandemic along with the prolonged country-wide lockdown leads to disruption on demand and supply chain of business and face a protracted period of slowdown in economy. The rate at which the virus is multiplying in the current times is a major reason of the lockdown and may be one of the remarkable crises of the economy. This paper describes the potential impact of covid-19 on GDP, Unemployment, Export and import.

KEYWORDS: Covid-19, Economic crisis, Demand and Supply, GDP, Unemployment.

INTRODUCTION

The novel coronavirus (covid-19) has infected more than 5.4 million people in more than 200 countries and the death toll crossing more than 1000000, the World Health Organisation declared, the total number of cases in India has soared to 682143 and fatalities to 18164 till 30 June 2020 . All the policy actions such as social distancing, shutting institutes, public facilities, order to stay at home impact on the economy, day to day lifestyle and well-being both subjective as well as objective. The situation is not good even before this pandemic as global economy facing unexpected rise and fall of the stock market, disturbance in trade flow and decrease in growth rate and even worsened further due to demand supply and liquidity shock which covid-19 imposes. The estimated impact of pandemic on global economy will be 2.2% to 4.8% (us$ 3 trillion) .[1] GDP growth rate is already slowed pre Covid-19 to 4.7% which is now estimated down to 2.5% to 4.5% after 21 days lockdown and expected to lose over 32,000 crore every day .[5] Social distancing and lockdown lead to the decrease in labour participation and production as all the factories and working institutions are in halt, wastage of many essential good due to absence of work force to take goods from factories to consumers. The GDP growth likely to go in negative territory as pandemic creates a gap between supply and demand chain leads to economic disruption.

Ozili, et al. (2020) The paper describes the impact of coronavirus on various factors of economy like travel, hospitality, sports, financial, health, education, oil price war, event and entertainment industry.

Also talked about the transition phase in terms of online education, transportation, health affects economy recession and difficulties b/w saving lives and economy as well. It had also discussed about policies to overcome the impact of virus and opportunities to fix both economic and financial status also it has made all countries to improve their health facilities and highlighted the impact of COVID-19 on the global economy.

S. Mahindra Dev, et al. (2020) has compared the situation before the crisis and after the crisis which explains how Covid-19 impacts the economy. This paper highlighted about Banking Sector, Financial Markets, MSMEs, Informal sector and various policies and their implementations to tackle the situation of pandemic and its impact. It has discussed how the preventive action effects, employment, income, production, consumption, Growth rate of the economy and brought all economic activities in halt. In last, also discussed about the measures taken by the Government to improve the economic situations.

Khosle, et al. (2020) paper titled ―"Breaking down of business and Workers in India: impact of Coronavirus crises" explains the major impact of coronavirus on industrial sector which leads to crisis and effects the businesses, health system and the pharmaceutical industry. The paper emphasizes on the new normal of working from home along with exploring the impact on the trade and commerce (exports-imports mainly) to and from China.

Shlomo Maital., et al. (2020): This study surveyed and summarises recent reports on impact of COVID-19 on global economy. The study asserted that major impact of novel COVID-19 outbreak would be on supply side of the market, but the remedies being considered currently is largely focusing on the demand side. It also concludes that under reasonable ongoing scenarios, a global recession is much likely to occur.

RATIONALE

It is important to focus on providing relief and securing the population especially to poor population from health hazard by this pandemic, also we need to work and think long -term to secure the health status of the economy, the sustainability of business and the livelihood of people, apart from providing strong security nets for the vulnerable, ensuring job continuity and job creation And there is an urgent need to mobilise resources to stimulate the economy. It posed a challenge to the industries and companies because of lower demand and supply which leads to crisis and going out of business.

The Covid-19 crisis plays significant role and learning for country, that how to deal with the present situation, recover and emerges stronger, where to prepare for the next normal and possibilities and manage continuity.

OBJECTIVES

1. To explain aggregate change in the economy such as unemployment, growth rate, gross domestic product due to lockdown.
2. To study the economy in the pre-covid-19 period and assess the potential impact of the Covid-19 on different (Export and import, manufacturing) sectors of economy.
3. To explain the disruption in demand and supply due to lockdown and social distancing.

