Vijay Nicole

SPARKLES

VOLUME I

Socio-Pedagogy & Techno Methodology

सत्यम् परम् धीमहि

Shrimathi Devkunvar Nanalal Bhatt
Vaishnav College for Women (Autonomous)

Affiliated to University of Madras
Re-Accredited with 'A+' Grade by NAAC
Chromepet, Chennai - 600 044

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Foreword

Research is creating new knowldege

*- **Neil Armstrong***

Today, as the world has undergone a sea change in all fields, including educational development, it is time to recognize the importance of research and to guide both teachers and students about the fundamental component of various studies laced with societal importance. The educational changes necessitated by computing and communication technologies are profound and this book comprises relevant articles and research papers that are written by students with the support of teachers. In this issue of SPARKLES – Socio Pedagogy and Techno Methodology the readers can get information about myriad perspectives on online teaching & learning, smart phones, covidnomics etc. The first giant step of the transdiscplinary approach through this issue will reach miles to traverse the path of Research and Development.

I wish good luck!

R. Geetha

Principal

Shrimathi Devkunvar Nanalal Bhatt
Vasihnav College for Women, Chromepet.

From the Editorial Board

Shrimathi Devkunvar Nanalal Bhatt Vaishnav College for Women is the first Women's college in Kanchipuram district, Tamil Nadu. The College has carved a niche in women's education by upgrading its status as a Research Institute in 2012 with 6 Departments viz. History and Tourism, Statistics, Physics, Plant Biology and Plant Biotechnology, Computer Science, Commerce and English in 2020, offering Ph.D. programme. Six Research Departments offer Full-time and Part-time Ph.D. Programme and 3 departments offer Part-time Ph.D. programme. At present, there are 10 Under Graduate courses in the aided structure and 15 Under Graduate courses, 14 Post Graduate courses, 5 M.Phil. Courses in the self-supporting structure and there are 52 research scholars. The College caters to the needs of 6000+ students with high standard of education and discipline through committed staff that makes women students wiser and stronger. Our college has always been ahead in promoting research initiatives.

To promote a healthy research and writing culture, the college takes pride in publishing two International Half-yearly Journals – International Journal of Multidisciplinary Research in Arts, Science and Commerce (IJMRASC) and Svādhyāya - International Journal of Trans-disciplinary Research and Development (SIJTRD). SIJTRD promotes the concept of trans-disciplinary research by collaborating with natural sciences. IJMRASC encourages Innovative Research, Review of the existing research, Comparative research of different approaches and its interpretation, problem solving research, community based and social relevant research.

To encourage the art of writing research articles amongst UG, PG students and faculty members of our college, we have taken an initiative to publish a multidisciplinary research book SPARKLES – Socio Pedagogy and Techno Methodology which comprises conceptual articles, technology based research ideas, research findings, and investigative ideas. This is an opportunity for the students to build their technical writing skills and formulate research spirit. The New Education Policy promotes research initiatives among students at the early stage so as to inculcate the quintessence of research skills among our students we encourage them to explore and expose to various societal concepts.

The multidisciplinary research book received more than 50 articles from faculty and students across all disciplines. Every paper is different in its own way. Incidentally, Post Graduate Students focused their papers more on research and reviews. Under Graduate students have analyzed a plethora of socio-relevant concepts. Students of Computer Science and B.Com Honours highlighted the impact of online education in their paper "Online Education during COVID 2019'. Students of Economics discussed in their paper the condition of Indian economy and the Financial Scam of India during COVID. In their paper, faculty and students of Clinical Nutrition and Dietetics, presented the different perspectives about health and nutrition. Students of Commerce have clearly stated the ideas behind e-shopping behavior of women and youth entrepreneurship. Students of Physics have presented the analysis of the sunspots on earthquakes and about space-space elevator. Students of Statistics have presented the effective statistical analysis on a few e-commerce products.

Students of Computer science have turned their project based experience on IOT model, at the TECH EXPO, into a research paper to get more insights of the latest technology.

We appreciate the efforts of the young researchers who have made their maiden attempt in writing articles for SPARKLES. Students' efforts in understanding the workable research areas and their ability to observe and write investigative or exploratory articles show their research inclination and involvement to provide a viable solution. Their studies reflect a positive direction in the growing trend of research. We are confident that this issue would stimulate the future contributors.

College e-magazine

Board Members

Contents

A STUDY ON CHANGES IN THE STUDENTS' PERSPECTIVE TOWARDS EDUCATION DURING COVID19

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ABSTRACT

This study investigates the changes in students' perspective towards education during COVID 19 period. The study has considered three aspects of a student's perspective towards 'education and career', 'online classes as a tool to grow' and 'additional time to explore skills provided by the pandemic'. The data is either nominal or ordinal in nature. Statistical tools like the test for association between the attributes, Kruskal Wallis test for simultaneous analysis of various factors, Multivariate Analysis of Variance [MANOVA] for testing several dependent variables with one independent variable were carried out for analysis. The study helped us to gain insights in the student's experience during this pandemic which moulded their thoughts and actions to make a better future.

Keywords: *COVID 19, Association of attributes, Kruskal Wallis, MANOVA.*

INTRODUCTION

COVID 19 is a disease caused by Coronavirus. It is effortlessly transmitted amid humans. Since the outbreak of COVID 19 on December 2019 in Wuhan [China] it has spread worldwide disrupting the lives of people. The first case of the virus in India was on 27th January 2020 and on 24th March 2020, the Government of India declared a nationwide lockdown as a mitigation measure to reduce the quick spread of the virus. The closure of schools in order to reduce the spread of viruses had interrupted the learning of students. As a tool to 'Flatten the curve' the government then decided to conduct classes virtually. This radical shift to virtual classrooms and a pause in the busy lives of students have significantly changed the students' perspective of education.

Some of the papers which discussed about the impact of COVID 19 were referred. **(Henrichsand Short, 2020)** discussed about the Wisconsin's in person election despite COVID 19. It studied the relationship between the usage of polling place and COVID 19 case numbers across the Wisconsin state. **(Morgenstern, Choo, Wang, and Wang, 2020)** discussed the impact of US government's order 'stay-at-home' on motor vehicle collisions in New York City. These papers did not have education as a main study. Further **(Sarah Farooqui, 2020)** article on Education during COVID 19 accelerated our interest towards education. Some of the papers like **(Kronenfeld, Ryon, Kronenfeld, Hui, Rodgers, Thorson and Sands, 2020)** concentrated mainly on Medical student education and discussed whether online learning is a suitable alternative for them. **(Resnick, Mui, Brownie, Kanchanaraksa, Goluband Sharfstein, 2020)** discussed the immediate and long term educational changes undertaken in response to COVID19 specifically in public health education. **(Kummitha, Kolloju, chittor, Madepalli, 2021)** gave us the insight of effects on higher education institutions in India and Ethopia due to introduction of online teaching during COVID 19). These acted as a motivation to have education as a central theme of the study.

Data and Variable Description

This study deals with the primary data collected as a part of a data analysis project in October 2020. The data was gathered in the form of Google form responses. Students were the intended audience. Demographic details like Age, Gender and the academic qualification was collected in order to understand the background of the respondents. On the whole 194 responses were gathered.

The variables under study were either in nominal or ordinal form. The study is perceived under 3 different aspects.

- Higher education and career encloses analysis on the mindset of students regarding higher education and career which were carried out using the variables : 'student's change in study plans', 'opting Indian university', 'courses unrelated to current study', 'rethinking about career', 'gender', 'taking risk in career'.
- Online classes examines the pros using variables such as 'digital lectures', 'additional lectures', 'transportation cost', 'travelling time', 'recorded lecture' and examines cons by mostly targeting on the variables related to 'health and psychological issues' as well as 'challenges of online classes' .
- Exploring talents discovers efficient usage of the pandemic period using the variables 'exploring hidden talents', 'improving skills', 'pursuing talents discovered'.

Methodology

The objective of our study is based on the experiences of the students. Thus the parameters under study are qualitative in nature. This study is more interpretative in nature and the nature of responses is less controllable. Since the study deals with the opinions the questionnaire consisted of questions with 5 point likert scale. Social media platforms provided the required support to spread knowledge about our questionnaire among students.

The collected data was preprocessed to check for any missing observation. Graphs were used for data visualization. The Kolmogorov Smirnov test was used for checking the normality assumption. Association between the attributes and the test for median scores of samples were analyzed using chi-square test and Kruskal Wallis test respectively. The data also had multiple correlated dependent variables with one independent variable. This was evaluated using Multivariate Analysis Of Variance [MANOVA]. To retain the independence of respondents among variables the random number generation has been carried out.

R software with the 3.6.1 version has been used for analysis.

Analysis

Education and career are the passports for a student's better life. So studying the change in the student's mindset towards education and career is vital. (**Murali Sankar's, 2016)** article gave rise to the investigation of the craze for foreign universities during COVID 19. Test for association (Table 1) between the attributes of a 'student's change in study plans' and 'opting Indian university' gave a conclusion that there is no association.

Table 1: Test for Association

ATTRIBUTES	TEST STATISTIC	DEGREES OF FREEDOM	P VALUE
Study plan and choice of University	2.1145	4	0.7147
Career restructuring and pursuing unrelated courses	61.27651	16	3.19E-07

So, the change in study plans won't influence the choice of university (Indian or Foreign). Additionally, an analysis on the association (Table1) between a student pursuing 'unrelated course' and 'career restructuring' resulted in an association between the attributes. Thus we can conclude that during this pandemic students aimed to have knowledge in various domains and restructured their career objectives accordingly. Also, the proportion of men and women who thought to restructure their career is the same which is supported by the Test for proportions (Table 2).

Table 2: Test for Proportions

TEST STATISTIC	DEGREES OF FREEDOM	P VALUE
3.7377	1	0.0532

The pandemic opened up the entrepreneurship interest among students which can be seen in Figure 1**.**

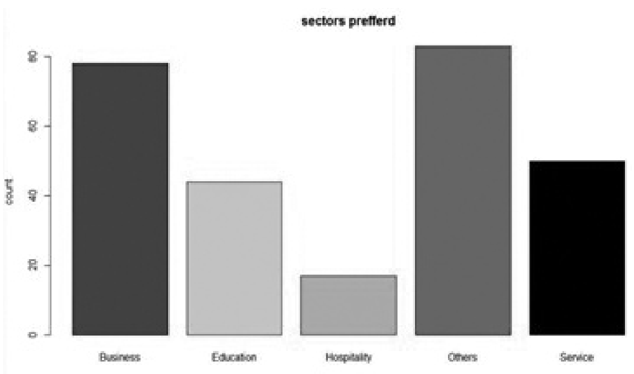

Figure 1: Sectors Preffered by Students

The study of the objective would be incomplete without studying the impact of online classes. To study the impact of online classes the following tests were conducted. The online classes came with a certain set of pros and cons. Kruskal Wallis test (Table 3) acted as a tool to analyze whether the benefits of online classes, represented by the variables 'easy accessibility', 'more learning time', 'record and relearn ideas' , 'no transportation cost'

Table 3: Kruskal Wallis Rank Sum Test

TEST STATISTIC	DEGREES OF FREEDOM	P VALUE
14.032	4	0.007194

and ‘time conservation’ is enjoyed by all the students. The output showed that the extent of the benefits mentioned is different for each and every student. In spite of the above rewards in online education still **149 respondents preferred ‘on campus education than online classes’(**Figure 2).

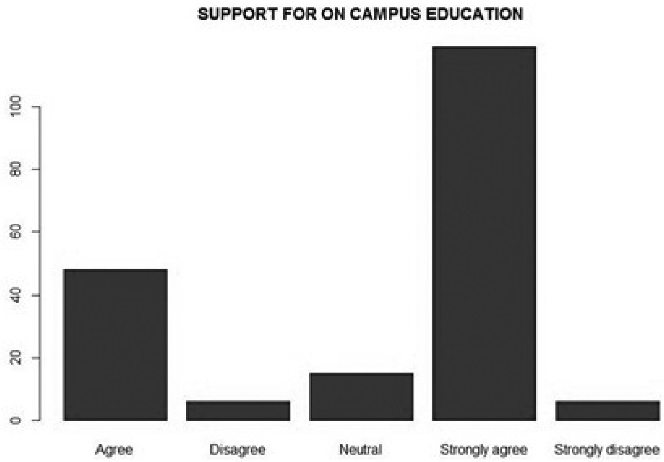

Figure 2: Support for on Campus Education

The key area affected due to online classes is health and psychological well-being of a student. So, analysis was carried out to check the extent of impact of ‘Number of hours of online classes’ on the ‘stress levels’, ‘eye and ear problem’, ‘Edu-life balance’ of the students. There was a correlation among various dependent variables. Upon carrying out a Multivariate analysis (Table 4) with health & psychological issues as dependent variable and online class hours as independent variable it can be concluded that the increase in the number of hours of online classes have a major effect on the stress levels than in any other problems.

Table 4: MANOVA Test

RESPONSE VARIABLE	DEGREES OF FREEDOM	F RATIO	P VALUE
STRESS	1	8.7559	0.003474
EYE PROBLEM	1	2.3197	0.1294
EDU LIFE PROBLEM	1	1.1779	0.2791
EAR PROBLEM	1	2.0772	0.1511

Other challenges in e-learning can be visualized using the likert scale graph (Figure 3). [1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = strongly agree, Neutral is ignored].

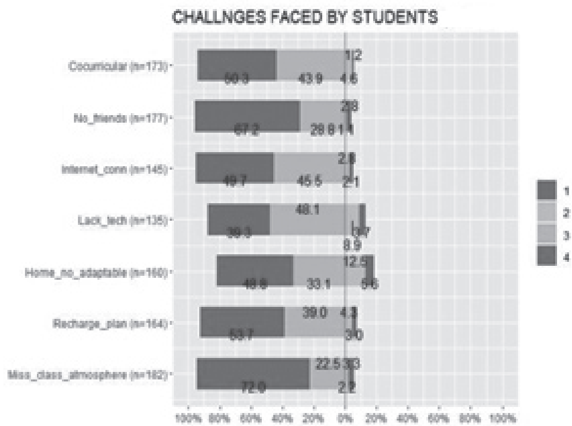

Figure 3: Challenges Faced by Students

As per the data, the major cons of e-learning are ‘Internet connectivity’, ‘missing classroom atmosphere’ and ‘lack of interaction with friends’. Surprisingly, ‘lack of proper access to technology’ is taking the least position in the challenges faced. Although students had to experience the pros and cons of online classes they had a moment of introspection. Test for association (Table 5) between the attributes ‘online class hours’ and ‘enough time for introspection’ concluded that there was no association between the attributes.

Table 5: Pearson’s CHI Square Test

TEST STATISTIC	DEGREES OF FREEDOM	P VALUE
9.3069	8	0.3171

This conveys that the increase in online class hours won’t affect the time for introspection

From (Figure 4), it can be seen that more than 50% of the respondents agreed that they would continue their discovered talents even after the pandemic period.

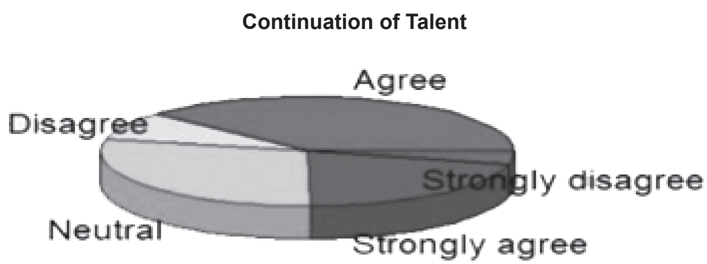

Figure 4: Continuation of Talent

Results

The study can be summarized as follows. Analyzing the test for association between students doing courses unrelated to their study and restructuring of their career and test for proportion concludes that male and females who are doing courses unrelated to their current study are planning to restructure their career as it provides wider knowledge of their area of interest. Interest towards self-employment has tremendously increased which can be inferred using the bar diagram in Figure 1. Introduction of online classes as an alternative to live classes has various advantages. The preference of advantages depends on the student's situation which is supported by the results of Kruskal Wallis Rank Sum test. From figure 2, nearly 75% of the respondents are supporting on campus education. This is due to the increased stress levels caused by an increase in the number of hours of online classes which is inferred from MANOVA (Table 4). Test for association shows that online hours are irrelevant to time of introspection. Students are also willing to continue their talents (Figure 4).

CONCLUSION

Education which once focused on the depth of a subject now started focusing on the width as well as the depth of the subject. This was achieved by the students by doing courses unrelated to their current study which enabled them to restructure their career. As per the data, this change in students' perspective towards education is common for male and female and no sufficient proof was collected to justify the craze for foreign universities. This transition in students' perspective was possible due to the introduction of online classes. Online classes provided advantages like easy accessibility, time saving, reduction in transportation cost etc., which gave students sufficient time to focus on building a wider spectrum of knowledge. During this transition phase the students faced many challenges pertaining to their health, psychological as well as other issues like lack of proper access to technology etc. In spite of facing these challenges, this pandemic provided students the much needed pause in their hustle-bustle life and gave them a moment for introspection to explore their skills and talents. The students are confident that the skills explored during this pandemic would continue irrespective of the situation. On the whole, COVID 19 created changes in students' perspective towards education, career and recognition of their hidden talent which helped them to get moulded into a better person.

ACKNOWLEDGEMENTS

We would like to express our gratitude to Dr. (Mrs) D.Annapoorni, Associate Professor, Department of Statistics for her guidance and constant supervision.

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REFERENCES

1. Henrichs, T. and Short, G. (2020). Pandemic Politics: Physical Polling Place Usage and COVID-19 Cases in Wisconsin.
2. Morgenstern, G., Choo, J., Wang, C. and Wang, Z.(2020). Socioeconomic Disparities in Response to COVID-19 Lockdown Orders: Analyzing New York City Motor Vehicle Collisions.
3. Sarah Farooqui. (2020). Education in the time of Covid-19: How institutions and students are coping. Business Standard, [online].
4. Kronenfeld, J., Ryon, E., Kronenfled, D., Hui, V., Rodgers, S., Thorson, C and Sands, L. (2020).Medical Student Education during COVID-19: Electronic Education Does Not Decrease Examination Scores. The American Surgeon, [online].
5. Resnick, B., Mui, P., Brownie, J., Kanchanaraksa, S., Golub, E. and Sharfstein, J. (2020). The COVID-19 Pandemic: An Opportunity to Transform Higher Education in Public Health. Journal of Public Health Reports, [online].
6. Kummitha, H., Kolloju, N., Chittoor, P. and Madepalli, v. (2020). Coronavirus Disease 2019 and Its Effect on Teaching and Learning Process in the Higher Educational Institutions. Higher Education for the Future, [online].
7. MuraliSankar, K.N. (2016). Foreign education craze on the rise. THE HINDU, [online].
8. McCombes, S. (2019). How to write a methodology. [online] Scribbr,
9. Daniel, W. and Cross, C. (2013).Biostatistics: a foundation for analysis in the health sciences. 10th Ed. New Jersey: John Wiley & Sons Inc.
10. Casella, G. and Berger, R.L. (2002). Statistical inference. 2nd ed. Duxbury Press.

WEBSITES

1. https://www.causeweb.org/usproc/sites/default/files/usclap/2020-1/Pandemic%20Politics%20Physical%20Polling%20Place%20Usage%20and%20COVID-19%20Cases%20in%20Wisco nsin.pdf.
2. https://www.causeweb.org/usproc/sites/default/files/usclap/2020-1/Socioeconomic%20Dispar ities%20in%20Response%20to%20COVID-19%20Lockdown%20Orders.pdf.
3. https://www.business-standard.com/article/education/education-in-the-time-of-covid-19-how-institutions-and-students-are-coping-120043001575_1.html
4. https://doi.org/10.1177/0003134820983194
5. https://doi.org/10.1177/0033354920966024
6. https://doi.org/10.1177/2347631120983650
7. https://www.thehindu.com/news/national/andhra-pradesh/Foreign-education-craze-on-the-rise/article14507550.ece
8. https://www.scribbr.co.uk/thesis-dissertation/methodology/

INDIA'S CURRENT ACCOUNT TREND CONCERNING COVIDNOMICS

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ABSTRACT

The lately emerged Coronavirus pandemic has stupefied the whole world, with its occurrence and impact. The epidemic originated from China, circled the globe, with its dreadful impact over human life, world economy and the environment. The Novel pandemic has forged a transition in Economic, Demographic and Epidemiologic terrain from health's point of view. The crisis has left behind a kinked remark in the economic development of a nation, in terms of its GDP. In India, it has surged a financial loss and has led a domino effect on health and healthcare sector. Despite of economic contractions and financial losses, many nations have begun the vaccination programs and drives, in accordance with World Health Organization's guidelines. This paper aims at showcasing, the Current Account trend and its onto change on Balance of Payment concerning COVID-19 situation. This paper is based on secondary data sources.