METHODOLOGY

Literature review, a rigorous and comprehensive search of various studies, reports, journals, articles and papers of identified areas was done (The Economic Times, The Hindu, India Today, ResearchGate).

METHOD OF DATA COLLECTION

External Secondary Data Research- Government documents, market research reports, articles were downloaded and studied.

IDENTIFICATION

Articles screened from database and electronic references (Econ paper, RePEc)

SCREENING

N=130 excluded after abstract reading.

N=20 screened after title and abstract reading and three additional search on the reference of relevant papers was also done.

ELIGIBILITY

Total 23 full text articles assessed for review and draw the conclusion.

RESULT

COVID-19 has resulted in an acute demand shock for the economy in India and may lead to a further temperance of the nation's GDP growth, especially due to the fact that the prolonged lockdown due to the virus and a reluctance of firms in fully operationalising its capacity is causing a major disruption across multiple sectors of our economy.

Therefore, there is sharp fall in the prime levels of economic activity and an increased sense of unpredictability and unreliability leading to a twofold blow to the economy- shutdown of firms and businesses which has led to the global shocks in supply chains and a rapid decline in the consumption expenditure of the people and the firms.

This pandemic impacts negatively on economy specially consumption and informal sector which is essential component in contribution to the GDP, This sector was already affected by two shocks consecutively from 2016 to 2019 , first was Demonetisation in November 2016 followed by the Goods & Services tax in 2017 which did not affect the disruption of demand and supply mechanism for long term but in the case of current situation of the demand-supply is not there, hence revenue are not there and the already struggling sector will be disproportionally affected..[5]Also rise in unemployment rate from March 2019 to March 2020 (6.68% to 8.74%) and especially daily-wage workers (the urban poor and migrant laborers) were get affected & left with no work. Companies saw supply side disruption because of their over- dependence on Chinese products, many companies like Maruti Suzuki, M&M, Hero Moto Crop, BHEL, Amtek Auto announced temporary shutdown, collapse of tourism industry, negative growth rate, lack of labour ,raw material for production, transportation, unavailability of goods, lack of cash flow, reduced consumer activity. Merchandise exports in April 2020 stood at USD 17.12 billion, 58.65% compared to USD 41.40 billion in April 2019. Electronic goods (-62%), Petroleum (-59%), organic & inorganic chemicals (-35%) all these group of imports showed negative growth rate. Oil import in April 2020 stood at USD 4.66 billion compared to USD 11.38 billion in April 2019.[23] FMCG firms such as Hindustan Unilever, ITC and Dabur India also shut manufacturing facilities. Some industries depend on other industries for goods but because government has already instructed employees to stay at home so now it's very difficult to meet the customers demand as supply chain has disrupted because of this pandemic. Market value and share decreasing or changing as clients now probing other options if they are not getting good products or on time which is a risk for supplier to lose the market value.

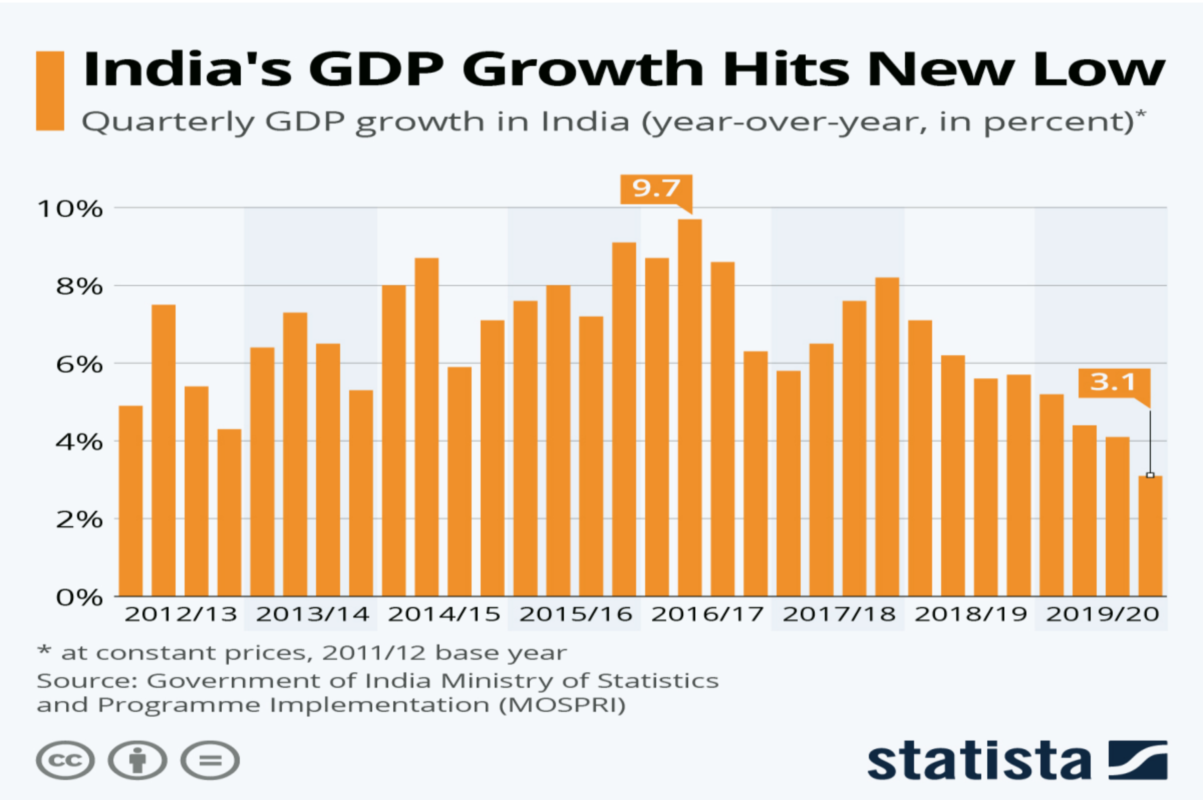
DISCUSSION

As a consequence of the lockdown imposed by the Governments over a period of more than 10 weeks or so, more than half of the economy came to a stand-still due to almost a complete shut-down on the production or distribution of major goods and services within the economy led to the supply side shocks in the economy.

Now, there will quite possibilities of increase in sales, which hardly increases the GDP as these products had already been produced and added.

Then in second phase, demand-side will become more serious. Because, now and after lockdown, large number of people would have been unemployed and not earned any income so the demand and supply condition weaken as all major economic activities were demand conditions weaken sharply as several major economies are in the lockdown mode.

Economists shove off this though, saying that every crisis results in a fall in GDP and revenue growth leading automatically to expansion of the fiscal deficit.



Micro Small and Medium Enterprises (MSME) exporters affects the most by the current lockdown. A study by All India Manufacturer's Organisation says that about 75 million MSMEs in India get affected by this. Out of which 25% goes to shut down if lockdown extended more than four weeks and this percentage reach up to 43% if it extends more than eight weeks.

According to The International Labour Organization four out of five people (81%) in global workforce and more than 25 million people jobs would be affected due to this pandemic and full or partial closure of workplaces.

According to, Centre For Monitoring Indian Economy's (CMIE) the total working population before lockdown was 404 million which is reduced to over one fourth i.e. 285million people out of total 1003 million working age population. Around 19% increase in unemployment rate within one month after lockdown and reached 26% across India. .[11]

Unemployment rate (>=15)%

Months	2016(%)	2017(%)	2018(%)	2019(%)	2020(%) (Till March)
January	8.72	5.93	5.10	6.86	7.16
February	8.46	5.51	5.87	7.20	7.78
March	8.73	4.67	6.00	6.65	8.74
April	8.90	3.87	5.57	7.35	
May	9.65	4.03	5.14	7.03	
June	8.91	4.12	5.75	7.87	
July	8.51	3.37	5.66	7.34	
August	9.59	4.07	6.27	8.19	
September	8.43	4.63	6.47	7.16	
October	6.71	5.00	6.83	8.10	
November	6.51	4.72	6.65	7.23	
December	6.40	4.74	7.02	7.60	

Table:1

Source: Center for Monitoring Indian Economy

The unemployment rate evaluated by CMIE in march is 8.7% and 7.8% in February which is more than 20% after the nation lockdown. Since September 2016 this is the worst joblessness rate in 43 months (Table 1). But on 19th April labour market conditions gets worsened. In the first week of April it was 23.8 per cent; second week it dropped to 23.4 percent; third week it rises to 24 per cent but in the fourth week it gets worsened from 24 percent to 26.2 percent, longer the lockdown period can only worsen the situations (Table 2).