INTRODUCTION

As the world was progressing towards the Growth path, around 218 countries were adversely affected by the Novel Coronavirus Pandemic during the start of 2020. The epidemic, shook the entire world with its adverse and disruptive affect on the economies and human lives. Almost 90M people across the world have been high-flown to the epidemic, of which 10.4M were from India. In order to control the situation, the Indian government announced a strict lockdown for around 3 months in a phased manner. The state of the country in context to the lasting epidemic, led to the Economic slowdown, trade disruptions, widespread unemployment, and price hikes. During the pandemic, the nation came up with a concept of "Jaan Hai Toh Jahaan Hai", which displays the nations duty and concern towards its people. The nation's actions determine, that how it could minimize the impact of this epidemic. This economic contraction of the FY2020 could be compared with the great depression of 1930's, and is the profound, since 1930s. The unemployment level has almost reached closer to the latter. In overall, the crisis has reached an element of uncertainty with respect to duration and economic impact.

An Overview of Covidnomics

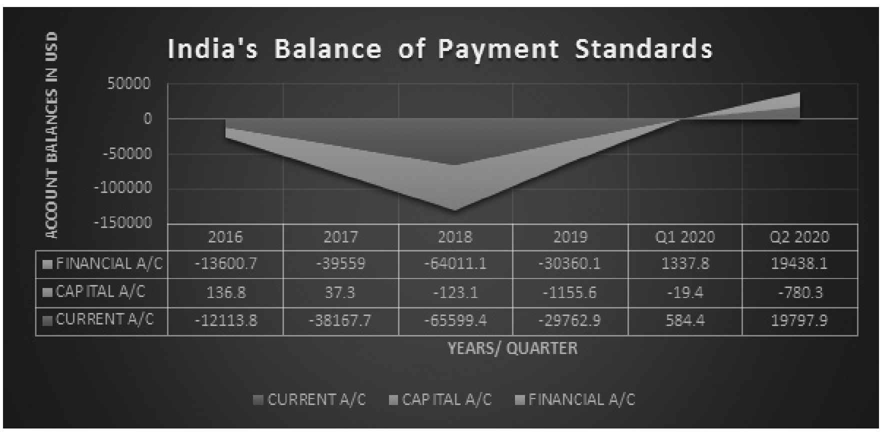
The sudden rise of Covid-19 pandemic has created an unrivalled flabbergast in the world economy. As mentioned by Ravi Sehgal, Chairman, EEPC India, "Insaan, Gyaan, & Vigyan, (humanity, knowledge, and Science), stands challenged; posing socio economic and political risks for the whole world." Economic slowdown, inadequate levels of production, job instability and losses are some of the rotten hand of the Novel pandemic. The pandemic has dynamized the expenditure curve to basic amenities, health focusing from luxury and extravagance. Cash crunch in addition to Pandemic leads to acerbity across the globe, which in turn results in diminished economic opportunity. The IMF Managing Director K. Georgieva has acknowledged, "World economy is in recession and way worse than the global financial crisis of 2008. It is a crisis like no other and never in the history of IMF, we have seen the world economy coming to a standstill."

As the lockdown period gradually relaxed, some progress of upward trajectory was witnessed in food processing, drugs and pharma sectors as a demand compared to other sectors. Therefore, maintaining apposite financial resources and cash flow are being a major challenge for the Indian economy.

A Glance of BOP with Respect to Covidnomics

Balance of Payment is a statement, which indicates whether a nation has surplus or deficit of funds. It reveals a nation's financial and economic status. In words of B.J. Cohen, "It shows the country's trading position, changes in its net position as a foreign lender or borrower, and changes in its official reserve holdings." According to the Current Account Balance (CAB) of India, a surplus of USD 19.8 Billion (3.9% of GDP) in quarter 1 of 2020-21 has been seen. A survey indicates, the Global trade has projected a recovery of 2.9% in 2020. According to UN Report, India has been figured among top 15 economies which witnessed an adverse impact with respect to Trade. In order to combat the impact of Corona Virus pandemic, many nations around the world are taking several steps including Lockdown and Precautionary measures as per the World Health Organization guidelines.

The below given table and diagram is a representation of India's BOP Standard, according to IMF sources.



	2016	2017	2018	2019	Q1 2020	Q2 2020
FINANCIAL A/C	-13600.7	-39559	-64011.1	-30360.1	1337.8	19438.1
CAPITAL A/C	136.8	37.3	-123.1	-1155.6	-19.4	-780.3
CURRENT A/C	-12113.8	-38167.7	-65599.4	-29762.9	584.4	19797.9

Figure 1

Pandemic's Effect on Current Account

Current account records a nation's net earnings, transfer payments and investments over a period of time. According to a statistical survey, an increase to 7.7 billion is witnessed in India's net overseas investment income payments. In accordance with RBI report a sharp contraction in the trade deficit to a tune of USD 10.0 Billion in the First Quarter of current year 2021. In general sense, current account deficit refers to the difference between outflow and inflow of foreign exchange, where outflows > inflow. In order to curb Current Account Deficit, exports can be enhanced and minimize the Non-Essential Imports to have balanced Current Account. The graph below, representing CAD, displays a gradual recovery over the deficits, caused due to the pandemic. With context to phased unlocks, trading inside and outside the country gradually begun with effect to the new consumption pattern.

Current Account Deficit (Bar Graph)

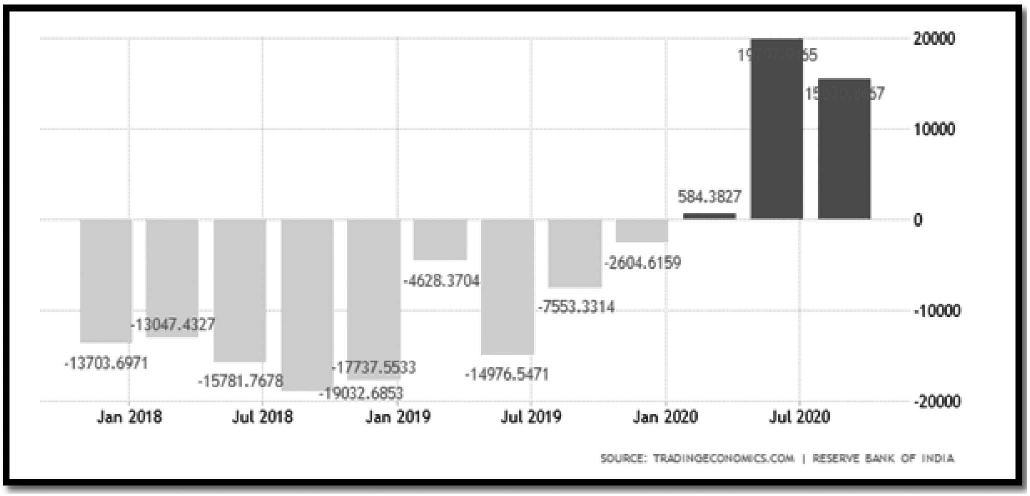


Figure 2

Sources taken from Tradingeconomics.com

Towards Sustainability and Resilience

The unexpected outbreak of the Novel Coronavirus Pandemic has horrendously dynamized the lifestyle of the mankind. Global economy has attained an unfavorable smack, regarding pandemic's EXIM trend, shifts in service and consumption pattern. This rampant has led the world economy to a prodigious recession. While, it is a good time for Indian economy to swing towards sustainability and resiliency. According to the Global Rating Agency, "India's economy will experience a record contraction in fiscal 2020-21, largely owing to the global COVID-19 Pandemic. We expect real GDP growth to recover from Fiscal 2021 onwards." The Government of India should endeavor strategies and plans, to emerge again from the shadows of economic and trade disruptions concerning to the Pandemic.

WEBSITES

1. www.ncbi.nlm.nih.gov
2. www.rbi.org.in
3. www.businessworld.in
4. www.thehindu.com
5. www.bloombergquint.com
6. www.investindia.gov.in
7. https://economictimes.indiatimes.com
8. www.eximbankindia.in
9. mospi.nic.in
10. http://spark.adobe.com

SURVEY ON AWARENESS OF GOOD HEALTH AND NUTRITION AMONG POPULATION GROUPS

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ABSTRACT

The study aims at determining the awareness of people between the interrelationship of nutrition and health. It focuses on examining their knowledge and attitude towards nutrition and health and guiding them to practice immunity enhancing practices. The survey was conducted through Google forms with 280 respondents and was open to the public for a span of 2 days. The present study showed that the awareness on nutrition and health seems to be high, however guidance on the right practice needs to be inculcated. The study also shows that the population is ready to adapt nutrition based health practices for immunity development.

Keywords: *Nutrition, Health, Immunity, Dietary Survey, Dietary Recommendations.*

INTRODUCTION

Nutrition is the science of foods, the nutrients and other substances therein, their action, interaction and balance in relationship to health and disease. Health is the state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (Srilakshmi, B., 2018). An ideal balance of having a balanced diet consisting of a range of vitamins and minerals, combined with healthy lifestyle factors like adequate sleep and exercise and low stress, most effectively primes the body to fight infection and disease which influences our immune system. Thus, the survey was conducted to understand the knowledge of the general public on nutrition and health (Chan, H.T.H., 2020).

Aim

To study the awareness in nutrition and health on various aspects through survey.

Objective

- To study the knowledge of people on the interrelationship between nutrition and immunity.
- To know and analyse the different lifestyle approaches of people with respect to food and exercise.
- To study the practicality of nutritional recommendations.

MATERIALS AND METHODOLOGY

Sampling Methodology: Random probability sampling.

The survey was conducted through Google forms with a structured questionnaire. The survey was open to the public for a span of 2 days (10th and 11th November 2020). The population included individuals in the age of 18+. The total responses received were 280. The survey was conducted in English language.

RESULTS AND DISCUSSION

Background Information

The population was categorized as 18-25 years (75.5%), 25-40 years (10%), 40-60 years (11.1%) and above 60 years (3.2%). Out of 280 subjects, 86.8% were women and 13.2% were men. In the survey, 95.3% people are sedentary workers and 4.7% people are moderate workers in terms of occupation. No heavy workers have been recorded in terms of occupation.

Eating Pattern

Among the respondents, 58.9% were non-vegetarians, 32.1% were vegetarians, 3.9% were ovo-vegetarians, 1.8% were vegans and 3.2% followed other forms of diet. 13% females and 10.8% males have food allergies and a larger population among both males (89%) and females (86.8%) are devoid of food allergies. The common food allergies include coconut, soya milk, mutton, egg, dry fish, corn, cheese, pineapple, brinjal, MSG, shell fish and chicken.

Physical Activity

The physical activity of the population according to their workout regime was estimated to be 38.6% performing light weight exercise, 24.6% performing moderate exercise, 14.3% performing heavy exercise and 22.5% never perform exercise.

BMI Classification

The BMI was categorized, according to classification given by Asia-Pacific report WHO, IASO, IOTF 2000 (World Obesity, 2020). The BMI calculations shows, 17.5% are underweight, 35.37% are in normal range and 48.9% are overweight.

Table 1: Percentage distribution of subjects according to BMI Classification (Asia-Pacific report WHO, IASO, IOTF 2000)

Classification	BMI %
Underweight (<18.5)	17.5
Normal range (18.5-22.9)	35.57
Overweight (>=23)	48.9
At risk (23-24.9)	15
Obese 1(25-29.9)	20.35
Obese II(>=30)	13.57

The Answers Based on the Knowledge of the Population Were:

- A large population (53.2%) though widely believes that 1 cup of green tea a day is the right amount, the correct answer is 2-3 cups (answered by 41.4%), and also 53.2% assumes caffeine cannot be a part of green tea. However, the correct answer is YES (answered by 46.8%).
- In egg one-third of the population assumes it is only the yolk (32.1%) or only the white (30.4%) that is healthy. The correct answer is both yolk and white (answered by 36.1%).
- Among oils, 40.2% of the population answered olive oil which is the correct answer, but, 24.7% people think it could be groundnut oil, 18.5% of the people thought it to be coconut oil and 10.5% of the people thought it to be sesame oil. Regarding fat, fibre and protein content of nuts, the majority of the population (61.1%) had answered 'All of the above' (given choices were walnut, Almond, peanut, all of the above) but, 20.4% people think it could be almonds.
- The majority of the population answered 'YES' (78.9%) to vitamin A being essential for immunity. A majority of people think it is carrot, (42.1%), that is the richest source of vitamin A (out of carrot, agathi keerai, orange, all of the above). But the correct answer is agathi keerai (answered by 26.1%).

Dietary Habits (Attitude)

Accessing the various dietary habits of people showed the wider awareness of nutritional facts. There were also some adaptations of people that are contradictory to healthy eating.

- Breakfast is highest consumed around 9.00 AM (51.8%) followed by after 10.00 AM (43.2%). Lunch is highest consumed around 1-3 PM (81. 4%).Dinner is consumed highest around 9:00 PM. Ideal mealtime is followed by the majority while breakfast seems to be shifting.
- Among cereals, rice is the most consumed daily cereal (77.14%) with the largest portion being 75 g/day (raw rice) followed by wheat twice a week and ragi, corn and millets at least once a week. Among pulses red gram dal (25.35%) and Black gram dal (25%) are

the highest consumed daily pulses, followed by bengal gram dal at twice a week and green gram, rajmah and soya at least once a week. Other whole grains and pulses are preferred once a week

- Among the vegetables, carrots (17.3%) is the highest consumed vegetable followed by potato (13.68%), beans (12.3%) and lady's finger (11.78%). On the other hand, ash gourd, lettuce, ridge gourd, colocasia, sweet potato and other seasonal vegetables are the least consumed vegetables. Green leafy vegetables are preferred at the most twice-thrice a week. Fruits are consumed by a majority (41.42%) on a daily basis. Among fruits, apples and bananas (19.86% both) are the most preferred fruits to be consumed, followed by orange (16.19%). On the other hand, pears, kiwi, avocado, strawberry, plum, litchi, red dragon and seasonal fruits are the least consumed (0.5%). The truth that people lack the awareness of the need to consume seasonal vegetables and fruits has become implicit.
- Most non-vegetarians, prefer to consume non-vegetarian foods once a week (25%). Eggs are preferred about thrice a week (20.35%). Most preferred non- vegetarian foods are egg (55.4%), followed by chicken (53.6%).
- Among visible fats, oil is the most consumed fat source (81.07%) consumed on an everyday basis, followed by ghee at twice/thrice a week and butter thrice a week. However, refined oils (59.6%) are the most preferred oil which is another major dietary practice that needs a change.
- Among dairy products, milk is the highly consumed daily product (73.57%) with 2-3 cups being the largest portion followed by curd and buttermilk, with paneer at least once a week and cheese rarely/never.
- Among direct sugar, white sugar (64.64%) is the highest consumed everyday sugar, with jaggery and honey at least once a week.
- The majority of the people are not feeding their babies. Among those feeding their babies prefer to feed using both breastfeeding and formula/breast milk substitutes. This is another major concern today despite high awareness of breast milk needs.

Adaptability of Dietary Recommendation (Practice)

Adaptability of various dietary recommendations provided by us for various age groups were found to be varying. From a total of 280 responses, under practice section, 212 responses were from 18 to 25 years, 28 from 25 to 40 years, 31 from 40 to 60 years and 90 from above 60 years.

- **18 to 25 years:** The response to the preferences of ragi or oatmeal cookie instead of cream biscuit was accepted (55.4%) by the majority of the teenagers and young adults and. So, we can conclude that the new generation is aware of the harmful effect of cream biscuits and easily approachable to the new healthy snacking form. Among the preference of fruit as an immune booster for breakfast, the majority of them selected citrus fruits (49.8%) like orange, lime etc. while 34.7% preferred a cup of apple. In the preference of time during a day to consume an immune ball made of dry fruits and nuts like almonds, walnut, raisin, dried fig, dates, apricot etc.) were midmorning (39%). 30.5% for tea time and 28.2% for breakfast. Very few opted for lunch and dinner.

- **25-40 years:** The choice of 'Giloy powder' with warm water in their daily routine for boosting immunity, the majority of the participants 57.1% had a dilemma whereas 14.3% accepted it. On advised to consume thoodhuvelai in the form of chutney or thogayal, the majority of the participants accepted it (53.6%)
- **40-60 years:** During sleep our immune system releases proteins called cytokines which helps to get rid of infection and inflammation in the body. The sleep period of 70% of the participants was 6 to 8 hours and 30% less than 6 hours a day (Besedovsky, L., et al., 2019). The preferences for an immune boosting drink as a morning drink only 10% preferred orange juice, 13.3% preferred beetroot with ginger juice and 20% preferred carrot with ginger juice. But majority of them (56.7%) were not ready to consume the given set of juices as a morning drink. The preferences among healthy snacks instead of processed ones, 60% opted for sprouted salad, 3.3% opted for banana smoothie, steamed sweet potato snacks by 16.7% and 20% of the participants were not interested in changing their snacking habit.
- **60 years above:** Herbal dosa; that contains curry leaf, mint, coriander, tender neem leaf, tulsi, betel, karpuravalli (Mexican mint) is rich in antioxidants that helps to boost immunity was preferred for breakfast or dinner by majority (77.8%). Among the preferences to consume karpuravalli rasam for post-COVID-19 scenario majority of them (33.3%) selected weekly twice, 11.1% was ready to consume four times in a month, while 11.1% selected monthly twice.

CONCLUSION

The study brings out the various attitudes on dietary adaptations and brings out unhealthy choices by individuals despite high nutritional awareness. Participants displayed a range of dietary typologies, and therefore dietary practices. Hence, the individuals have to be motivated more to adapt and practice healthy living.

REFERENCES

1. Srilakshmi. B., (2018). Nutrition Science, New Delhi: New Age International Publishers.
2. Harvard T.H. Chan. (2020). Nutrition and Immunity. The Nutrition Source.
3. Besedovsky, L., Lange, T., & Haack, M. (2019). The Sleep-Immune Crosstalk in Health and Disease. Physiological reviews, 99(3), 1325–1380.
4. World Obesity. (2020). Obesity classification. World Obesity.

WEBSITES

1. https://www.hsph.harvard.edu/nutritionsource/nutrition-and-immunity/
2. https://doi.org/10.1152/physrev.00010.2018
3. https://www.worldobesity.org/about/about-obesity/obesity-classification

A STUDY ON THE IMPACT OF INTERNET DURING COVID-19 PANDEMIC

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ABSTRACT

This world has seen great many pandemics. Pandemic is a term used for epidemic of a disease, that is spread across a large region. The Spanish flu (1918), the Hong Kong flu (1968), the Asian flu (1958), the SARS (2002), the MERS (2012) are some examples of it. In this, the Severe Acute Respiratory Syndrome (SARS), the Middle East Respiratory Syndrome (MERS), the Novel Corona virus or the Severe Acute Respiratory Syndrome – Coronavirus - 2 (SARS- CoV- 2) or the COVID-19, comes from the virus family of Corona. The COVID-19 was first identified in Wuhan, the capital of a Chinese province, Hubei. Since the disease is contagious in nature and is spreading to almost all the countries in a rapid speed, the lockdown system is implemented and the people (both symptomatic and asymptomatic) are quarantined. Wearing masks and maintain social distancing is a must in the current scenario. After implementing the lockdown worldwide, people's life has changed upside down. Internet has entered in almost all areas. As per the News18 report, internet traffic saw 40% spike in March alone. Usage of internet includes: purchasing online, getting updates and watching the highlight reels on social media, reading books online, attending classes on line, collecting information, telecommuting and much more. All these changes come under the 'new normal'. But the question is, will this new normal have a good impact on us? Or the other way round?

***Keywords**: COVID-19, Digital education, Tele commutation, Internet.*

INTRODUCTION

In recent times, internet has undeniably taken a chief position in everybody's lives. The users have already started to use Artificial Intelligence (AI) as well as aiming for the 5th Generation and network autonomous driving. Plus the researchers are improving and updating our technology day by day, making people's lives technology-based. With the spread of the Coronavirus, internet has entered in almost all walks of life. Lately, we are using internet extensively for educational purpose also.