Date	Unemployment Rate (%)
07-04-2019	7.90
09-06-2019	9.00
11-08-2019	8.90
06-10-2019	8.40
08-12-2019	8.30
09-02-2020	8.50
05-04-2020	23.4

Table: 2

Source: Center for Monitoring Indian Economy

Demand side shock: The whole process of demand and production cycle got disturbed because of the huge fall in market ambiguity leads to the double burden for business. Both government and private sectors affected by this in various facilities and services including tourism, Hospitality, Aviation these are the sectors facing maximum loss in the crisis. These sectors include employees around 42.7 million people. Tourism and Aviation contributes 9% and 2.4% of GDP which may impacted at least 2-3 quarters, less demand leads to the decline and shutting down of the marginal firms and industries in auto sector which contributes 10% of GDP and employment to 40 million people.[17] [18] Closing of cinema halls, unemployment, fall in income especially to the daily wage earners leads to the declining in shopping from malls has affected the retail sector as well as changes the consumption pattern of consumer in terms of buying essential, luxury goods and services. The constant fear insecurities and consequences of the pandemic affects mental as well as confidence level of the people that causes behavioural changes in their decision making related to the purchasing. Due to lockdown across the country all of the services related to the travel and transport on a pause or get cancelled in a large scale which accounts a loss of $ 4.5 billion every day and directly impact on slowdown in economic activity of the lockdown. Various business workshops, seminars and conferences got cancelled on such a large scale which is a huge loss.

Supply side impact: Some targeted industries in the supply side go for the shutdown that are the marginal firms. India being the highest exporter of raw material and import source of goods that are required for their intermediate and final goods are on pause now due to the delay in supply of goods from china. Various sectors such as pharmaceuticals, automobiles, electronics and chemical products etc are facing a shortage of required component .[19] As china accounts for 27% of India's automotive part imports. India imports about 85% of active-pharmaceuticals ingredients (API) from china and due to the factor, there is a possibility of shortage in availability and thus prices may go on hike. Due to the lockdown and global pandemic the business is hampering with the production cycle that will further affect the investments .[20] There is about 55% of electronics are imported from china that has slid down to a percentage.

CONCLUSION

Covid -19, only changes our lives for a while but for a long time. Although it is difficult to assess the exact impact of coronavirus on global economy. To calculate the accurate impact, we only not need to take 21-days of lockdown but those extra additional days until, all the services, procedure and production cycles resume. During the decision-making period, India may hit a high of 30.000 Covid-19 infections in India and further double in the week that follows. There would be an eagerness to stretch the lock down and Long-term lock down would deepen our systemic unemployment. Some remedies are worse than the illness and the condition is considered life-protection loss. Life itself is less relevant without livelihoods. Just as the right antidote to sickness is a healthy body, the right antidote to Covid-19 in the medium term is a healthy economy. (Jagannathan, 2020). Also, this is an urgent wake up call for Indian government and companies to work on its own local sourcing units as well as incorporating diagonal strategies for reducing dependency on other countries.

REFERENCE

1-Mukewar P. Trade in the time of Covid-19: The economic impact of coronavirus on India and beyond, March 2020. https://www.indiatoday.in/news-analysis/story/trade-in-the-time-of-covid-19-the-economic-impact-of-coronavirus-on-india-and-beyond-1661118-2020-03-29

2-Singh A. Economy will take time to recover after Covid-19 leaves, March 2020. https://www.deccanherald.com/business/economy-business/economy-will-take-a-long-time-to-recover-even-after-covid-19-leaves-818992.html

3-Hasan A. Impact of Covid-19 on the Indian economy & workforce. People Matter, March 2020. https://www.peoplematters.in/amp-talent-management-impact-of-covid-19-the-indian-economy-workforce-25114

4-Raj V; Bahl G. Coronavirus (COVID-19) and its Spillovers on Indian Economy, June 2020. https://www.researchgate.net/publication/342051894_Coronavirus_COVID-19_and_its_Spillovers_on_Indian_Economy

5-Dev SM; Sengupta R. COVID-19: Impact on the Indian Economy, April 2020. http://www.igidr.ac,in/working-paper-covid-19-impact-indian-economy

6-Ozili, P; Thankom, A. Spillover of COVID-19: impact on the Global Economy, March 2020. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3562570

7-Koshle H; Kaur R.; Basista R. Breakdown Of Business And Workers In India: Impact Of Coronavirus, Department of Physiotherapy, Galgotias University Delhi NCR, 2020. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3557544

8-Mohanty P. CORONAVIRUS LOCKDOWN II: How serious could the impact be on Indian economy and GDP, March 2020. https://www.businesstoday.in/current/economy-politics/coronavirus-lockdown-serious-impact-on-indian-economy-gdp-high-unemployment-covid-19-economic-growth/story/399444.html?utm_source=whatsapp&utm_medium=WEB

9-Kumar A. The Great Lockdown & Its Impact on the Indian Economy, May 2020. http://www.dailypioneer.com/2020/sunday-edition/the-great-lockdown---its-impact-on-the-indian-economy.html

10-GDP growth in 2020-21 likely to be negative: RBI Governor, May 2020. https://economictimes.indiatimes.com/news/economy/indicators/gdp-growth-in-2020-21-likely-to-in-negative-rbi-governor/articleshow/75886009.cms?from=mdr

11- Mehta B; Kumar A. Covid-19 Lockdown Impact: Estimating The job Losses In India's Informal Economy, April 2020. http://swarajyamang.com/amp/story/economy%2Fcovid-19-lockdown-impact-estimating-the-job-losses-in-indias-informal-economy

12-Renjen P. The heart of resilient leadership : Responding to Covid-19, March 2020. https://www2.deloitte.com/us/en/insights/economy/covid-19/heart-of-resilient-leadership-responding-to-covid-19.html

13- Vadim E; Tim L; Stijn Van N. Can the Covid bailouts save the economy, May 2020. http://m.nber.org/paper/w27207.

14-Paul D. COVID - 19: Impact of the Lock down in the Indian Economy, April 2020. https://www.researchgate.net/publication/340930405_Covid_19_Impact_on_Indian_economy

15-Jagannathan R. Modi must not extend lockdown. Economy won't survive on ventilator for long, April 2020. https://theprint.in/opinion/modi-must-not-extend-lockdown-economy-wont-survive-on-ventilator-for-long/397757/

16- Agrawal S.; Jamwal A.; Gupta S. Effect of COVID-19 on the Indian Economy and Supply Chain, May 2020. https://www.researchgate.net/publication/341266520_Effect_of_COVID-19_on_the_Indian_Economy_and_Supply_Chain

17-Leigh G. The Number Of Daily Flights Is Now Dropping Drastically, 2020. https://www.forbes.com/sites/gabrielleigh/2020/03/30/the-number-of-daily-flights-is-now-dropping-drastically-the-latest-in-aviation/#701c2b9943d4

18- Letzing J. How many policy tools are left to soften the impact of COVID-19? March 2020. https://www.weforum.org/agenda/2020/03/covid-19-coronavirus-policy-tools-economic-impact/

19-Cheng J; Qi L ; Wang B ; Zhu G. Coronavirus sends food prices soaring in China, March 2020. https://www.marketwatch.com/story/coronavirus-sends-food-prices-soaring-in-china-2020-03-10

20-Moore M. COVID-19 impact on tourist arrivals by country or region, 2020. https://www.statista.com/statistics/1103147/apac-covid-19-impact-on-tourist-arrivals-by-country/

21-Srivastava P. POTENTIAL IMPACT OF NOVEL COVID-19 ON INDIAN ECONOMY, 2020 doi http://dx.doi.org/10.21474/IJAR01/10979.

22-Maital S; Barzani E. The Global Economic Impact of COVID-19, 2020.