Objectives of the Study

The purpose of this article is:

- To study the impact that the internet has made in the lives of individuals during the lockdown.
- To probes both the pros and cons of the internet at the ground level.

Statement of the Problem:

During these times of pandemic, people's routine has been paused. With this pause, came a new normal with Internet of Things (IoT) and many more ground-breaking ideas. But the problem exist in the availability of internet not only in urban but also in rural areas. Furthermore, the availability of smartphones and other devices is poor. Hence, the present study entitles to pinpoint the problems present in using social media, taking on-line classes and telecommuting.

Review of Literature

Internet usage surged from 40% to 100% compared to pre-lockdown levels. Along with the internet usage, the internet traffic too has seen a rise especially in cities like Bangalore. Once this pandemic gets over, the workers would demand 'no-digital hours' owing to the issues related to technostress – especially work overload and presenteeism. Also, the authors have anticipated increase in scams and frauds post pandemic. But when it comes to internet connectivity, people who are not connected with internet are being left out. In short, along with the rise in internet usage, rose online frauds and connectivity issues. **(De, Pandey and Pal, 2020)**

Social media usage during this COVID-19 has played a main role spreading false information and creating anxiety among the younger population about the virus. It has a significant impact on spreading fear and panic related to the outbreak. Though people use it as a tool to get updated, it has impacted in negative way depending upon person's gender, age and education. **(Ahmad and Murad, 2020)**

The usage of digital services are in all time high during this COVID-19 pandemic, along with the worry about the internet access. The individuals who are not tech savvy, with poor internet access, are left out in this digital uptake. The internet sources are used mostly by the tech savvy and people with better internet connectivity. But this pandemic has 'pushed' people to update and adopt the novel ways to communicate with each other's. This push will in return lead the way for making new choices and preferences. Nevertheless, only that habit which outlasts the pandemic could last evermore. **(Nguyen, Gruber, Fuchs et al, 2020)**

The common problems prevailing in the online classes includes loss of interest, poor internet connections, speed and cost of internet, non-availability of devices, difficulties in practical sessions, ineffective communication and etc. The study observed an appalling effect on the students and depletion in their progress; while students in some countries reported a positive impact on their learning experience. The researcher had also listed out some recommendations like: providing students with needed devices and internet, improving the method of teaching, enhancing teacher-student interaction, decreasing the amount of homework, so as to reduce student's stress, conducting online quizzes to measure the quality of learning, extending the time to solve the tests and many more. **(Mahdy, 2020)**

The impact of the pandemic in the work life of the employees will be short- lived. The study also highlighted the importance of on-line mode of recruitment, selection, training in lieu of face-to-face training and how it will impact the organisation's values and culture. The researcher has found out a conflict between the work and the family roles, since the increased suspension of schools and the constant concerns over the health and safety of the family, make it more difficult than ever to maintain adequate work- family role boundaries. **(Carnevale and Hatak, 2020)**

Research Methodology

The present study is an analytical study to understand the impact of internet in the lives of individuals during this pandemic. The data required for the study was collected from both primary and secondary sources. The primary data is obtained through a pre tested questionnaire. The sample size for the study is 65 respondents which includes students, people working in private sector and retired individuals. The secondary data was collected from the available electronic materials on-line. Percentage analysis was used on the data collected for the study.

Analysis of Data

Table 1: Demographic Profile of Respondents

S. NO	AGE	RESPONDENTS
1	11 – 20	84.6%
2	21 – 30	6.2%
3	31 – 40	0%
4	41 and above	9.2%
S. NO	**GENDER**	**RESPONDENTS**
1	Male	9.2%
2	Female	89.2%
Source: Primary data		

***Table 1: Shows the Demographic Profile of Respondents in terms of Age and Gender*.**

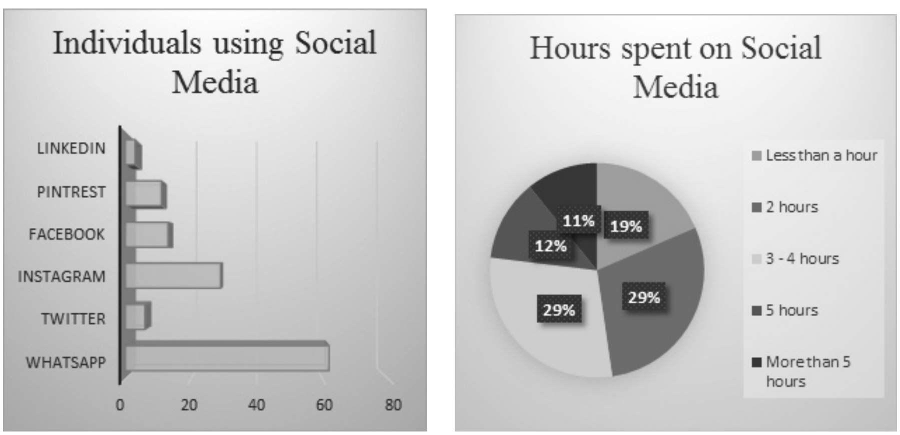

Figure 1: Number of Individuals and their Time Spent on the Social Media

From figure 1 it is evident that the majority of student and working population is using WhatsApp followed by Twitter, Instagram, Facebook, Pintrest, and LinkedIn. Nearly 58 %of the population spent 2- 4 hours on an average on social media. 12% of the population spent nearly 5 hours on social media. 11% of the population spent more than 5 hours on social media.

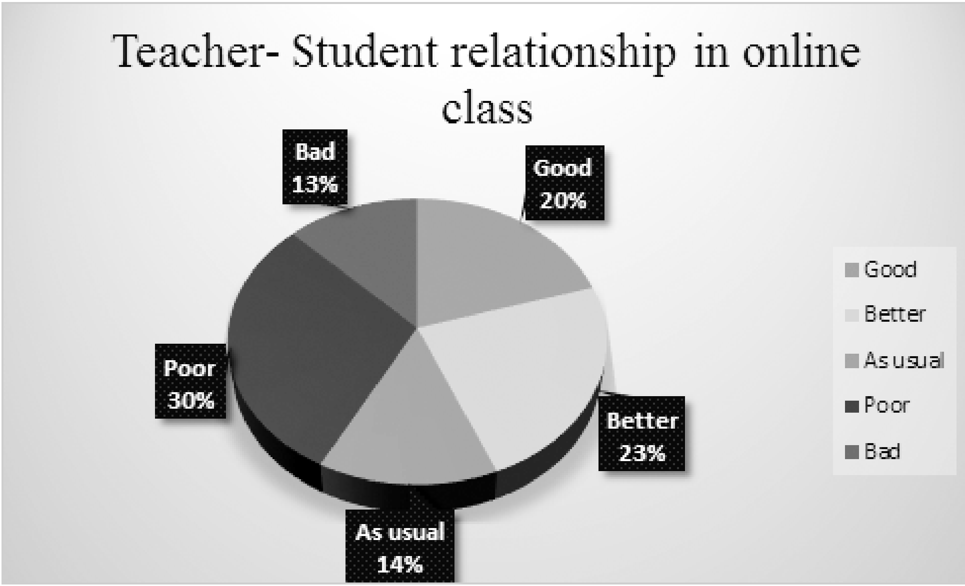

Figure 2: Teacher–Student Relationship During Online Class

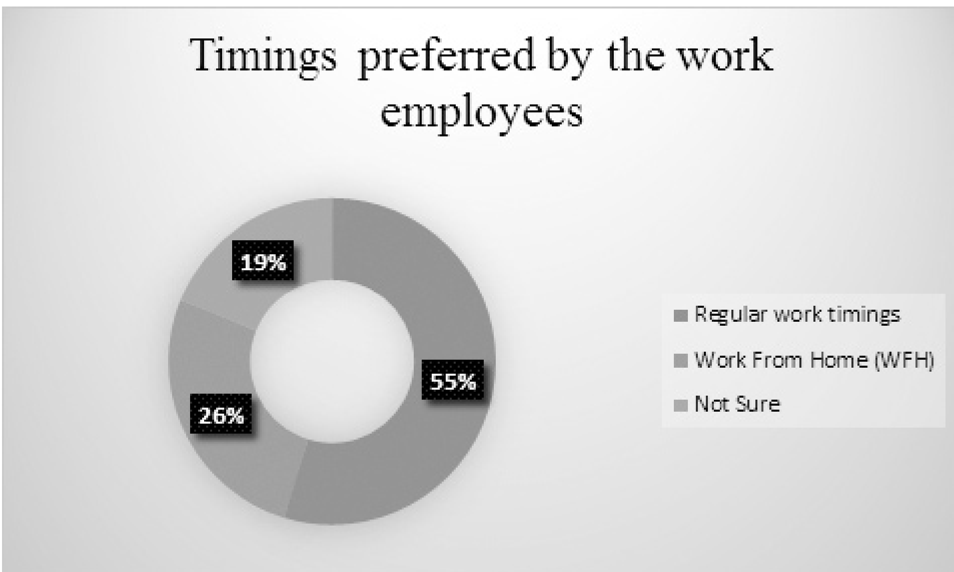

Figure 3: Timings Preferred by the Work Employees

Findings of the Study

- 56.9% of the population agreed that social media can be used in a productive manner.
- 58.5% of the population agreed that social media has made a positive impact on them.
- 43.1% of the respondents acknowledged that using social media was addictive.
- 53.1% of the students voted for off-line class; 31.3% of the students voted for on-line class; 7.8% of the students voted for e- learning.
- 95.3% of the students had already used internet for academic purpose.
- 54.7% of the respondents opted for regular work timings.
- 56.9% of the population agreed that their work and personal life is not well- balanced.

Table 2: Common Problems Faced by Students and Working Population

STUDENTS	WORKING POPULATION
Often facing network issues	Unbalanced work and personal life
Lack of concentration and interaction	Heavy workload
Distractions and miscommunication	Stress and miscommunication
Health issues caused by the usage of smart phones	Working overtime
Source: Primary Data	

Table 2 exemplifies the common problems encountered by both students and working professionals

Suggestions

The following are some of the suggestions offered based on the study:

- Providing students with essential materials to study.
- For time management issues make a to-do list, create deadlines and reminders.
- The instructor can organise groups and organise webinars to enhance the learning experience.
- Make the class interesting by conducting quiz competitions and debates.
- To manage the work and personal life, manage your time, set reminders, take a break once in a while.
- Ask questions. It will definitely reduce miscommunications.
- Do not engage in social media when in work.
- Be clear about your break time and when you are leaving your class or work.
- Delete your ‘social’ accounts if you are addicted to it.
- Commit your time to your hobbies.

CONCLUSION

It is clearly visible that without internet, surviving this pandemic would have been a difficult task. Albeit internet has its own demerits, the merits win over them. The way people use the internet, determines its impact. Thus, it is all in the hands of the public whether to use internet prudentially or the way it impacts us calamitously. Better the usage, better the impact.

REFERENCES

1. De, Pandey and Pal (2020) Impact of digital surge during Covid-19 pandemic: A viewpoint on research and practice International Journal of Information Management, 55.
2. Ahmad and Murad (2020) The Impact of Social Media on Panic During the COVID-19 Pandemic in Iraqi Kurdistan: Online Questionnaire Study, J Med Internet Res 22(5).
3. Nguyen, Gruber, Fuchs et al, (2020) Changes in Digital Communication during the COVID-19 Global Pandemic: Implications for Digital Inequality and Future Research Social Media + Society, 6.
4. Mahdy, (2020) The Impact of COVID-19 Pandemic on the Academic Performance of Veterinary Medical Students Frontires in veterinary science, 7.
5. Carnevale, J. B., & Hatak, I. (2020) Employee adjustment and well-being in the era of COVID-19: Implications for human resource management Journal of business research 116, 183–187.

WEBSITES

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7280123/
2. https://www.jmir.org/2020/5/e19556/#:~:text =We%20found %20a%20significant%20 positive,years%20are%20facing%20psychological%20anxiety
3. https://journals.sagepub.com/ doi/10.1177/2056305120948255
4. https://www.frontiersin.org/articles/10.3389/fvets.2020.594261/full
5. https://www.ncbi.nlm.nih. gov/pmc/articles/PMC7241356/
6. https://www.zdnet.com/article/singapore-allows-schools-to-resume-zoom-use-for-home-based-learning/
7. https://www.ft.com/content/19d90308-6858-11ea-a3c9-1fe6fedcca75
8. https://zapier.com/blog/remote-work-challenges/
9. https://www.readersdigest.ca/health/healthy-living/social-media-addiction/
10. https://www.insider.com/how-to-break-social-media-addiction
11. https://www.timecamp.com/blog/2018/03/top-6-challenges-of-a-remote-work-and-how-to-overcome-them/

12. https://www.stoodnt.com/blog/top-5-challenges-faced-by-students-in-online-classroom-and-how-to-solve-them/
13. https://www.unicef.org/northmacedonia/stories/learning-online-problems-and-solutions
14. https://www.sciencedirect.com/science/article/pii/S0010440X20300225

E-SHOPPING BEHAVIOUR OF WOMEN (A STUDY WITH REFERENCE TO NYKAA)

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ABSTRACT

Online shopping is a recent trend in the field of e-business and undoubtedly, it is going to be the future of shopping in the world. Most of the companies are running their online portals to sell their products or services online. Women consider cosmetics as a necessary part of routine life and purchase them regularly. My studies were based on an online cosmetics app called Nykaa. Since women tend to prefer online, the thrust of the study is to understand the e-shopping behaviour of women towards cosmetics and the factors influencing those shopping behaviour. Primary data was collected from 100 respondents in Chennai through a structured Questionnaire and convenience-sampling method was adopted for the study. Secondary data was collected from information published through journals, books, and research articles.

The study found that customers prefer the quality of the product as the major criteria for buying cosmetics. Factors such as 'convenient and time-saving', 'product variety' are the major reasons to purchase cosmetics online. The study revealed that Nykaa can make available a wide range of products at reasonable prices and attention can be given to the delivery of quality products to keep hold of their customers. Cosmetics have occupied a significant place in human life in one way or another. Therefore, cosmetics market becomes more complicated, competitive and it will be a leading industry in the future.

***Keywords**: NYKAA, Women, E-Shopping, Cosmetics, Quality.*

INTRODUCTION

E-Shopping (electronic shopping) refers to researching and purchasing products & services online. It is a form of e-commerce that allows customers to buy online. Other names of e-shopping are e-shop, e-store, Internet shop, and web-store and Online store. An online shop arouses the physical similarity of buying products as well as services from an internet shop. This process is also called business-to-consumer online shopping. Here the consumer goes online, landing on a seller's website, selecting something, and arranging for its delivery. The buyer either pays for the goods or services online with a credit or debit card or upon delivery. Online shopping has been around for about twenty-five years. It has grown in popularity significantly. For example, Amazon.com sells nearly all of its goods online through its e-commerce platform. Online Shopping behaviour is a kind of individual's overall perception and evaluation of products or services by the consumers. Good product quality, free shipping experience, easy returns policy, review from customers, and special purchase are the factors that influence purchase decisions online.

Literature Review

Abhilash Sugunan Nair (2016) a study on "**A Quantitative Analysis on Online Shopping Pattern of Working Women in India**" identified the reasons that discourage female online shoppers. The questionnaires were collected from 120 respondents. The study was analysed by using Tabulation, Pie chart and Percentage analysis. The study found that compared to male shoppers, female shoppers favour simplicity in the buying process. The study concluded that the popularity of online shopping among working females in India is on the rise.

Rahul Kumar (2016) in his project titled **"The Future of Online Shopping in India"** had determined the information to marketing professionals to develop a better marketing strategy to enhance online shopping. Convenience sampling method was used and questionnaires were got filled by email and personal interview methods with 150 respondents. Simple charting and tabulation tools are used to understand the behaviour of the respondents for online shopping. According to the research, various online shoppers had shown fear of unsecured transactions in online payment and misuse of personal information given by online shoppers. The analysis discussed in the above section had documented that Indian customers were highly dependent on online shopping websites.

C. Arul Jothi and A. Mohmadraj Gaffoor (2017) in their research titled "**Impact of Social Media in Online Shopping**" had determined the post-purchase behaviour of consumers. Data was collected from 70 respondents through questionnaires. Percentage Analysis, Cross Tabulation, Chi-Square Test and Mean Score were used to analyse the data. The study found that male was purchasing a higher number of products through online than female. The interference of the research was that people use the combination of various sources for making final purchase decisions.

Neha Gupta and Dr. Deepali Bhatnagar (2017) in their research titled **"A Study on Online Shopping Behavior among the Students"** identified the behavior of the students and factors influencing while they buy the product. The data was collected from 100 respondents by questionnaire given to students while the secondary data was collected through published sources like magazines, journals, etc. and has been analysed through simple random sampling. The research found that price played an important role and clothing was the highest buying product online. The study concluded that online had truly revolutionized and influenced our society as a whole and the internet is often referred to as a borderless market.

Jaimin Kamleshbhai Patel (2018) in his research titled "**Study of Consumer Perception on Online Shopping**" analyzed the factors affecting consumer perception towards online shopping. A sample size of 100 consumers had been taken and primary data had been collected through a structured questionnaire. The study had been analyzed with the help of factor analysis. The analysis revealed that mostly the youngsters are attached to online shopping and hence the elder people do not use online shopping much as compared to the younger ones. The study concluded that the customer found it was very flexible and in the case of online shopping, it delivered products quickly.

Madasu Bhaskara Rao, Ch Lakshmi Hymavathi and M Mallika Rao (2018) in their study on "**Factors Affecting Female Consumers Online Buying Behavior"** had examined online buying behavior through demographic characteristics of female online shoppers. The sample size of the study was 316 respondents by distributing copies of self-administered questionnaires. Data was analysed using IBM SPSS 20, Simple random sampling method, Factor Analysis, and Pilot study. The research attempted to found out the triggers that influence shopper buying behavior in online retail formats. The study concluded that the factors viz., ease of use and convenience, security, utility, time effectiveness, outbound logistics, and feedback as the determinants of female shopper buying behavior online.

Objectives

1. To understand the shopping behaviour of consumers towards cosmetics.
2. To study the reasons for buying cosmetics online.
3. To analyse the factors that influence e-shopping behaviour of consumers towards Nykaa.
4. To analyse the satisfaction level of consumers towards services rendered by Nykaa.

Research Methodology

A descriptive and analytical study was made based on both primary and secondary data. Primary data was collected from various female Nykaa users in Chennai.

1. Period of Study

The primary data required for the study was collected during November 2019 – February 2020 by contacting female respondents in Chennai.

2. Research Site and Unit of Analysis

The primary data required for the study was collected by contacting female Nykaa users of different age groups in Chennai.

3. Sampling Design

The primary data was collected from 100 female respondents of different age groups in Chennai through structured questionnaire and convenience sampling method was adopted for the study. The secondary data was collected from the information published from journals, books and research articles.

4. Questionnaire Structure and Design

The Questionnaire was divided into four parts.

Part I deals with the demographic profile of the respondents.

Part II deals with the perception of consumers towards online shopping.

Part III deals with the e-shopping behaviour towards Nykaa.

Part IV deals with the satisfaction level while purchasing in Nykaa.

5. Sample Description

The primary data required for the study was collected by contacting female respondents of different age groups in Chennai.

6. Framework of Analysis

The collected primary data was statistically processed, classified and tabulated by using appropriate methods. Tables, figures and statistical results had been derived with the help of computer software package called SPSS (Statistical Package for Social science). Percentage analysis, Henry Garrett ranking technique, weighted average test were used to analyse the data by using SPSS Package. Chi-square was applied to investigate whether there is any relationship between marital status and amount spent on buying cosmetics.