23-"Merchandise exports drop over 60%", 2020. https://www.thehindu.com/business/Industry/merchandise-exports-drop-over-60/article31596022.ece

PART 2

THE DATA SCIENCE COURSE 2020: COMPLETE DATA SCIENCE BOOTCAMP

1.Description

Data scientist is one of the best suited professions to thrive this century. It is digital, programming-oriented, and analytical. Therefore, it comes as no surprise that the demand for data scientists has been surging in the job marketplace. However, supply has been very limited. It is difficult to acquire the skills necessary to be hired as a data scientist. This course includes complete data science training.

Data science is a multidisciplinary field. It encompasses a wide range of topics.

- Understanding of the data science field and the type of analysis carried out
- Mathematics
- Statistics
- Python
- Applying advanced statistical techniques in Python
- Data Visualization
- Machine Learning
- Deep Learning

Each of these topics builds on the previous ones. And you risk getting lost along the way if you don't acquire these skills in the right order. For example, one would struggle in the application of Machine Learning techniques before understanding the underlying Mathematics. Or, it can be overwhelming to study regression analysis in Python before knowing what a regression is

The Skills

a. Intro to Data and Data Science

Big data, business intelligence, business analytics, machine learning and artificial intelligence. We know these buzzwords belong to the field of data science but what do they all mean?

Why learn it? As a candidate data scientist, you must understand the ins and outs of each of these areas and recognise the appropriate approach to solving a problem. This 'Intro to data and data science' will give you a comprehensive look at all these buzzwords and where they fit in the realm of data science.

b. Mathematics

Learning the tools is the first step to doing data science. You must first see the big picture to then examine the parts in detail.

We take a detailed look specifically at calculus and linear algebra as they are the subfields data science relies on.

Why learn it?

Calculus and linear algebra are essential for programming in data science. If you want to understand advanced machine learning algorithms, then you need these skills in your arsenal.

c. Statistics

You need to think like a scientist before you can become a scientist. Statistics trains your mind to frame problems as hypotheses and gives you techniques to test these hypotheses, just like a scientist.

Why learn it?

This course doesn't just give you the tools you need but teaches you how to use them. Statistics trains you to think like a scientist.

d. Python

Python is a relatively new programming language and, unlike R, it is a general-purpose programming language. You can do anything with it! Web applications, computer games and data science are among many of its capabilities. That's why, in a short space of time, it has managed to disrupt many disciplines. Extremely powerful libraries have been developed to enable data manipulation, transformation, and visualisation. Where Python really shines however, is when it deals with machine and deep learning.

Why learn it?

When it comes to developing, implementing, and deploying machine learning models through powerful frameworks such as scikit-learn, TensorFlow, etc, Python is a must have programming language.

e. Tableau

Data scientists don't just need to deal with data and solve data driven problems. They also need to convince company executives of the right decisions to make. These executives may not be well versed in data science, so the data scientist must but be able to present and visualise the data's story in a way they will understand. That's where Tableau comes in – and we will help you become an expert story teller using the leading visualisation software in business intelligence and data science.

Why learn it?

A data scientist relies on business intelligence tools like Tableau to communicate complex results to non-technical decision makers.

f. Advanced Statistics

Regressions, clustering, and factor analysis are all disciplines that were invented before machine learning. However, now these statistical methods are all performed through machine learning to provide predictions with unparalleled accuracy. This section will look at these techniques in detail.

Why learn it?

Data science is all about predictive modelling and you can become an expert in these methods through this 'advance statistics' section.

g. Machine Learning

The final part of the program and what every section has been leading up to is deep learning. Being able to employ machine and deep learning in their work is what often separates a data *scientist* from a data *analyst.* This section covers all common machine learning techniques and deep learning methods with TensorFlow.

Why learn it?