Limitations of the Study

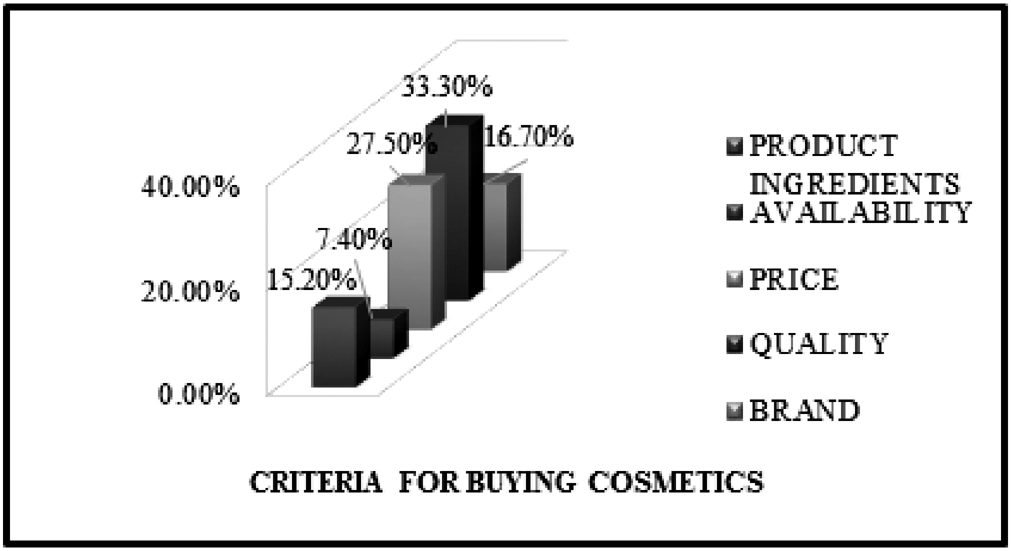
This study is not free from limitations. Primary data had been collected through questionnaire and the results of the study suffer from the limitations of such instruments of data collection. Adequate representation had been given only to respondents in Chennai and it also suffers from the limitation by analyzing only the female respondents.

Analysis

- As my first objective is to understand, the **"Shopping Behaviour of Consumers towards Cosmetics"** and it was put to percentage analysis. 27.5% of respondents prefer price as a major criteria for the purchase of cosmetics.

Table 1: Criteria for Buying Cosmetics

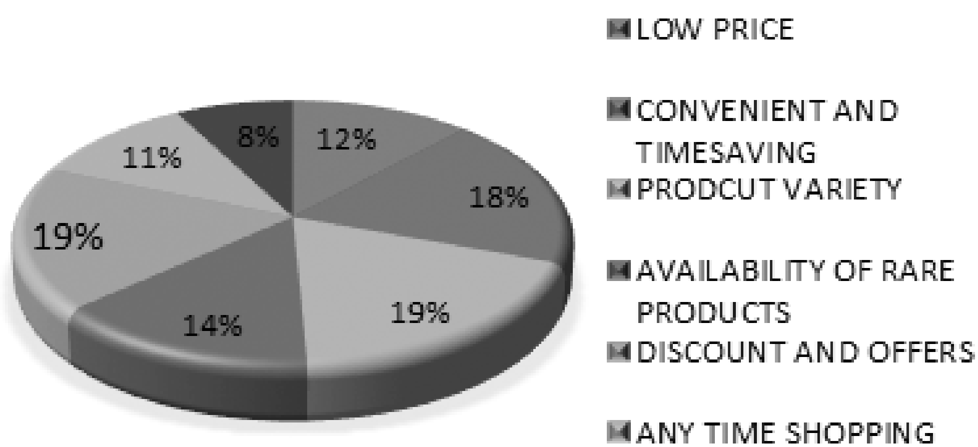
Criteria for Purchase	Percentage
Product Ingredients	15.2%
Availability	7.4%
Price	27.5%
Quality	33.3%
Brand	16.7%
Total	100.0%



- My second objective is to study the **"Reasons for Buying Cosmetics Online"** and it was analysed using percentage analysis. 18.7% of respondents chose the reason as convenient & time saving and product variety as a main reason for buying cosmetics online.

Table 2: Reasons for Online Purchase

Reasons for Online Purchase	Percentage
Low Price	11.9%
Convenient and Timesaving	18.7%
Product Variety	18.7%
Available of Rare Products	14.2%
Discount and Offers	17.8%
Any Time Shopping	11.0%
Home Delivery	7.8%
Total	100.0%



REASONS FOR ONLINE PURCHASE

- My third objective is to analyse the "**Factors that Influence E-Shopping Behaviour of Consumers towards Nykaa**" and it was subject to Garrett's ranking technique. Among the 8 attributes, '**Free Home Delivery**' was ranked I with a mean score of 52.17, '**Discounts, Offers and Combos**' was ranked II with a mean score of 51.59.

Table 3: Attributes Influenced to Purchase Frequently in Nykaa

Particulars	Total	Mean Score	Rank
Availability of wide range of products	4980	49.8	IV
Low price	4992	49.92	III
Value for money	3825	38.25	VIII
Discounts, offers and combos	5159	51.59	II
Scheduled delivery	4976	49.76	V
User friendly	4883	48.83	VI
Free home delivery	5217	52.17	I
Easy returns	4098	40.98	VII

- My fourth objective is to analyse the **"Satisfaction Level of Consumers towards Services Rendered by Nykaa"** was put to **Weighted Average test.** Among the 14 factors, Rank I was assigned to **'There is an advantage to shop at any time which is not available in stores'** with an average score of 23.87, Rank II was assigned to **'Nykaa fulfils my need and desire to buy as it has wide range of products'** with an average score of 23.53.

Table 4: Consumers Satisfaction Level on Various Factors Rendered By NYKAA

Factors	Average	Rank
I prefer to buy in Nykaa only if review rating is good	23.2	V
There is an advantage to shop at any time which is not available in stores	23.87	I
I will prefer Nykaa only if prices are lower when compared to the actual products price	22.53	XII
I feel that Nykaa app is user friendly compared to its official website	23.13	VI
I would like to try new products launched by Nykaa site due to its trustworthiness	22.8	IX
Nykaa notifies me via mail which facilitates me to grab the offers	23.47	III
I recommend this website to friends/colleagues	23	VII
I think product description could be even more accurate in Nykaa	22.73	XI
I think product description could be even more accurate in Nykaa	22.8	IX
Nykaa fulfils my need and desire to buy as it has wide range of products	23.5	II
Nykaa could facilitate easy returns for customers	21.93	XIV
I intend to purchase frequently in Nykaa after my positive shopping experiences	23.47	III
Nykaa concentrates on product mix strategy by offering wide assortment of products to their target customers	22.93	VIII
Offers on special days creates enthusiasm/ urge to buy	22.4	XIII

Other Major Findings

- 24.8% of the respondents prefer Lakme among various brands like Dazzler, Maybelline, L'Oreal and Mac.
- 37.2% of the respondents prefer the Amazon website among Nykaa, Flip kart, The skin store, Feel unique, Purplle and Jabong for online shopping
- 86% of the respondents were not a regular customer of Nykaa.
- 50% of the respondents were satisfied with the Nykaa app and their services.

Chi – square test: Relationship between Marital Status and Average amount spent on buying cosmetics

Table 5: Chi-Square Test

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.291(a)	4	.863
Likelihood Ratio	1.298	4	.862
Linear-by-Linear Association	.633	1	.426
N of Valid Cases	100		

Inference

Since P value (0.863) is greater than significance value (0.05), the null hypothesis is accepted. Hence, there is no significant relationship between marital status and amount spent on buying cosmetics.

Suggestions

- It is very helpful to purchase all cosmetics products under one platform, but it can cut down the cost of products to be more customer-friendly.
- Quality of the product plays a vital part in the purchase decision of consumers. Therefore, to retain them, attention can be on the delivery of quality products.
- They must ensure quick delivery of a product without any defectives to enhance their customer satisfaction.
- Breakup of cost of the product and many hidden costs might be deceiving.
- They must concentrate more on the pricing of products because sometimes low-quality products are priced higher than retail outlets to build confidence among the customers.
- It can advertise frequently to attract more rational and new customers.
- They should devise policies and strategies to magnetize more people in this segment in the future also.

CONCLUSION

Online shopping is becoming popular day by day. Today, online shopping was increased considerably than in-store shopping due to the availability of a wide range under one platform.

Understanding the attitude of women consumers irrespective of the knowledge, experience, and the gender gap is complex particularly concerning the usage of the Internet, computer and online shopping. For them, shopping involves hedonic motive and enjoyment. Women consider cosmetics as a necessary part of routine life and purchase them on a regular interval, which is a positive insight for Nykaa.

Online women shoppers are motivated by convenience, price, efficiency, and loyalty. Word of mouth from friends and family plays a major role to change their attitude towards e-shopping. Nykaa builds long-term loyal relationships to become more women customer-centric. The overall study proves that women shoppers have positively perceived online shopping. The services provided by Nykaa are satisfied by the women shoppers. Therefore, Nykaa has secured a good position in the market through Brand promotion and consumer satisfaction.

REFERENCES

1. Abhilash Sugunan Nair (2016), "A Quantitative Analysis on Online Shopping Pattern of Working Women in India" International Journal of Business and Administration Research, Vol. 2, Issue14 [96] (IJBARR E-ISSN-2347-856X, ISSN-2348-0653).
2. Arul Jothi C and Mohmadraj Gaffoor A (2017), "Impact of Social Media in Online Shopping" School of Management Studies, Bannari Amman Institute of Technology, India, Volume 3, Issue 3, Paper 6[576-586].
3. Jaimin Kamleshbhai Patel (2018), "Study of Consumer Perception on Online Shopping" Online Journal of Multidisciplinary Subjects, (ISSN: 2349-266X), Volume 12, Issues 3.
4. Neha Gupta and Deepali Bhatnagar (2017), "A Study on Online Shopping Behavior among the Students" Journal of Business and Management, Volume 19,Issue 6,Ver. V,PP 01-07, e-ISSN:2278-487X, P-ISSN:2319-7668.
5. Madasu Bhaskara Rao, Ch Lakshmi Hymavathi and M Mallika Rao (2018), "Factors Affecting Female Consumers Online Buying Behavior" journal of Academy of Marketing Studies, Volume 22, Issue 2.
6. Rahul Kumar (2016), "The Future of Online Shopping in India" International Journal of Advanced Research, Volume 4, Issue 5, (1528-1544), [ISSN: 2320-5407].

IMPACT OF SUNSPOTS ON EARTHQUAKES

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ABSTRACT

Earthquakes are the sudden shaking of earth and movement of the earth's crust caused by the release of seismic energy in the form of seismic waves. They are short-lived, menacing and the most feared natural hazards because of their unforeseen impact and devastation in a matter of few seconds inflicting immense losses of life and property. Sun-Earth interrelations are complex involving many phenomena such as solar wind, ionosphere interaction, solar magnetism, solar emissions, etc. The influence of solar activity on earth seismicity is a major field of interest in the last three decades, connected with the long-term prediction of earthquakes. Solar cycles play a significant, but not an exclusive role in triggering of earthquakes. Many studies revealed that the span of solar activity and its cycle has an increasing effect on the seismic activity in the tension zones of the earth, at the same time, also has a reduction in seismic activity on the constricting zone of the earth. The correlation between sunspots and the occurrence of earthquakes are discussed in detail and an attempt to establish their link is made by doing graphical analysis taking into consideration the historical earthquakes occurred that have magnitude greater than 8 in Richter scale.

INTRODUCTION

Sun, the central star of the solar system, is almost a spherical ball of hot plasma, mainly composed of hydrogen, helium and smaller quantities of other elements like oxygen, neon, carbon and iron. Though the Sun is 149 million kilometres, the unceasing solar activities assures an impact on our planet Earth both directly and indirectly. The motive of the research article is to study the association of solar activities [mainly sunspots] in contingency of earthquakes. An earthquake, also called as a quake, tremor or temblor, is the shaking of the surface of the Earth resulting from a unexpected release of energy in the Earth's lithosphere that creates seismic waves. Earthquakes can range in size from those that are so weak that they cannot be felt to those violent enough topropel objects and people into the air, and wreak destruction across entire cities. Seismic waves are produced when some form of energy stored in Earth's crust is released at once, usually when masses of rock straining against one another gets fractured and "slip." The tectonic processes and geo-structural attributes like faults and lineaments are the important geological imminent for happening of the earthquakes. The solar cycle is an oscillatory process excited by the movement of the major gas planets around the barycentre of the solar system. The Sun is in its 25^{th} solar cycle. Every 11 years, the Sun's magnetic field completely flips. This means that the Sun's north and south poles switch places. Then it takes about another 11 years for the Sun's north and south poles to flip back again. The solar cycle affects the activity on the surface of the Sun, as the magnetic fields change, so does the amount of activity on the Sun's surface. One way to track the solar cycle is by counting the number of sunspots. The beginning of a solar cycle is a solar minimum, or when the Sun has the least sunspots. Over time, solar activity, and the number of sunspots, increases. The middle of the solar cycle is the solar maximum, or when the Sun has the most sunspots. As the cycle ends, it fades back to the solar minimum and then a new cycle begins. Some cycles have maximums with lots of sunspots and activity. Other cycles can have very few sunspots and little activity.

Sunspot Number and Formula

The sunspot number time series is the only direct record at our disposal to retrace the long-term evolution of the solar cycle and of the probable long-term influence of the Sun on the Earth environment. The Sunspot number for any given day is not simply a count of the number of visible sunspots. The sunspot number, as defined by R. Wolf, is calculated using the simple equation:

$$\mathbf{R = (10*G + S) * K}$$

Where, R = the sunspot number; G = the number of sunspot groups observed; S = the count of all sunspots in all groups; K = a scaling co-efficient to compensate for variables. So, in the end, to calculate the sunspot number, we should count the number of sunspot groups and multiply that number by 10. Then, the result is added to the number of individual sunspots in all groups, and finally that result is multiplied by K. Since this was discovered by Wolf, it is also called Wolf number.

Sunspot Number and Earthquake Relationship

The association between solar activity and strong earthquakes on a global scale has been hypothesized since the second half of the last Century and, on and off, resumed over the years by several authors (Simpson, 1967; Zhang, 1998; Han et al., 2004; Choi and Maslov, 2010). The electrically charged particles emitted from the Sun propagate through the heliosphere along the interplanetary magnetic field (IMF) reaching the planets of the solar system. When the solar wind reaches the Earth, it determines geomagnetic disruptions which interact with the Earth's magnetic field and with the ionosphere. The geomagnetic disruptions, which determine variations measurable with the use of electromagnetic sensors placed on the Earth's surface, have been associated with seismic events of high intensity ($Mw \geq 6$) since the 1930's (Yanben et al., 2004).

In 1990, Takayama and Suzuki (1990) associated the Wolf number, i.e., the sunspot number, with destructive earthquakes occurred in Japan, while in 1967 Simpson suggested as a possible seismogenic mechanism the faradic current which is present in the Earth crust and produced by the solar activity. A few years later, in 2004, Han et al. found that large earthquakes were related to variations in the magnetic cycle of the solar activity. Mazzarella et al. (1988) concluded that the seismicity is related to solar activity and geomagnetic anomalies: they suggested that these two phenomena were capable of generating high intensity seismic events. A similar concept contemplating the effect of solar flares and magnetic storms was reasserted by Balasis et al. (2010). In 2011, Tavares and Azevedo suggested that an increase in solar activity coincides with an intensification of seismic events, while a study by the Space Environment Research Centre of Kyushu University (Juuso and Yumoto, 2011) revealed that 70% of great earthquakes (Mw 6-9) occurred within ±4 days, i.e., 4 days before or 4 days after, the arrival of the high-speed solar wind. Variations in the solar electromagnetic radiation have been observed preceding great earthquakes, such as the one in Tohoku (He et al., 2012). A possible connection between solar and geomagnetic activity on a century-scale and an interaction mechanism between the two phenomena were proposed by Odintsov et al. (2006), while Straser and Cataldi (2014) recently suggested an interface mechanism of the solar and the geomagnetic activity as a triggering mechanism of strong earthquakes.

Han Yanben, Zeng Jian, Jinbing and Lihua studied the relationship between big earthquakes (Ms ≥ 8) and solar activity that occurred in China and western Mongolia. They discovered that the occurrence dates of most of the big earthquakes in and near faults with west-east strike are close to the maximum years of sunspot numbers. According to their paper, the appearance of many magnetic storms in years of maximum solar activity is the cause an increased number of earthquakes. Magnetic storms would result in anomalies of geomagnetic field and in eddy current in the faults, producing earthquakes with near west east strike. They supposed that initiation of an earthquake occurs easily since the eddy currents heat the rocks in the faults and therefore decrease the shear resistance and the static friction limit of the rock. Sobolev et al. and Zolotov et al. were interested in the same subject. They investigated a relationship between solar wind, particle radiation and earthquakes. Earthquakes have in homogeneous distribution on the Earth's surface. The shallow earthquakes happen in areas that are transform or divergent tectonic boundaries. Convergent tectonic boundaries have intermediate, deep and huge earthquakes. There are several parameters such as tectonics, magnitude, depth, and the heterogeneity in the Earth's crust for each plate etc., involved to determine the relationship between solar activity and earthquakes.

Major Earthquakes and their Sunspot Graphs

Graphs are plotted taking into account 10 major historical earthquakes across the globe that are of magnitude above 8 in Richter scale of measurement. The sunspot number data, collected from the SILSO (Sunspot Index and Long-term Solar Observations) website (http://www.sidc.be/silso/datafiles). The list of earthquakes considered for graphical analysis is: Chile (22/05/1960) having corresponding sunspot number as 167; Alaska (27/03/1964) with sunspot number 24; Northern Sumatra (26/12/2004) having sunspot number 16; Japan (11/03/2011) with sunspot number 83; Kamchatka (04/11/1952) having corresponding sunspot number as 0; Chile (27/02/2010) with sunspot number as 14; Alaska (04/02/1965) with sunspot number as 19; Assam Tibet (15/08/1950) having sunspot number as 113; Northern Sumatra (28/03/2005) with sunspot number 16; Northern Sumatra (11/04/2010) having corresponding sunspot number as 30. All the 10 earthquakes were graphically analysed but only the graphs of three earthquakes and corresponding sunspot number for the whole month are shown as an example.

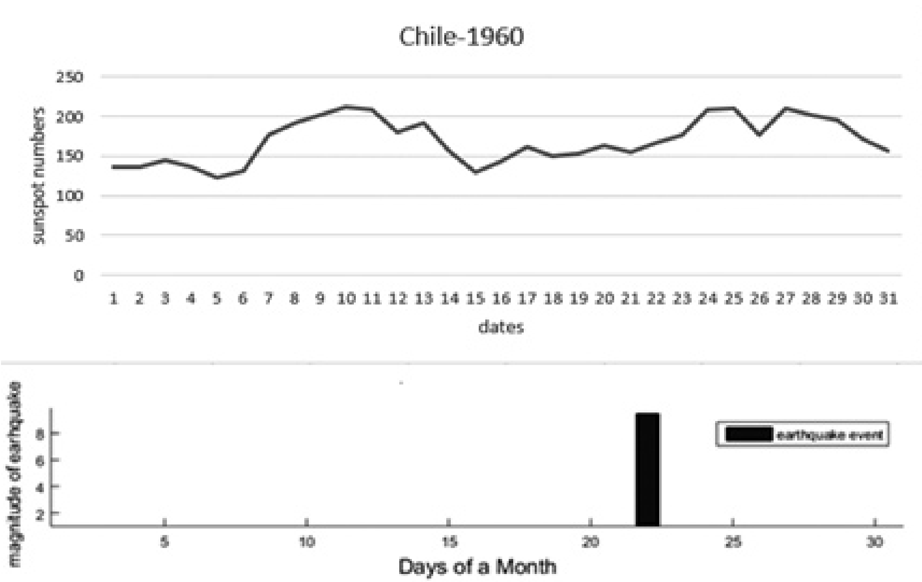

Figure 1: The graph depicts the sunspot number to be 167 during the Chile 1960 earthquake of magnitude 9.5

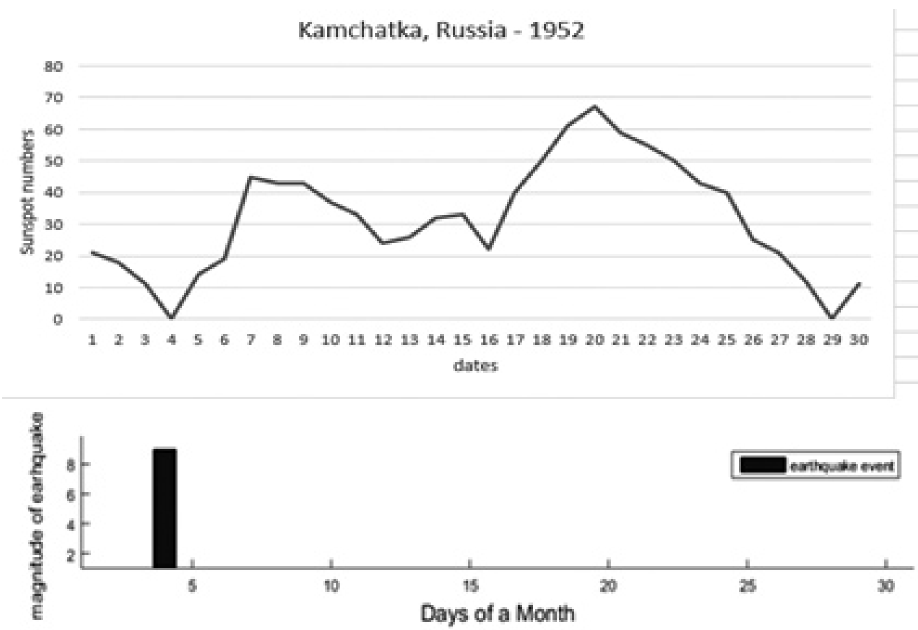

Figure 2: The above graph depicts that the sunspot number was 0 during the Kamchatka, Russia – 1952 earthquake which had a magnitude of 9.0

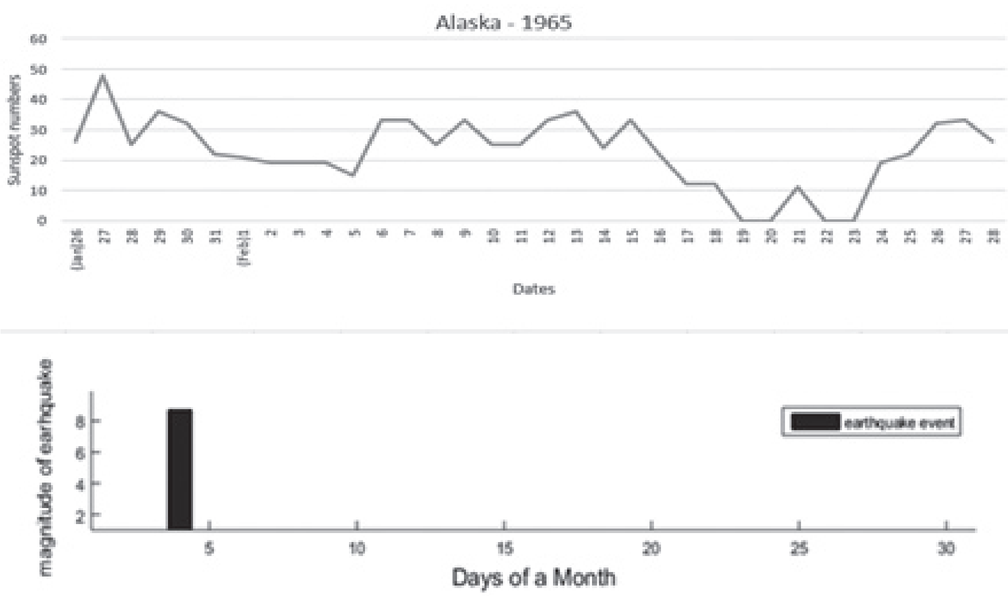

Figure 3: This graph represents the sunspot number to be 19 during the Alaska 1965 earthquake of magnitude 8.7

Consolidated Tabular Column

Given below are the consolidated tabular columns of the analysed data. The first tabular column (Table 1) conveys that only some earthquakes have high sunspot value in the day of its occurrence. The second table (Table 2) gives the data of the number of sunspots observed during the consecutive previous 5 days from the date of the earthquake occurred. This data shows that there had been a gradual increase in sunspot numbers (not in all the cases) few days before the earthquake incident.

S.No.	Place	DD/MM/YYYY	Magnitude	Sunspot number
1	Chile	22-05-1960	9.5	167
2	Alaska	27-03-1964	9.2	24
3	Northern Sumatra	26-12-2004	9.1	16
4	Japan	11-03-2011	9	83
5	Kamchatka	04-11-1952	9	0
6	Chile	27-02-2010	8.8	14
7	Alaska	04-02-1965	8.7	19
8	Assam Tibet	15-08-1950	8.6	113
9	Northen Sumatra	28-03-2005	8.6	16
10	Northern Sumatra	11-04-2010	8.6	30

Table 1: This tabular column gives the consolidated data of sunspot number during the 10 earthquakes taken into account

S. No.	Place	Date	Magni tude	Average Sunspot no. for the month	Sunspot number on the day of earthquake	previous day 1 sunspot number	previous day 2 sunspot number	previous day 3 sunspot number	previous day 4 sunspot number	previous day 5 sunspot number
1.	Chile	22.05.1960	9.5	169.323	167	154	163	153	150	161
2.	Alaska	27.03.1964	9.2	24	24	29	33	39	43	45
3.	Northern Sumatra	26.12.2004	9.1	28.935	16	19	36	29	42	24
4.	Japan	11.03.2011	9	78.645	83	83	113	141	138	130
5.	Kamchatka	04.11.1952	9	33.033	0	37	45	47	48	57
6.	Chile	27.02.2010	8.8	28.5	14	26	29	30	15	17
7.	Alaska	04.02.1965	8.7	23.203	19	22	32	36	25	48
8.	Assam Tibet	15.08.1950	8.6	120.645	113	96	119	105	99	106
9.	Northern Sumatra	28.03.2005	8.6	39.645	16	36	42	55	66	52
10.	Northern Sumatra	11.04.2010	8.6	85.9	30	16	14	25	30	53

Table 2: The second tabular column gives the sunspot number of the consecutive previous 5 days from the day of occurrence of major Earthquakes.

Observation

Sunspot numbers corresponding to the month of occurrence of the earthquake and the earthquake's magnitude where plotted into graph to study the relationship between them. Some earthquakes had large sunspot number and other earthquakes even had sunspot number as zero during the date of earthquake. Fluctuations where observed in the analysis.

These data convey that only some earthquakes have high sunspot numbers during the day of its occurrence. For example, the chile 1960 quake had sunspot count as 167 on May 22nd. But Kamchatka, Russia earthquake which occurred on April 11th 1952 had 0 Sun spots on that day.

Tracing the sunspot numbers of the previous five days from the occurrence of earthquake, a pattern of increase in sunspot number is observed. This observation is not applicable to all the cases where as Kamchatka 1952 earthquake and Alaska 1965 earthquake can be set as an example for this.

Conclusion and Future works

From the analysis of the historical data, we can confirm that there is a significant relationship between sunspot numbers and the corresponding earthquakes occurred. This does not mean that the earthquakes can be predicted earlier only by taking into account the sunspot numbers, but the triggering of earthquakes surely occurs due to the gradual increase in sunspot numbers. Many other relevant parameters also contribute to the kick out of earthquakes by causing impact on the physical environment. Hence, this research work claims that statistical evaluation can be done for sunspot numbers versus earthquake phenomenon for different range of values so that we can have an extended research in predicting earthquakes. This ideology may be taken as a hypothesis to trigger or predict the earthquakes using solar-terrestrial interactions. The magnitude of earthquakes and increasing values of sunspot numbers on the days before earthquakes (in some cases) reveals that there is a noteworthy impact on the happening of earthquakes, but cannot solely be responsible for it as there are fluctuations noticed in the analysis. As per the data, not all the earthquakes occur with gradual increase of sunspots, rather some of the historical earthquakes may be related with it. The increase in sunspot numbers accounts for the increase in magnetic activity of the sun, which further has an impact on earth's magnetism and its seismic activity, thereby acting as a precursor for earthquakes.

A cumulative study of various other factors such as geomagnetic index of earth, rooting earthquakes along with the analysis of sunspot number pattern can pave way to the prediction of earthquakes which is still uncertain. Thus, the research showcases that considerable relationship exists between the sunspot count and earthquakes.

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REFERENCES

1. “Life of the stars-The sun” by Dr Helen Johnston October 2016, University of Sydney.
2. “Genesis of Solar Flares and Associated Phenomena” by Rajmal Jain, Physical Research Laboratory, Navrangpura, Ahmedabad – 380 009, India.
3. “Preventing Earthquake disaster” – book by Network of Earthquake Engineering Simulation.
4. Influences of solar cycles on earthquakes Marilia Tavares, Anibal Azevedo.
5. A reappraisal of earthquake focal mechanisms and active shortening in the Zagros mountains of Iran – Morteza Talebian and James Jackson.
6. Structure of the Earth Archived 2013-03-15 at the Wayback Machine. Scign.jpl.nasa.gov. Retrieved on 2012-01-27.

7. ON THE GENESIS OF THE EARTH'S MAGNETISM, edited by Paul H Boberts and Eric M King, published 4 September 2013.
8. "Variations in earthquake size distribution across different stress regimes" – Danijel Schoelemmer, Stefan Wiemer, Max Wyss.
9. "Power spectra analysis for worldwide and North Africa historical earthquakes data in relation to sunspots periodicities" – M.A.M. Shaltout, M.T.Y Tadros, S.L. Mesiha – 09 September 1998.
10. Revisiting the Sunspot Number - Frédéric Clette, Leif Svalgaard, José M. Vaquero, Edward W. Cliver.
11. M. K. Das Gupta and 1). Basu, Solar-terrestrial events in relation to the phase of the solar cycle, J. Atmosph. Terr. Phys. 27 (1965) 1029.
12. SILSO (Sunspot Index and Long-term Solar Observations) website .
13. Correlation of global earthquake rates with temperature and sunspot cycle- Rajesh Rekapalli1 and R.K. Tiwari

WEBSITES

1. https://www.enchantedlearning.com/subjects/astronomy/sun/prominences.shtml.
2. http://www.sidc.be/silso/datafiles

PREDICTION OF PRODUCT DELIVERY OF AN E-COMMERCE COMPANY USING CLASSIFICATION TECHNIQUE

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ABSTRACT

The aim of this study is to build a classification model to predict whether a product ordered by a customer on an e-commerce digital platform would get delivered on time and to measure customer's performance. The dataset was obtained from an e-commerce company who wanted to test their company's performance. The sample size of the dataset is 10999 records consisting of 12 variables. The entire dataset is split into 80% for training the model and 20% for testing the performance of the model.

The scope of the study is to compare the three popular machine learning models namely logistic regression, Random Forest and Gradient Boosting. The machine learning models were coded using python and among that the best performing model is chosen for final predictions and is deployed using Flask frame work.

The classification algorithm analysis based on accuracy, precision and recall, the best performing algorithm for the e-commerce dataset is considered to be gradient boosting. Logistic regression and Random Forest provide the less accuracy with 63.13% and 68.1% whereas Gradient boosting provides higher accuracy with 68.7%.

Keywords: *Online shopping, E-commerce, Gradient boosting, Random Forest, Logistic regression.*

INTRODUCTION

The online shopping is the internet based modern business used by people across world with the help of technology. The World Wide Web internet service used as an easy solution to advertise and make customers to purchase apparels, goods, foods, electronic items or accessories. Initially the online shopping was done based on cash on delivery as the only mode of payment. Later, digitalisation played a major role in e-commerce business, online shopping had a massive change in transaction processing, good delivery, fast tracking process and customer satisfaction were considered as most key factors.

The customers were moved from traditional shopping by going to physical store and increased digital shopping which became more convenient shopping for the users or buyers. This also helps to build the economic levels and increased small scale retail business with low investments and less administrative. On the other side, the buyers saves time in online shopping and able to compare multiple products in single platform by viewing their e-manuals, images, multi videos etc. Towards prices, features, models, brands, convenience is reviewed by customers in an easy manner.

In twenty first century, both trade and commerce becomes more diversified in multi channel throughout the world. The technology professional stills experimenting new ways of shopping, securing the payments, stopping digital frauds and trying overall customer satisfaction which led to popularity and growth to online shopping. The present Study analyses the recent trend of purchasing items are all based on E-Commerce platforms. Many E-Commerce platforms are emerging day by day which brings customer experience and shortfalls with customer disappointment which motivated me to study and analyze the data such as product sales and on-time delivery, customer satisfaction, of an E-Commerce company.

Literature Review

Previous studies based on consumer characteristics includes demographic, social characteristics etc and perceived risk factors like privacy, security, delivery & return, payment. Financial and quality risk was reviewed.

Limayem and Khalifa (2000) emphasized in their paper that an online shopping is completely different from a traditional shopping and different factors plays a vital role to determine the online consumer behaviour.

Belanger and Carter (2005), Cheung Health Risk and Lee (2000), Corritore et al. (2005), and Jarvenpaa and Tractinsky (1999) studied perceived the risk related to part of a trust construct in online shopping since both user/buyer/seller known virtually.

A gender difference also has different perception and attitudes towards online shopping. Although men are more positive in Internet usage but the online shopping done at medium and frequency is low. Rather female shoppers prefer to shop online, do it more frequently than male (Burke, 2002; Li et al., 1999).

Yulihasri, Islam and Daud (2011) conducted a study on ‘Factors that Influence Customer’s Buying Intention on Shopping Online’. They applied Pearson correlation analysis provided statistical information about the relationship of each independent variable with dependent variables. It was studied that web advertising favourably influences the purchasing of a company’s products and user compares more products in virtual platform.

Karim (2013) conducted a study on online shopping behaviour of customers and Sellers. They documented online vendors can assure their consumers for transaction security and avoid long delays in completing online orders/deliveries/timely dispatches/collection of return goods/refunds &payment settlements and the hassle of these perceived risk factors were worked by vendors for better online shopping experience.

It is evident that the frequency of shopping is increasing when they become more experienced in online shopping. This confirms the study of Heijden et al. (2003), Chen and Barnes (2007), Zuroni and Goh (2012), Jarvenpaa et al. (1997) and Hoque et al. (2015), where they found increasing size of buyer's behaviour with more demand by youth and change in market strategy.

Statement of the Problem

An E-Commerce company wants to know if their products are getting delivered on- time or not. They want to apply an appropriate machine learning algorithm to predict if the product would be delivered on time and also find the possible reasons on why the products are not reaching the customers on - time.

Objective

- To determine the best out of the classifiers based on their accuracy.
- To predict the on-time delivery of the product using a classification model.

Data Description: E-Commerce Data

The dataset was obtained from an e-commerce company wanted to test their company's performance. This study is a classification problem that aims to predict the product delivery using other product features.

- **Sample size:** 10999
- **Source:** Secondary data
- **Attributes:** 12

Tools and Techniques

- Percentage analysis
- Logistic Regression
- Random forest
- Gradient Boosting

Figure 1: Factors Leading to Product Not Getting Delivered

The above figure shows the outlook to understand the reason for delayed product delivery.

Table 1: Categorisation of Variables in the Analysis

S.NO	ATTRIBUTES	DESCRIPTION	DATA TYPE
1	Id	Id number of the customer	Numeric
2	Warehouse_block	The company has a big warehouse which is divided in various blocks such as A, B, C, D and so on.	Categorical
3	Mode_of_Shipment	The company ships the products by different modes of transport such as ship, air and road	Categorical
4	Customer_care_calls	This variable indicates the number of calls made for enquiry of the shipment. (Sometimes customer make too many calls, hence the company wants to know that are these customers unknowingly favoured.	Numeric
5	Customer_rating	The company has rated every customer on various parameters, 1 being the lowest (Worst), 5 being highest (Best)	Ordinal
6	Cost_of_the_Product	It is the cost of the product in USD	Numeric
7	Prior_purchases	This variable indicates the number of prior purchases	Numeric
8	Product_importance	The company has categorised the products in the range of high, medium and low based on various parameters	Categorical
9	Gender	Male or female	Categorical
10	Discount_offered	it is the percentage of discount offered on that specific product.	Numeric
11	Weight_in_ gms	It is the weight in grams	Numeric
12	Reached. on.Time_Y.N	It is the Y variable, where 1 Indicates that the product has NOT reached on time and 0 indicates it has reached on time	Categorical

Findings

Descriptive Statistics

	Customer_care_calls	Customer_rating	Cost_of_the_Product	Prior_purchases	Discount_offered	Weight_in_gms
count	10999.000000	10999.000000	10999.000000	10999.000000	10999.000000	10999.000000
mean	4.054459	2.990545	210.196836	3.567597	13.373216	3634.016729
std	1.141490	1.413603	48.063272	1.522860	16.205527	1635.377251
min	2.000000	1.000000	96.000000	2.000000	1.000000	1001.000000
25%	3.000000	2.000000	169.000000	3.000000	4.000000	1839.500000
50%	4.000000	3.000000	214.000000	3.000000	7.000000	4149.000000
75%	5.000000	4.000000	251.000000	4.000000	10.000000	5050.000000
max	7.000000	5.000000	310.000000	10.000000	65.000000	7846.000000

Table 2: Customer Care Performance

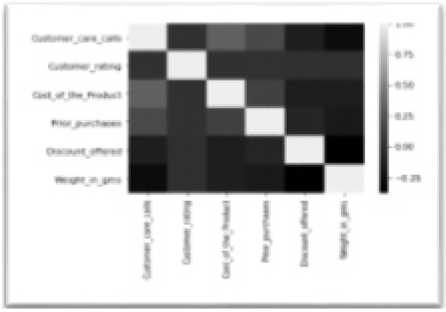

Figure 2: Confusion Matrix

The above table gives mean and standard deviation for all customer care performance data. Figures 2 show the correlation between various independent variables. All the independent variables are not highly correlated among each other; hence there exists no multicollinearity.

Data Visualization

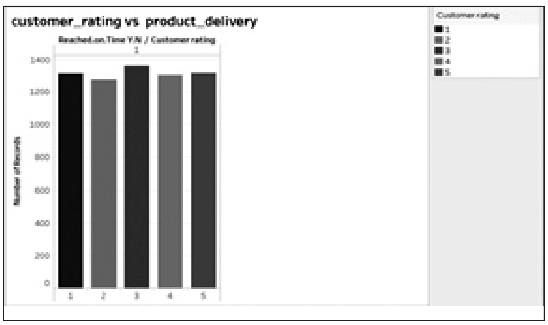

Figure 3
(customer_rating vs product_delivery)

Figure 4
(prior_purchases vs product_delivery)

Figure 3 and 4 shows the delivery of customers based on customer rating and it is clearly visible that there is no difference in the product delivery and customer rating. The above plot shows the product delivery based on prior purchases of the customer. It is seen that as the number of prior purchases increases, the delay in product delivery reduces.

Tabulation

Warehouse block	% not delevired
A	16.4
B	16.9
D	16.7
E	16.7
F	33.4

Mode of shipment	% not delivered
Flight	16.4
Road	15.7
Ship	67.9

Product importance	% not delivered
Low	48.3
Medium	42.6
High	9.1

Table 3: Warehouse block, Mode of Shipment, product importance vs % not delivered

Table 3 shows the percentage of product not delivered based upon the Warehouse block, Mode of shipment and product importance. A product with Warehouse F, low importance and mode of vehicle via ship is not reaching the customers on time.

Prior Purchases	% not delevired
2	25.2
3	39.2
4	18.1
5	9.9
6	4.9
7	1.4
8	1.3

Customer care calls	% not delevired
2	6.4
3	30.5
4	32.3
5	20.9
6	8
7	2

Table 4: Prior Purchases & product importance vs % not delivered

Table 4 shows the percentage of product not delivered based upon the prior purchases of customers and the customer care calls. We find that customers with less prior purchases and making less call are not receiving the product on time.

Modelling Results

- Training data: 80%
- Testing Data: 20%

Logistic Regression

The Logistic regression model is built using the training data to predict the on-time delivery of the product. The following metrics were used to evaluate the model.

- **Accuracy** 63.7%

Cross-Validation

The developed model is cross validated by dividing the dataset into k=10 groups and the model is run on each of the divided group. The accuracy for the 10 groups is given below.

Scores: [0.65, 0.63, 0.62, 0.61, 0.62, 0.62, 0.63, 0.63, 0.64, 0.62]

Mean_accuracy: 0.63

Standard Deviation: 0.01

	precision	recall	f1-score	support
delivered	0.56	0.46	0.51	893
not_delivered	0.67	0.75	0.70	1272
accuracy			0.63	2165
macro avg	0.61	0.61	0.61	2165
weighted avg	0.62	0.63	0.62	2165

Table 5: Classification Report

From the above classification report we can infer that the precision of "delivered" class is 56% and "not-delivered" class is 67%. The recall of "delivered" class is 46% and "not-delivered" class is 75%.m. The overall f1 score of the logistic regression model is 0.63.