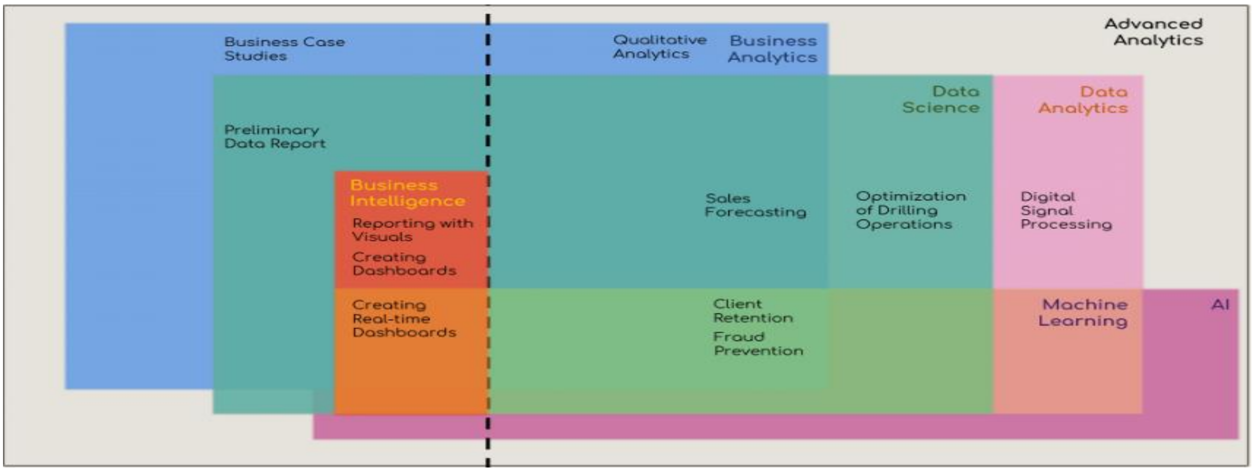
Machine learning is everywhere. Companies like Facebook, Google, and Amazon have been using machines that can learn on their own for years. Now is the time for *you* to control the machines.

2.Objective

This course comprises many objectives related to data science and its application in relevant field. It includes:-

- ✓ To analyze data driven decisions require well organized and relevant data stored in a digital format.
- ✓ To use data how to create reports and dashboards to gain business insights.
- ✓ To assess potential future scenarios by using advanced statistical methods.
- ✓ To understand various business driven processes like basic customer data financial, trading data, price Optimization, inventory management, User experience, sales forecasting, fraud detection and client retention
- ✓ To utilize artificial intelligence to predict behavior in unprecedented ways.
- ✓ To learn data preprocessing and data analysis various statistical tools like regression and clustering analysis.

✓ To understand basic of python, machine learning, artificial intelligence and statistical methods.



1. Course Contents

This course was divided into x sections namely –

a. The field of data science - Introducing various data science disciplines, career in data science

b. Probability - Bayesian interface, permutation combination, probability distributions and probability in Healthcare

c. Statistics - Descriptive statistics practical examples, inferential statistics and hypothesis testing

d. Python - Basic syntax, functions, iterations, advanced statistics method in Python, linear equation, multiple regression, Logistic regression and clustering analysis.

e. Deep learning - Neural networking, tensorflow, overfitting & underfitting and MNIST data set.

f. Business case analysis

g. Case study

h. Analyzing the Predicted Outputs in Tableau

2. Learning Methodology

This course includes 29 hours on-demand video lectures with 90 articles and 154 downloadable resources. Along with that multiple real-life business cases (Case Study) that gives a better understanding. Moreover an unsolved assignment had to be submitted in favor of completing the course.

3. Key Learning from Course

- The course provides the entire toolbox you need to become a data scientist.
- Filling up your resume with in demand data science skills: Statistical analysis, Python programming with NumPy, pandas, matplotlib, and Seaborn, Advanced statistical analysis, Tableau, Machine Learning with stats models and scikit-learn, Deep learning with TensorFlow
- Impressing interviewers by showing an understanding of the data science field
- Learn how to pre-process data
- Understand the mathematics behind Machine Learning
- Start coding in Python and learn how to use it for statistical analysis
- Perform linear and logistic regressions in Python
- Carry out cluster and factor analysis
- Be able to create Machine Learning algorithms in Python, using NumPy, statsmodels and scikit-learn
- Appling your skills to real-life business cases
- Use state-of-the-art Deep Learning frameworks such as Google's TensorFlowDevelop a business intuition while coding and solving tasks with big data
- Unfold the power of deep neural networks
- Improve Machine Learning algorithms by studying underfitting, overfitting, training, validation, n-fold cross validation, testing, and how hyperparameters could improve performance
- Warm up your fingers as you will be eager to apply everything you have learned here to more and more real-life situations