Random Forest

The Random Forest model is built using the training data to predict the on-time delivery of the product. The following metrics were used to evaluate the model.

- **Accuracy:** 68.1%
- **Hyper Parameters:** max_depth=3, n_estimators=1000, min_samples_leaf=10, max_features=10

Cross-Validation

The developed model is cross validated by dividing the dataset into k=10 groups and the model is run on each of the divided group. The accuracy for the 10 groups is given below.

- Scores: [0.68, 0.67, 0.68, 0.68, 0.68, 0.69, 0.66, 0.66, 0.69, 0.69]
- Mean: 0.68
- Standard Deviation: 0.01

	precision	recall	f1-score	support
delivered	0.57	0.94	0.71	893
not_delivered	0.92	0.50	0.65	1272
accuracy			0.68	2165
macro avg	0.74	0.72	0.68	2165
weighted avg	0.77	0.68	0.67	2165

Table 6: Classification Report

From the above classification report we can infer that the precision of "delivered" class is 57% and "not-delivered" class is 92%. The recall of "delivered" class is 94% and "not-delivered" class is 50%. The overall f1 score of the Random Forest model is 0.68.

Gradient Boosting

The Gradient Boosting model is built using the training data to predict the on-time delivery of the product. The following metrics were used to evaluate the model.

- **Accuracy:** 68.7%
- **Hyper Parameters**: n_estimators=200, max_depth=5, learning_rate=0.01

Cross-Validation

The developed model is cross validated by dividing the dataset into k=10 groups and the model is run on each of the divided group. The accuracy for the 10 groups is given below.

- Scores: [0.66, 0.66, 0.68, 0.67, 0.69, 0.69, 0.67, 0.68, 0.68, 0.69]
- Mean_accuracy: 0.68
- Standard Deviation: 0.01

	precision	recall	f1-score	support
0	0.58	0.92	0.71	893
1	0.90	0.52	0.66	1272
accuracy			0.69	2165
macro avg	0.74	0.72	0.69	2165
weighted avg	0.77	0.69	0.68	2165

Table 7: Classification Report

From the above classification report we can infer that the precision of "delivered" class is 58% and "not-delivered" class is 90%. The recall of "delivered" class is 92% and "not-delivered" class is 52%. The overall f1 score of the Gradient Boosting model is 0.69.

MODEL	ACCURACY
Logistic regression	63.70%
Random Forest	68.10%
Gradient Boosting	**68.70%**

Table 8: Predictive Models

The above table provides the model accuracy for the three machine learning models namely, Logistic Regression, Random Forest and Gradient Boosting. On comparing the above model accuracy, we find that Gradient Boosting performs better with accuracy 68.7% when compared to the other 2 models.

Model Deployment

The machine learning model has been deployed using flask in python. Flask is a micro web frame work written in python. The model deployment makes it easier for a non-statistician to understand the working flow of the developed machine learning model.

Figure 5: Product Delivery Customer form

The above figure depicts the web page created for model deployment. Entering the values of the dataset features will predict if the product will reach the customer on time or not.

FINDINGS AND CONCLUSION

The main objective of this project was to compare the performance of the three popular machine learning models namely, Logistic regression, Random Forest and Gradient boosting. The dataset was divided into 80% for training and 20% for testing.

Logistic Regression had the lowest performance with accuracy 63.7% accuracy. A 10-fold cross-validation was performed on the trained model to evaluate the model accuracy. The average mean accuracy was found to be 63% and standard deviation 0.01. A classification report was used to determine the performance of classification of the model. The precision of "delivered" class is 56% and "not-delivered" class is 67%. The recall of "delivered" class is 46% and "not-delivered" class is 75%.

Random Forest performed slightly better than the logistic regression. The following hyper parameters were used to train the model: max_depth=3, n_estimators=1000, min_samples_leaf=10, max_features=10. 1000 trees were used to train the model involving 10 features. A 10-fold cross-validation was performed on the trained model to evaluate the model accuracy. The average mean accuracy was found to be 68% and standard deviation 0.01. A classification report was used to determine the performance of classification of the model. The precision of "delivered" class is 57% and "not-delivered" class is 92%. The recall of "delivered" class is 94% and "not-delivered" class is 50%.

Gradient boosting performed the best among the three machine learning models. The following hyper parameters were used to train the model: n_estimators=200, max_depth=5, learning_rate=0.01. The model was built using 200 trees with 5 levels of branches at 0.01 learning rate. As per the classification report, the precision of "delivered" class is 58% and "not-delivered" class is 90%. The recall of "delivered" class is 92% and "not-delivered" class is 52%.

The performance of the three popular data mining models were analysed based on various statistical measures. Classification using different data mining algorithm were implemented, evaluated and compared. A classification report based on confusion matrix was used for classifier performance analysis. The classification algorithm analyses are based on accuracy, precision and recall. The paper found that the best performing model for the e-commerce dataset is Gradient Boosting.

REFERENCES

1. Fabien Szabo de Edelenyi, Louisa Goumidi, Sandrine Bertrais, Catherine Phillips, Ross MacManus, Helen Roche, Richard Planells & Denis Lairon , 2008. Prediction of the metabolic syndrome status ,Genes & Nutrition volume 3, pages173–176.
2. Elizabeth J Atkinson ,Terry M Therneau, L Joseph Melton III, Jon J Camp, Sara J Achenbach ,Shreyasee Amin, Sundeep Khosla (2012), Assessing fracture risk using gradient boosting machine (GBM) models.
3. Mohammed Khalilia, Sounak Chakraborty & Mihail Popescu, BMC Medical Informatics and Decision Making (2011), Predicting disease risks from highly imbalanced data using random forest volume 11, Article number: 51
4. Cheema & Abbas, Logistic regression model by using Pakistan Social and Living Standard Measurement (PSLM) survey data 2010-11.
5. Travis Woolley A,B, David C. Shaw A, Lisa M. Ganio A and Stephen Fitzgerald A, International Journal of Wildland Fire 2012, A review of logistic regression models used to predict post-fire tree mortality of western North American conifers, 21, 1–35.
6. Limayem, M., Khalifa, M., Frini, A., 2000. What Makes Consumers Buy from Internet? A Longitudinal Study of Online Shopping. 421-432.
7. Yulihasri, Islam and Daud (2011) 'Factors that Influence Customer's Buying Intention on Shopping Online, research Gate, Volume 3,128-139.
8. Javernpaa, S.L., Tractinsky, N., & Vitale, M. (2000). Consumer trust in an internet store. Infomation Technology and Management, 1, 45-71.

WEBSITES

1. https://asbmr.onlinelibrary.wiley.com/doi/full/10.1002/jbmr.1577.
2. https://ieeexplore.ieee.org/abstract/document/8007210/authors#authors.
3. https://genesandnutrition.biomedcentral.com/articles/10.1007/s12263-008-0097-y.
4. https://bmcmedinformdecismak.biomedcentral.com/articles/10.1186/1472-6947-11-51.
5. https://www.scribd.com/document/367716038/Literature-Review.
6. https://pdfs.semanticscholar.org/f48f/5b7ac93d7bb74a0146a74f4fa6c330738ddb.pdf.
7. https://medium.com/gradient-boosting-working-limitations-time/gradient-boosting-working-and-applications-28e8d4ba866d.
8. https://medium.com/fintechexplained/flask-host-your-python-machine-learning-model-on-web-b598151886d

A COMPARATIVE STUDY ON CUSTOMER PREFERENCE TOWARDS MAGGI AND YIPPEE NOODLES (WITH REFERENCE TO CHENNAI CITY)

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ABSTRACT

Maggi originated in Switzerland and was later acquired by the Swiss-owned Nestle', and began import to India in 1983. By the early 2000s, Maggi had found a frantic, loyal consumer base in Metropolitan India. From Delhi to Mumbai, outside train stations and office buildings, street vendors dish up ladleful of Maggi swimming in curry broth. In 2015, Maggi was also at the centre of a massive food safety scandal, during which the noodles allegedly tested positive for high lead content, and the Food Safety and Standards Authority of India issued a brief, nationwide ban on all Maggi products.

Sunfeast Yippee was born out of the need for better noodles. ITC entered the instant noodles segment with the launch of Sunfeast Yippee! in 2010. With the blending expertise of Aashirvaad Atta to create a round noodle block, a choice in masala and a special scientific process that does not allowing lumping, Sunfeast Yippee! is Number 2 instant noodles. Yippee invaded its growth in the market rapidly when Maggi was banned in India.

A product or brand establish them self in the market only when they are preferred or accepted by the consumers. A comparative study regarding the customer's preference towards these two brands was taken. Though Maggi was banned and Yippee rose up to its position during the crisis, Maggi is the leading brand among instant noodles followed by Yippee in the second position.

Keywords: *Customer, Customer Preference, Maggi, Yippee, Influential Factors.*

INTRODUCTION

A Customer is an individual or business who purchases a company's goods or services. Customers are important because they drive revenues and without them business have nothing to offer. Preference is a technical term used in relation to choosing between alternatives. Customer preferences are expectations, likes, dislikes, motivations, and inclinations that drive customer purchasing decisions. Instant noodles are a Japanese Noodles Dish, sold in a precooked and dried noodle block with flavouring powder/ or seasoning oil. Some examples of instant noodles are Maggi, Knorr, Foodles, Sunfeast Yippee. The research is based on the customer preference towards Maggi and Yippee Noodles with respect to Chennai City.

Literature Review

[1]**Srivastava, R. (2019),** in their study titled, "Rebuilding a global brand under crisis – case of a global brand Maggi", studied whether the controversy was because of the brand crisis based on quality had any impact on consumer brand equity, brand image, brand reliability, brand perception of quality, perceived value, brand sentiments and purchase behaviors. The study helped the brands in the future to know how a crisis can be managed efficiently by drawing a clue from the strategies implemented by Maggi.

[2]**Jiumpanyarach, W. (2018),** in their study titled, "The impact of social trends: teenagers' attitudes for organic food market in Thailand", studied that the teen consumers were likely to buy ready- to- cook organic food items instead of conventional food items because of health and food safety concerned under their budget constraints.

[3]**Dorota Rudawska, E. (2014),** in their study titled, "Customer loyalty towards traditional products – Polish market experience", state that the results of the research confirm positive and emotional attitudes of consumers towards traditional products. This emotional attachment is very important in creating loyalty among consumers and make them consume traditional products.

[4]**Mohan Kathuria, L. and Gill, P. (2013),** in their study titled, "Purchase of branded commodity food products: empirical evidence from India", studied with the aim of understanding brand awareness among consumers and analysing the attitude of consumers towards selected branded commodity food products. The study had made an attempt to examine the factors influencing and the purchase behaviour with respect to commodity products.

[5]**Ahmed, A., Ahmed, N. and Salman, A. (2005),** in their study titled, "Critical issues in packaged food business", examined the salient issues in the packaged food business with special focus on packaging and its crucial role covering food marketing, best practices in the food and drinks industry, product innovation, food safety and equality, food supply chain management and emerging trends.

Objectives

1. To identify the brand preference of the respondents.
2. To rank the factors influencing customer preference towards the products.
3. To analyse the customer inference of Maggi after the ban.

Research Methodology

A Research methodology involves specific techniques that are adopted in research process to collect, assemble and evaluate data. It defines those tools that are used to gather relevant information in a specific research study.

1. Period of study

The primary data required for the study was collected from November 2019 – February 2020 from both male and female respondents.

2. Data

Primary data was collected using Questionnaire and was properly coded, classified and tabulated using appropriate methods. Secondary data was collected from the information published through research articles and websites.

3. Sampling Design

A structured questionnaire was prepared and used to collect data from among 100 respondents using convenience sampling method.

4. Analytical tools

Various analytical tools like Percentage Analysis, Weighted Average method, Henry Garret Ranking method, Chi-Square test were adopted for statistical analysis.

Limitations of the Study

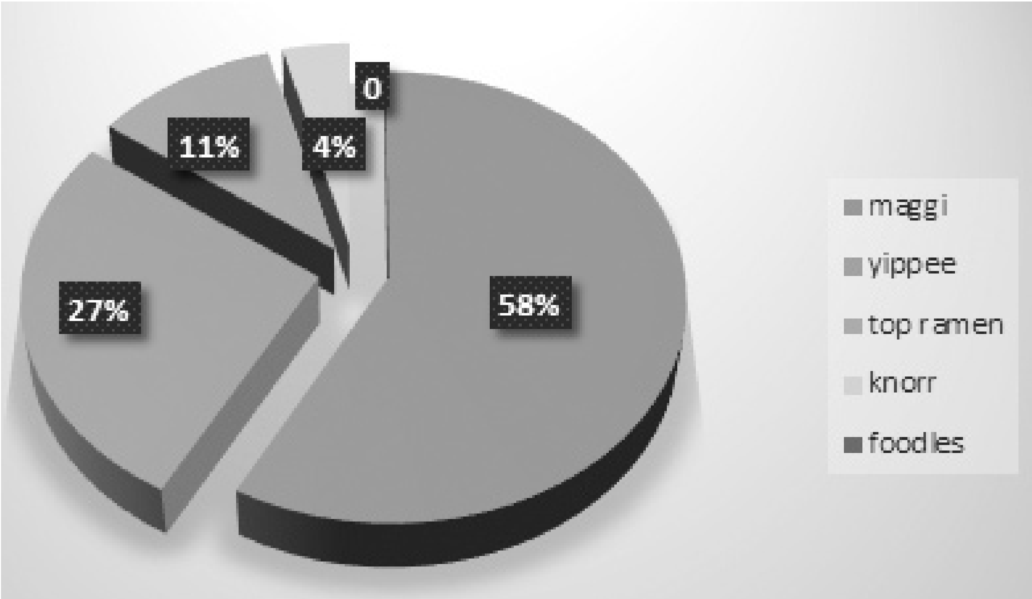
The study is restricted to a sample size of 100 respondents and was conducted in the city of Chennai and therefore the results may not be applicable to other areas. There remains a probability of biased judgements in the responses of the respondents.

Analysis

- Maggi was the most preferred brand with 58% followed by Yippee noodles with 27%. The other noodle brands included Knorr, Top Ramen and Foodles.

Table 1: Brand Preference of Respondents

	Number of Respondents	Percentage
MAGGI	58	58
YIPPEE	27	27
TOP RAMEN	11	11
KNORR	4	4
FOODLES	0	0
TOTAL	100	100



- The important factors that influence the customer preference are **brand image, price, taste, health, availability and advertisement.** With the help of Henry Garret Ranking Method the factors were ranked according to their importance. Taste was given the highest preference followed by health, availability, brand image, price and advertisement.

Table 2: Ranking of Factors in Henry Garret Method

FACTORS	1*82	2*70	3*63	4*58	TOTAL	AVERAGE	RANK
PRICE	2542	2870	1386	348	7146	71.46	**5**
TASTE	5740	1820	252	0	7812	78.12	**1**
HEALTH	5084	1470	819	232	7605	76.05	**2**
ADVERTISEMENT	1148	2240	1890	1392	6670	66.7	**6**
AVAILABILITY	3608	2870	882	58	7418	74.18	**3**
BRAND IMAGE	3362	2590	1008	348	7308	73.08	**4**

- With the help of weighted average method customer's opinion regarding the Maggi Noodles were obtained and tabulated. Most of the statements were agreed by the respondents except that the ban of the product had an effect on its brand image had a neutral response.

Table 3: Inference About Responses Given by Customers

STATEMENTS	WEIGHTED AVERAGE	INFERENCE
While Maggi was banned Yippee was ruling the market	3.75	AGREE
Promotional activities have helped Maggi increase its sales	4.14	AGREE
Yippee Noodles is the strongest competitor of Maggi	3.86	AGREE
After Ban of Maggi consumers had switched to other brands	3.49	AGREE
Maggi has lost its brand image after the ban	3.37	NEUTRAL

Other Major Findings

- 70% of respondents were female and remaining 30% were male.
- 37% of respondents belonged to the income group of Rs.10000 - 20000.
- 51% of respondents consumed Maggi as a snack and 27% preferred the same for dinner.
- 56.6% of respondents purchased instant noodles from nearby shops and 29.7% purchased it from super markets.
- 55.6% of respondents stated that Maggi was preferred more by age group of 10-20.

Suggestions

- More flavours and attractive offers can be introduced to attract customers.
- After the ban of Maggi Noodles people are afraid to consume the same. It would be great if Nestle' could take up the responsibility to inform consumers that it is safe to consume.
- Addition of vegetables can be made to the small packets of Maggi.
- The quality and quantity of both the products can be improved as well as their prices can also be made reasonable.
- Both the noodles can be a source of snack but it cannot be denied that they do not belong to the fast food category.

CONCLUSION

Maggi and Yippee are the most preferred brands of instant noodles. The customers preferred Maggi noodles when compared to Yippee due to various reasons. The brand image of Maggi was very strong when compared to Yippee Noodles. Though Maggi had to go through tough faces, the customers were quite happy with its comeback. They also wanted Nestle' to create awareness among the consumers that consumption of Maggi is not harmful for health. Yippee on the other hand had its own benefits. It is packed in the most attractive way when compared to Maggi.

When cooked it is long and non-sticky. At length Yippee can be seen as a better competitor of Maggi. Yippee invaded its growth in India but Maggi tops the market with a 70% share of market in India.

REFERENCES

1. Srivastava, R. (2019), "Rebuilding a global brand under crisis – case of a global brand Maggi", International Journal of Pharmaceutical and Healthcare Marketing, Vol. 13 No. 2, pp. 118-139.
2. Jiumpanyarach, W. (2018), "The impact of social trends: teenagers' attitudes for organic food market in Thailand", International Journal of Social Economics, Vol. 45 No. 4, pp. 682-699.
3. Dorota Rudawska, E. (2014), "Customer loyalty towards traditional products – Polish market experience", British Food Journal, Vol. 116 No. 11, pp. 1710-1725.
4. Mohan Kathuria, L. and Gill, P. (2013), "Purchase of branded commodity food products: empirical evidence from India", British Food Journal, Vol. 115 No. 9, pp. 1255-1280.
5. Ahmed, A., Ahmed, N. and Salman, A. (2005), "Critical issues in packaged food business", British Food Journal, Vol. 107 No. 10, pp. 760-780.

ELEVATE TO THE LAST FLOOR OF SPACE-SPACE ELEVATOR

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ABSTRACT

Space elevator is a new way of transportation system to space. It is a concept of elevating the payloads out of Earth's Gravity without using rockets. Without rockets means how it is possible? Space Elevator makes use of a tough cable which connects Earth and space. A climber with the payload will move away from Earth by breaking the Earth's gravity to the space of height 35,786 km altitude or above. The centrifugal force in the geostationary orbit will keep the space elevator upright. When the payloads reaching the orbits would released at orbital velocity to remain in orbits or released at increase velocity to enter into deep space or to nearby planets. It has an Earth port, Cable, Climber, Spacecraft.

Keywords: *Space Elevator, transportation system, geostationary orbit, centrifugal force, Cable, Earth Port, Climber.*

INTRODUCTION

A way to heaven – Space Elevator

Man's dream of climbing into heavens gave way to the idea to built Space Elevator. This idea of Space Elevator concept was proposed by Konstantin Tsiolkovsky in 1895, a Russian scientist. In the following years this concept was developed by Yuri Artsutanov, a group of American oceanographers led by John Isaac's, Jerome Pearson, and Clarke. Clarke's 'Fountain to paradise' article gets world's attention on space elevator. The Space Elevator consists of Earth port (anchor), cable, climber, spacecraft or space station [2].

Earth Port (Anchor)

Everything has a basement like that Space Elevator has a base (Earth port) on earth surface. Earth port is an Ocean-going platform at the equator as in the Fig.1 that supports the movement of the cable. It may be a refurbished oil platform in the ocean or a newly built platform in the equator, where there is no cyclonic storm, very few lightning, bad weather condition is much lesser in the equator. Anchor is not in the land or mountains tops, it is a mobile platform in ocean, which it has capable of adjust the cable in case of any bad weather or if the cable is in the path of Low Earth Orbit objects and storms or in the path of meteors or space debris, whereas location in land or mountain tops at equator are not able to move the cable during these situations [2][4].

Figure 1: Anchor Model

The anchor must have sufficient mass which not be affected greatly by the 20 ton capacity cable, sufficient power source and required place for power beaming system, ability to avoid collision and facilities for working crew.

Cable

The cable is the most important part of the space elevator which is the transportation path to the space. As the Space Elevator experience both Earth's atmosphere and the space, it must be able to withstand in numerous critical situation including severe weather, atmospheric radiation in Van Allen Belts and debris in space. Carbon Nanotubes have capability to withstand in these critical situations with specific design with epoxy composite [3].

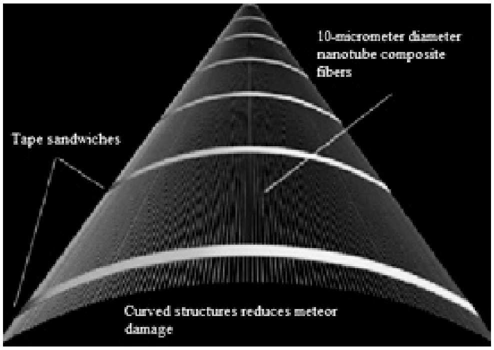


Figure 2: Cable

Carbon nanotubes are made up of several methods such as Arc discharge, laser ablation and chemical vapor deposition (CVD) methods. CVD method is most widely used, due to its advantages of low cost, controllable synthesis and high throughput [5]. The Carbon nanotubes would fabricated by CVD process, and the fabricated sheets are epoxy with one another to make a cable as shown in the Fig.2. The cable is curved shape with the design consists of diamond shaped with vertically aligned carbon nanotubes. The cable length is approximately 100,000 km at altitude and the cable is wider at Geo region. This is because the GEO region is the center of mass which holds the whole system [12].

Also there are two materials that could be grown with needed strength and length, are boron nitride nanotubes and single crystals, and continuous growth graphene [6].

Climber

Climber is the transportation tool to transport payloads from earth to space or from space to earth by going up and down through the cable. Fig.3 shows the climber model. It consists of track and roller system which gripes the cable, power system, control system and communication. There are Different types of climbers.

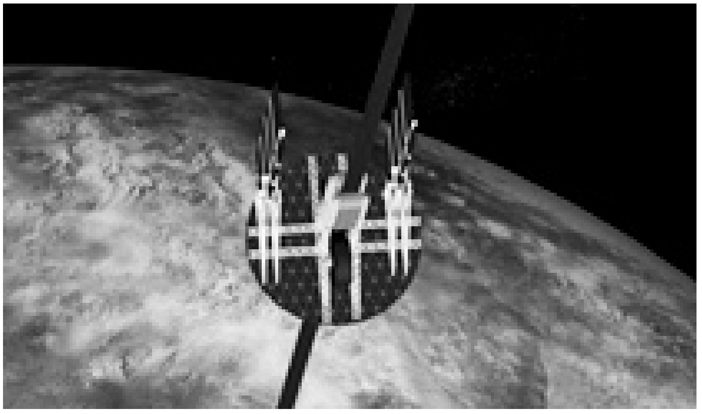


Figure 3: Climber

i) Initially climbers are use to widen and to strengthen the cable. This process is needed because the initially deployed cable is not have enough strength to carry the whole system, to strengthen the initial cable few hundreds of climbers with a 100,000 km length cable will sent up through the initial cable. As the climber climbs, it splices the new cable to the initial cable. ii) Repair climbers are needed if any malfunctioning happens in the climber. iii) Once the cable is ready for climb, payload (spacecraft, fuels etc.) or cargo climbers will be use [2].

SPACECRAFT (SPACE STATION)

This spacecraft is the initial part that deploys the initial cable at an altitude 100,000 km. Initial spacecraft (Fig.4) has,

Communication system: Sent the status of the cable and the spacecraft to the earth port.

Attitude control: It is to keep the spacecraft in the nadir orientation and deploys the cable in proper direction.

Power: Solar panel is used for power to command, attitude control and initial cable deployment.

Propulsion system: Hypergolic propellants (MMH/NTO fuels) are used in propulsion of the spacecraft to LEO, GEO and beyond GEO orbit [2].

Figure 4: Spacecraft

The construction of space elevator includes following steps.

First step: Launch of initial spacecraft to Low-Earth Orbit (LEO) by use of rockets as separate parts and then assembled there by aid of space station, then moved to GEO.

Second step: Deploy initial cable from the spacecraft.

Third step: Connect the cable with the Earth port (Anchor). With the help of centrifugal force the cable would stand upright.

You might think! How does centrifugal force work in space?

Centrifugal force: It is the force pulls the object apart, while in circular motion.

In space centrifugal force supports Space elevator. How means, As the Earth rotation, the cable attached to the Earth also rotate along with it. While rotation, the cable experienced an outward force which makes it to stand. And this is centrifugal force.

Fourth step: Strengthen the initial cable by sending hundreds of cable by use of climbers along the initial cable. This is why because the initially deployed cable is a single ribbon, this would not have that much strong to bear the whole system. Final step: After the completion of the construction, transportation with payloads begins. Fig.5 shows the structure of space elevator. The transportation velocity is 200 km/h.

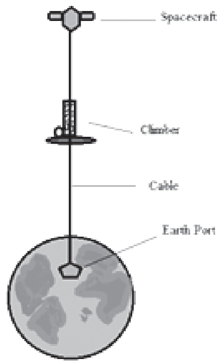


Figure 5: Space Elevator

Orbital stations such as GEO Station, LEO Station can be construct along the cable. For energy to the station, solar power is used and Free electron laser beaming system is used for the climber below the GEO orbit, because use of wired system and batteries may increase the climber mass though the climber is required light weight [1].

The object on the cable will be moving with various velocities. At the altitude below GEO, the object on the cable has lower orbital velocity than the orbital velocity that is necessary to keep its orbit and fall to earth if the object is separated from the cable. On the other hand, at the altitude above GEO, the object on the cable has the higher velocity than the orbital velocity that is necessary to keep on orbit and can be sent to the moon or another planet by its increased velocity when the object is separated. Thus, space elevator becomes an easy transportation system not only between the Earth to orbit but also between Earth to another planet [1].

Phases for Climbers

Ascent phases

Atmospheric Ascent (0 to 40 km): The initial climbing from atmosphere having some endangerment such as winds, lightning, rain, etc. For first 40 km climb the climber should be shielded by a large, lightweight box like shroud.

Basic Ascent (40 to 35,786 km GEO): The climber will be moving with the constant velocity. The climber will get power from laser power beaming system which is placed near the earth port. As the climber rises, Earth's Gravitational pull decline and the climber speed increases.

Beyond GEO Lift (35,786 to 100,000 km – GEO to Apex Anchor): Beyond GEO the centrifugal force will pull the climber outwards from the Earth, further, it increases the speed of climber. It needs to control the speed here by braking system and to control the heat energy produced by it. The climber will get power from sun through solar panels beyond GEO.

Descent phases

Descent from beyond GEO [100,000 to 35,786 km]: In this phase, as it descending, the climber will be climbing against the dominant force and need motors and energy [solar power] source.

Descent from GEO (35,786 to 40 km): Below GEO the power source would change from solar to laser power beaming. While the climber reaches 40 km, it will drop into the shroud for the further descending.

Atmospheric Descent (40 to 0 km): In this phase, a shroud will surround the climber to protect the payload from the atmospheric hazards and return back to the surface. This requires energy, braking system and energy [9].

Environmental Issues and their Solutions

Lightning and heavy wind can be avoided by moving the base station to some kilometres.

Atomic oxygen, it causes the cable to erode and this can be avoided by coating the cable with the erosion resistant material (gold platinum or aluminium) [7].

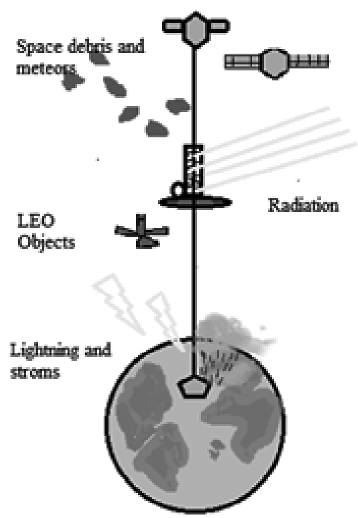


Figure 6: Challenges faced by Space elevator

Space objects and meteors collision can be avoided by sending a pulse through the cable from the ground. These pulses will cause a motion at a specific point and a second pulse to the original position to avoid vibrations and for a stable climbing on the cable.

Radiation, it is impossible to escape from the radiations in the space such as sun particles, galactic cosmic rays or exposure of high radiation from Van Allen Belts as shown in the Fig.6. It causes any malfunction or experience irreparable damage of elevator leading to catastrophic failures. Aluminium is the solution to this issue, it would shield and protect from radiation.

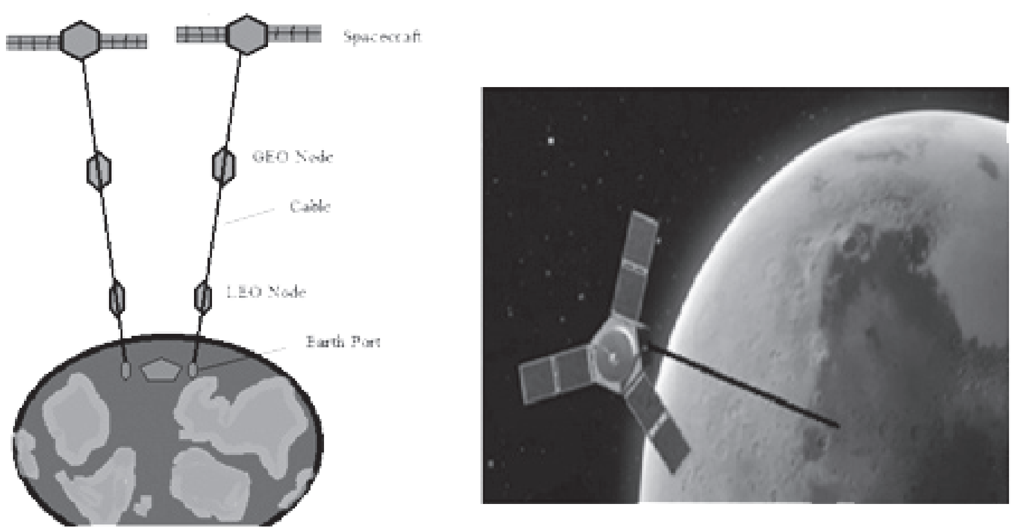
*Catastrophic failure***,** if the cable is break at one or more points, it will not cause more damage. Wherever the cut occurs, the upper portion of the cable will send to space. Lower portions will fall in the ocean, and space elevator will be operating at low velocity to avoid any occurrence of damage [3].

Massive Ideas with Space Elevator

Galactic Harbour

The Galactic Harbour Fig.7(a) is the next level of Space Elevator. It is the area incorporates the earth port with two space elevators, and stretches in a cylindrical shape. Galactic Harbour will be the transportation port as like as the sea port, all transportation to the space would be done here. Accompanied by LEO and GEO station along the cable, Galactic Harbour is similar to the train operation [8].

Some of the elevators work alone and some share its operational regions with one another. Some of these elevators are small and speedy and some have greater performance. This is called the "Family of Space Elevators". In the idea of Galactic Harbour, we can expect additionally two more Galactic Harbours in Indian Ocean and Atlantic Ocean, between 2035 and 2043 years. The purposes of Earth's Space Elevators are a) deliver cargo to the enterprises assembling along the geosynchronous belt near the Space Elevator's GEO Regions; b) deliver satellites to Earth orbits supporting various missions; and c) support interplanetary flights from the APEX Regions to the Moon, Mars, and elsewhere[6].



(a) (b)

Figure 7: (a) Galactic Harbour, (b) Martian elevator

Martian Elevator

Mars' surface gravity is just about **38%** of Earth's gravity, despite it rotates the axis as same as the Earth's time to rotate the axis. Due to this, the Mars' stationary orbit is much closer to its surface than Earth's. Therefore, it would be easy to construct a space elevator in Mars with existing materials.

A spacecraft with cable spooled inside it, will release at apex region. As the spacecraft reaches the Mars's stationary orbit it will deploy the cable to the Mars surface. When the cable reaches the Mars surface it would be anchored Fig.7 (b). A counterweight or space based power beaming station will sent to Mars. Once this finished, the Mars elevator is ready to transport from Earth to Mars or Mars to Earth with only a plane correction rocket, attitude adjustment thrusters and climbers. For example a climber will be sent up and release at particular altitude with specific velocity to reach mars. When Earth craft approaches Mars, it attach to the mars elevator and descent to the surface [2].

Launch Experiment

Japan stepped forward by launched a mini space elevator

Over a century people have just discussed the concept of Space Elevator. Researchers at Japan's Shizuoka University stepped forward by launched mini space elevators in 2018. The ultimate goal of these experiments is to test out technologies that could be used in space elevator and the summary is tabulated below (Table.1) [10].

PROJECT NAME	FEATURES	MISSION	RESULT
STARS (**S**pace **T**ethered **A**utonomous **R**obotic **S**atellite) Nick Name: KUKAI	1. Tether extension and recovery of (several m). 2. Tether space robot posture control. 3. Size: about 160mm cubic. 4. Mass: master unit 4.35kg, handset 3.61kg.	To demonstrate the technology of (Tethered Space Robot). It is a sub orbital space experiment. Launched on January 23, 2009.	Mission was completed and it is alive. Currently orbiting the earth.

PROJECT NAME	FEATURES	MISSION	RESULT
STARS-II (**S**pace **T**ethered **A**utonomous **R**obotic **S**atellite) Nick Name: GENNAI	1. Tether extension using gravity inclination. 2. Current collection by EDT (Beatether). 3. TSR control using tether tension due to gravity inclination. 4. Tether extension recovery by tension control. 5. Mass: unit-160 × 160 × 250mm, 5Kg, Slave unit-160 × 160 × 150mm, 4Kg.	To test an electro dynamic tether in low Earth orbit. Launched on February 28, 2014	The experiment was only partially successful, and tether deployment could not be confirmed. Re-entered the atmosphere on 26 April 2014.
STARS-C (**S**pace **T**ethered **A**utonomous **R**obotic **S**atellite) Nick Name: Hagoromo	1. Extension of tether (100m or more). 2. Construction of satellite development system at Shizuoka University. 3. Size: 2U (100x100x200) 4. Mass: Master unit 1.50kg Slave unit 1.16kg.	Technology demonstration of the tether extension in orbit. Released from the ISS on December 19, 2016.	There is no record of successful tether extension in orbit. 2018/03/03 - Hagoromo (STARS-C) has re-entered the atmosphere.
STARS-AO (1U CubeSat of "Stars satellite For" or "Stars Photo By" **A**stronomical **O**bservation) Nick Name:AOI	1. High-speed downlink communication of in -orbit space photography / astronomical observation / large-capacity image data. 2. Size: 1U (100x100x100) Mass: 1.33 kg.	To construct high-speed communication with ground using amateur radio. Launched on October 29, 2018	CW transmission has stopped on 2019/05/10

PROJECT NAME	FEATURES	MISSION	RESULT
STARS-Me (STARS Mini-elevator) Nick Name: Tenryu	1. Small-scale demonstration of orbital elevator. 2. Demonstration evaluation of 2 aircraft satellite + climber configuration, Convex tether extension, Climber movement. 3. Size: 2U (100x100x100 x 2 units) Total mass: 2.42kg.	To test out technologies that could be used in space elevator. Launched on October 06, 2018	CW reception is continuing, but the impression has not been confirmed
STARS-Me2 (STARS Mini-elevator#2)	1. Extension of tape tether from 1U unit 2. Ultra-small mobile robot moves on tether. 3. Photograph of spacecraft at one end with camera at the other end. 4. High-speed downlink of captured image. 5. Demonstration of integrated frame structure (MBF) / Satoshi Ishi Made by Tetsuko Co., Ltd. 6. Size: 1U (100 x 100 x 100). Total mass: 1.33kg.	To test out technologies that could be used in space elevator.	To be released from ISS, Under development

PROJECT NAME	FEATURES	MISSION	RESULT
STARS-EC (STARS Elevator of CubeSat)	1. Ultra-small orbital elevator with 3U CubeSat. 2. Tether extension from 1U CubeSat at both ends (11m each, 22m total). 3. Middle 1U CubeSat moves on tether. 4. Size : 3U (100 x 100 x 300). 5. Total Mass: 3.8kg.	To test out technologies that could be used in space elevator.	Released in 2021 NEW (waiting for shipping)

Table 1: Japan Experiments

Application of Space Elevator

Space Elevator's main goal is to reduce the launching cost for space exploration without rockets. Space elevator will lift payload as well as human in a safe manner. It is used for the deployment of Earth-orbiting satellites for telecommunications, military, Earth monitoring, etc. Space elevator will greatly help to deploy the satellites in Low Earth Orbit and Geosynchronous orbit. It paves the way to space transportation station, assembly station for spacecrafts and space tourism.

We can built Solar power satellites consist of square miles of solar arrays that collect solar power and then beam the power back to Earth for terrestrial consumption [4][11].

Advantages of Space Elevator

Space elevator will reduce the cost of space operations. We can easily implement at many solar system locations. It would be a safe access to space without any high-cost and risky rocket launches.

Disadvantages of Space Elevator

The entire structure of space elevator is massive to construct and it will take more time for the construction [11].

CONCLUSION

In the development of science and technologies, space elevator would become a new way of access to explore the space. The space elevator will accomplished within the next decades. It is a revolutionary Earth-to- space transportation system. In future we will be having a safest and cheapest trip to space without any dangerous launches. The great advantages of space elevator will improve the environment and reduce the space debris. High transmission in telecommunication and space tourism will also become habituated. Space elevator could provide an easy and regular way to get into space. In a few more years, space elevator and technologies will help as to spread the human civilization beyond earth.

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REFERENCES

1. Space Elevator and Its Research and Development at Present by Yoshiki Yamagiwa, Space Japan Review, No. 85, 2014.
2. Space elevator NIAC phase 1 final report by Bradley. C. Edward, 2000.
3. Space elevator, A study in Cable Design and more by NatBradley Hontz., Mohar Kalra., Rachel Lange., Niyant Narang and Danny Maguire, New Jersey, 2016.
4. Space elevator NIAC phase 2 Final report by Bradley. C. Edward, 2003.
5. Yucui wu., Xinnan Lin., and Min zhang, Journal of Nanomaterials, 2013, Article ID 627215.
6. Today's Space elevator by Peter swan., and Micheal Fitzerald, Published by Lulu.com, 13, 2019, ISBN: 978-2917761311.
7. Nicola M. Pugno., J. Phys. Condens. Matter, 18, (2006) S1971–S1990.
8. Space elevator are the transportation story of 21st century by Peter Swan., Cathy Swan., Michael Fitzgerald., Matthew Peet., and James Torla Vern Hall, ISEC Position Paper, 2, 2020.
9. Design consideration for space elevator tether climber by Peter. A. Swan., Cathy. W. Swan., Robert E. Skip Penny Jr., John. M. Knapman., and Peter. N. Glaskowsky, ISEC Position Paper, 1, 2013.
10. STARS Project, stars.eng.shizuoka.ac.jp.
11. Space elevator A new way to gain orbit by Adil Oubou, 2014.
12. Gilbert. D. Nessim., Journal: Nanoscale, 2, 2010, pp1306-1323.

CUSTOMER SATISFACTION TOWARDS SMARTPHONES
(A STUDY WITH REFERENCE TO XIAOMI)

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ABSTRACT

Customer satisfaction is a term frequently used in marketing. It measures of how product and services supplied by a company meet and surpass customer expectation. All the competitors try to expand and create new brands to attract customer towards their product. Xiaomi is Bejing based company that primarily manufactures smartphones. The company was founded by LEI JUN. He currently serves as the company's chairman and CEO. The company's first product is android software, with its first smartphone Xiaomi MI 1 released in august 2011. Xiaomi entered in India on July 15, 2014 with an exclusive sales tie-up with Flipkart for the smartphone MI 3.

An analytical and descriptive study was made based on primary data collected from various respondents who were using Xiaomi smartphones. Using survey method structured questionnaire was formed and convenience sampling method was used to collect data from 100 respondents. Statistical tools used in this study was percentage analysis, Hendry Garrett ranking technique, weighted average test, chi-square test by using SPSS package.

Celebrity endorsement decides the perception towards buying behavior of the customer. Respondents specified that, they prefer Xiaomi smartphones due to the reasonable price available at market. Software updates given by the Xiaomi smartphones gives more level satisfaction to the customer. Chi-square test reveals that there is no significant relationship between gender and years of xiaomi smartphones usage.

The satisfaction of the customer decide the company's position in the world market. It depicts that reasonable price and low radiance abortion of Xiaomi smartphones would increase brand image in the world market. It shows that Xiaomi smartphones is mostly preferred by the students. Xiaomi has more feature at reasonable price that made it stand high among its competitors like Samsung, Viva, Oppo etc. At last, xiaomi brand secure the top most rank in India by satisfying their customer through new updates in smartphones.

Keywords: *Customer satisfaction, Xiaomi smartphones, Consumer's preference, Factors influence.*

INTRODUCTION

Customer satisfaction determines that, how happy customers are with a company's products, services, and capabilities. Customer satisfaction information, including surveys and ratings, can help a company determine how to best improve or changes its products and services. The Xiaomi is a Bejing based company that primarily manufactures smartphone. Xiaomi meteoric growth has taken it from start up to major player in just a few years. Xiaomi have started collaboration among partners including mobile chip developer QUALCOMM and Temasek holdings, which is an investment firm owned by the Singaporean government. The company's first product was android software, with its first phone the Xiaomi MI 1 released in august 2011.

The company was founded by **LEI JUN**. He is currently serves as **XIAOMI CHAIRMAN** and **CEO.** Xiaomi makes and invests in smartphones, mobile apps, laptop, bags, trimmers, earphones, MI Television, Shoes, fitness bands, and many other products. Xiaomi is the youngest company on fortune global 500 List for 2019. Xiaomi released its first smartphone in August 2011 and rapidly gained market share in China to become the country's largest smartphone company in 2014. In second quarter of 2018, Xiaomi was the world's fourth-largest smartphone manufacturer, leading in both the largest market, China, and the second-largest market in India.

Review of Literature

Akkuccuk.u & Esmaellix. J (2016) in the research titled **"the impact of brands on customer buying behaviour; an empirical study on smartphone buyers"-** made an attempt to understand the factors behind smartphone purchase decisions of consumers. The study involves a questionnaire administrated to 171 smartphone consumers. The clients were chosen by convenience sampling among the students from a university. The most important and effective strategy to influence consumer behaviour in the product selection was emphasizing the "brand name" of the product. Brand equity was a set brand assets and liabilities linked to a brand name and symbol, which add to or subtract from the value provided by a product or service. The result indicated that the majority of the smartphone buyer's decisions were mainly influenced by brand loyalty and brand awareness perceived eminence and brand association do not seems to control purchase decisions for the model of the study.

Cristina Calvo-Porral (2016) in this research titled **"The influence of switching costs and satisfaction towards smartphone service providers"-** analysed how the switching costs and customer satisfaction influence customers loyalty towards the smartphone service provides. The sample was collected among 370 consumers. The analysis developed through the structural equation model. The findings proposed that customer satisfaction with their smartphone service is determined by two variables they are (service value, corporate image). Aim of the findings is highlight low switching costs, service providers should focus their marketing efforts towards attracting new customers and increasing primary demand, rather than retaining their existing customers. The conceptual proposed model suggest that cost will determines customer satisfaction and loyalty for smartphone services.

Seekwonggoh, Nanjiang, Muhamad faiz Abdulhak, peilengtee (2016) in this research titled "**Determinants of smartphone repeat purchase intention among Malaysians: a modernisation role of social influence and mediating effect of consumer satisfaction"-** examined impact of consumer inertia and product attribute on repeat purchase. The study intends to valid a moderator role of social influence (SI) impacting the association between consumer inertia and RPI. The data was collected among 220 Malaysian consumers. The statistical tools used in this study was hypothesis. The study associates the relationships and impacts among several critical variables. Satisfaction partially mediates the relationship between PA and RPI. The study concluded that moderator role of social influence interacts with consumer inertia to have an impact on the level of the RPI.

Y.A. Sembodo (2018) in this research titled **"the effect of functional value, social value, emotional value, monetary value and customer satisfaction towards consumer repurchase intension of Xiaomi redmi note 4 in Surabaya (doctoral dissertation)"-**Examined the effects of customer satisfaction on repurchase of redmi note 4 in Surabaya. In the study the data was collected among 130 customers who used redmi mobile. SPSS and conservative methods like descriptive analysis, single and multiple linear regression analysis used to test the relationship between the variables. The study was to find out the repurchase intention of the customer. The study revealed significant result of Functional Value, Emotional Value, Consumer Repurchase Intention, while Social Value insignificantly effect Customer Satisfaction.

Archana Rajpoot (2019) conducted a study on **"analysis of consumer perception towards redmi smartphone"-**to present the consumer perception and satisfaction towards different feature redmi smartphone. The sample was collected among 47 respondents from both male and female. The study was an attempt to find out whether the customers are satisfied with the different varieties and services provided by the Redmi smartphone. Mean, Standard Deviation and T-test as a statistical tool are used for data analysis. The study proposes useful suggestions to redmi smartphone manufactures and retail outlet for knowing the consumer perception and satisfactory level. The study analysed the consumer purchasing preference for redmi smartphone on the basis of different features in three categories (quality, services and design).

Objective of the Study

- To analyse the factors that influence the buying behaviour of customers towards Xiaomi smartphones.
- To study the preference of customers towards Xiaomi smartphones.
- To analyse the satisfaction level towards Xiaomi smartphones.
- To examine the suggestions of recommendation given by the customers about Xiaomi smartphones.

Methodology

Descriptive and analytical study, based on both primary and secondary data were used. Primary data was collected from various XIAOMI smartphones users.

1. Period of study

The primary data required for the study was collected during November 2019 – February 2020 from various Xiaomi users through questionnaire.

2. Research site and unit of analysis

The primary data required for the study was collected by contacting Xiaomi smartphones users of different age groups.

3. Sampling design

The primary data was collected from 100 Xiaomi respondents. The secondary data was collected from the information published from journals, books and research articles.

4. Questionnaire structure and design

The questionnaire was divided into four parts

- Part – I deals with demographic factors.
- Part – II defines about smartphone.
- Part – III describes about the awareness towards purchase of Xiaomi smartphones.
- Part – IV reflects the satisfaction level of using Xiaomi smartphones.
- Part – V states the improvements that can be made in the Xiaomi smartphones.

5. Frame work analysis

The collected primary data has been statistically processed, classified and tabulated by using appropriate methods. Tables, figures and statistical results have been derived with the help of computer software package called SPSS (Statistical Packages for Social sciences). Percentage analysis, weighted average test, Garrett ranking technique and chi-square test were used to analyse the data by using SPSS Package. These were used to know the customer satisfaction while using Xiaomi smartphones.

Limitations of the Study

- The study is confined for a specific period. Hence the sample size is 100.
- The study is based upon primary data, so any wrong information given by respondents may mislead the findings.

Analysis

- 'Sources of awareness about xiaomi smartphones' was subjected to percentage analysis. 42% of the respondents get awareness through word of mouth.

Particulars	Total	Mean Score	Rank
Long lasting battery life	4165	41.65	**VII**
Screen display (super amoled)	4312	43.12	**IV**
Reasonable price	4921	49.21	**I**
RAM	4534	45.34	**II**
Pixel quality of the camera	4319	43.19	**III**
Sound quality of the mobile	10572	10.57	**VIII**
Size of the smart phone	4284	42.84	**V**
More internal storage for the mobile	4230	42.30	**VI**

Table: 1 Feature preferred before buying Xiaomi Smartphones

'Features preferred before buying xiaomi smartphones' was analyzed using Garett ranking technique. Rank I Was Assigned to the Most Preferred Factor "Reasonable Price" With Mean Score of 49.21, Rank II Was Assigned to "RAM" With Mean Score Of 45.34.

Factors	Total	Average Score	Rank
Overall positive aspect outweigh the negative aspect in the smart phone.	218	14.53	XI
Xiaomi smart phone brand gives me good reputation.	224	14.93	IX
I prefer xiaomi brand despite of its price.	247	16.47	IV
Brand name is the major factor that affects my buying decision.	249	16.6	III
I usually prefer xiaomi smart phone than laptop for easy access.	253	16.87	II
I would like to be brand loyal towards xiaomi smart phone.	232	15.47	VII
Xiaomi has more in-built applications than other smart phone.	211	14.07	XII
Social pressure affects my choice of buying xiaomi smart phone.	244	16.27	VI
Advertisement influence my smart phone buying behaviour	246	16.4	V

Factors	Total	Average Score	Rank
Celebrity endorsement creates a sense of urge and desire to buy a new launch smart phone.	254	16.93	I
Xiaomi offer more benefits to customer	230	15.33	VIII
Xiaomi is one of the trustworthy brand to buy smart phone	220	14.67	X

Table: 2 Perception towards Purchase of Xiaomi smartphones

'Perception towards purchases of xiaomi smartphone' was analyzed using weighted average test. Rank I was assigned to "Celebrity endorsement creates a sense of urge and desire to buy a new launched Xiaomi smartphone" with average score of 16.93, rank II was assigned to "I usually prefer xiaomi smart phone than laptop for easy access" with average score of 16.87.

Factors	Total	Average Score	Rank
Huge variety in the market.	222	14.8	X
Availability of different colour.	231	15.4	VII
Availability of Xiaomi mobile in the market.	235	15.67	V
After sale service	237	15.8	III
Mobile phone Guarantee & Warranty	236	15.73	IV
High pixel Camera	211	14.07	XV
sound effects/Quality	212	14.13	XIII
Device safety & security	226	15.07	IX
Processor speed	215	14.33	XII
Software updates	246	16.4	I
High-end phones at reasonable price	242	16.13	II
Internet speed	229	15.27	VIII
Battery life	210	14	XVI
Provision of sim card and SD card	234	15.6	VI
Finger print sensor	211	14.07	XIV
Pixel quality of the screen	218	14.53	XI

Table: 3 Level of Satisfaction towards usage of Xiaomi Smartphones

'Level of satisfaction towards usage of Xiaomi smartphones' was analyzed using weighted average test. Rank I was assigned to "Software updates" with average score of 16.4, rank II was assigned "High-end phones at reasonable price" with average score of 16.13.

Other Findings

- 59% respondents were Female.
- 75% respondents were students.
- 31% respondents considered that effective mode of advertisement is television advertisement.
- 45% respondents prefers online shopping.
- 81% respondents would suggests Xiaomi smartphones to others.

Suggestions

- Youngsters are fascinated towards the advanced models in smartphones with a preferable rate. Therefore, the Xiaomi Company should concentrate in introducing advanced model.
- Increasing the service quality would help to maintain its reputation in the highly competitive market.
- Provision of accessories like Ear phones along with the purchase of smartphones would satisfy the customers.
- Though High Internal storage were given in Xiaomi smartphones, more internal storage space are occupied by in-built apps. Therefore, measures can be taken to avoid such complaints.
- Dolby Atmose speaker system could be adopted to increase the sound quality.

CONCLUSION

The satisfaction of the customer decides the company's position in the world market. As competition is increased among all the smart phones company they were aggressively moving to attract customer by offering attractive promotion and services.

It has shown that reasonable price of the smartphone and reducing the radiance abortion of the Xiaomi smart phone can increase the image of the brand in the world market. As the Customers give priority to their desire and expectation, if such expectations were properly identified, a healthy bonding with the customer can be established by the company.

At length, Xiaomi smartphones is mostly preferred by the students. Xiaomi has more features at reasonable price that made it to stand high among its competitors like Samsung, Oppo, Vivo etc., As a result, Xiaomi secured the top most rank in India in the year 2019.

REFERENCES

1. Akkucuk, Ulas, and Javed Esmaeili. "The Impact of Brands on Consumer Buying Behavior." International Journal of Research in Business and Social Science (2147-4478) 5.4 (2016): 1-16.
2. Calvo-Porral, Cristina, and Jean-Pierre Lévy-Mangin. "The influence of switching costs and satisfaction on loyalty towards smartphone service providers." IJMC 14.4 (2016): 309-327.
3. Goh, See Kwong. "Determinants of smartphone repeat purchase intention among Malaysians: a moderation role of social influence and a mediating effect of consumer satisfaction." International Review of Management and Marketing 6.4 (2016): 993-1004.
4. Sembodo, yohana alvania. The effect of functional value, social value, emotional value, monetary value, and customer satisfaction towards consumer repurchase intention of Xiaomi redmi note 4 in Surabaya. diss. 2018.
5. Rajpoot, Archana. "Analysis of customer perception towards redmi smartphone." Journal Current Science 20.06 (2019).

THE LAST FINANCIAL SCAM OF INDIA IN 2020

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ABSTRACT

Financial scams are not new for India and it's been interestingly designed by our country's top entrepreneurs for many years. From the advent of 1948's Jeep scandal our country has been witnessing more serious scams like the scam of 1992, the Harshad Mehta's stock market scam. And during 90's scams were rapidly increasing in India. Later Satyam scam impaired India's financial system which got people's attention and paved way for many other scams which involved huge amount. The number of financial scams in India is gearing up for past ten years. This made a greater crisis in the Indian economy and has influenced stock markets negatively. The latest scam in India by Dilip Chhabria is the last financial scam of India in 2020.

Keywords: *Financial scam, financial system, Indian Economy.*

INTRODUCTION

India has been encountering many scams involving huge amounts that are constantly affecting the Indian economy and many economists state the effects of scam in the economy. Till now the PNB scam (Punjab National Bank Scam) involving IND Rs.11600 crores (US$1.77 billion) is regarded as the biggest scam in India. The number of financial scams in India is gearing up for past ten years. This made a greater crisis in the Indian economy and has influenced stock markets negatively. Failure of auditing, non effective guidelines by the government and not following the prescribed guidelines by banks are considered to be the main causes of scams. The strict rules must be made by the respective authorities to control the scams in India. The very recent scam by Dilip Chabbria has once again proved that the rules are not effective and managed efficiently by the authorities. The Scam 1992 was a great example of exploiting the loop holes in the system. Harshad Mehta, the Big Bull of Indian share market had evidently forged BRs during 90s and it came to limelight in 1992.The present case of the automotive stylist Dilip Chhabria is again a problem creator in the economy in terms of finance. The case is being under investigation as the fraud amount is increasing day by day.

The Founder of DC Design – India's first sports car

DC Avanti considered as the first sports car of India had recently earned the attention of people by defrauding approximately IND Rs.100crs by its founder Dilip Chabbria. The automotive stylist designed the exteriors and interiors of the cars and it came to limelight by the international circuit when Aston Martin and Dilip Chhabria signed a contract for a running prototype of an Aston Martin model. He was designing and manufacturing DC Avanti under the board DC Design.Pvt. Ltd. His works are well known for its futuristic makeover, which was his core competence. In 1993, he set-up Dilip Chhabria Design and so far built over 700 concepts to its customers. The customers of the company are the auto majors like Renault, GM, BMW, Daimler, Ford, Toyota, Fiat, Tata Motors, Maruti Suzuki, Bajaj Auto, Ashok Leyland, as well as celebrities and high net worth individuals.

THE SCAM 2020-21– Dilip Chhabria

The DC Avanti scam came to light after a person from Tamil Nadu who had purchased the DC Avanti – worth Rs 42 lakh – committed a traffic violation. During the investigation of the traffic violation the registration of the vehicle was found to be bogus as it was same with another vehicle in Haryana and when the owner of the car was questioned, the true colors of Chhabria came out. After the complainant's statement Mumbai police filed FIR against Chhabria and this was the leak point of scam and the investigation proceeded further which led to the arrest of the owner of car modification studio 'DC', Chhabria on 28th December 2020 and was booked under section 420 (cheating), 465, 467, 468, 471, 120 (B) and 34 of the Indian Penal code (IPC).

Allegations of the Scam

Allegation 1: Cars with same engine and chassis numbers

As a known fact every car must have different engine and chassis number, and must be registered in RTOs. When the cars are under traffic violation the police will be writing to the concerned RTO's so that they can plug loopholes in the system. In the present case it has been alleged that Chhabria has sold multiple cars with the same engine and chassis numbers. And it was proved in the case of sale of 42 lakh worth car to a Tamil Nadu person.

Allegation 2: Fake customers

The top automotive stylist fraudulently took loans in name of customers who were actually fake and the crime branch suspected that three- four NBFCs were involved and they provided loans to Chhabria even before the vehicles were registered. And further he had reportedly taken loans on his own vehicles and sold them to third parties.

Allegation 3: Sold the Hypothecated cars

The cars that were hypothecated in the banks were reportedly sold off to the customers and thus defrauded huge amount in terms of loans from financial institutions. The amount is being calculated by the crime branch of Mumbai. The loans for each cars were around 42 lakhs and they had reportedly sold 120 DC Avanti cars all over the world out of which 90 cars where allegedly used to obtain fraudulent loans.

With the rise of this scam the car studio‘s reputation had been ruined.

CONCLUSION

Scams warn the government and other respective superior authorities to lay down more effective guidelines in monitoring the financial transactions involving huge amounts and make it work efficiently. It’s a reminder for every rule makers and the funding institutions to follow the laid principles. The audited work of the companies should be checked and scrutinized when faults are addressed. The strict monitoring of rules should be achieved through effective measures taken against the crisis. The government should look upon the matters like scam which are a constant threat to the country’s economic growth.

WEBSITES

1. https://indianexpress.com/article/explained/who-is-dilip-chhabria-and-why-did-mumbai-police-arrest-him
2. https://news.abplive.com/entertainment/dilip-chhabria-famous-car-designer-and-owner-of-dc-design-arrested-in-mumbai
3. https://en.wikipedia.org/wiki/Dilip_Chhabria
4. http://www.dcdesign.co.in

CORONA VIRUS PANDEMIC AND ITS IMPACT ON INDIA'S GROSS DOMESTIC PRODUCT

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ABSTRACT

Corona virus is originated in China and spread all over the world. This virus stopped many economic activity and affected the world wide economy. The expedition of the corona pandemic is an unprecedented shock to the Indian economy the economy was already in a slow growth before corona. The country wide lock down, decrease in demand and supply chains, globe economy downturn leads to a negative growth rate in a economy. Nearly all the sectors in a economy were affected. GDP is an indicator for economic development of the country. On this study we are going to analyze India's gross domestic growth after corona virus pandemic.

Keywords: *Pandemic , negative growth, lock down, Gross domestic product.*

INTRODUCTION

India is the world's fifth largest economy by nominal GDP and third largest purchasing power. But now there is a draw back in the purchasing power due to corona Pandemic. GDP is measured by current and constant prices. Measure using constant prices gives the real value and measure using constant price gives the nominal value.

How the Corona Affected the Different Sectors of the Economy

S.No	Sector	GDP Growth Rate at Q2 2020-21
	AGRICULTURE SECTOR	
1.	Production of rice	-2.9
2.	Production of fish	12.4

	MANUFACTURING SECTOR	
1.	Production of coal	5.5
2.	Production of crude oil	-5.7
3.	Production of cement	-10.6
4.	Consumption of steel	-4.0
5.	Sales of commercial vehicles	-20.1
6.	Manufacture of private vehicles	2.1
	SERVICE SECTOR	
1.	Travel and tourism	-8.0
2.	Hotel	-47
3.	Information technology	7.7

Source: National Statistical Office Ministry of Statistical Programme Implementation (mospi)

National Statistical Office (NSO) has released the estimates of gross domestic product in constant price with a base year (2011-12). With the view to contain the spread of pandemic, restrictions were imposed on the economic activity. Only the primary sectors where working and the essential commodities where produced and sold. The manufacturing sector suspended their operations for few months as per government rules the travel and tourism is affected hardly due to country wide lock down.

The Impact of GDP Growth after Corona Virus

There is a huge draw backs in each and every sector during the corona pandemic. The STATEMENT 1 quarterly estimates of expenditure on GDP in Q1(April – June) and Q2 (July-September) of 2020-21(at 2011-12 prices).

Industry	Expenditures of Gross Domestic Product									
	2018-19		2019-20		2020-21		Rates of GDP (%)			
							2019-20		2020-21	
	Q1	Q2	Q1	Q2	Q1	Q2	Q1	Q2	Q1	Q2
1. Private Final Consumption Expenditure (PFCE)	18,89,008	19,03,853	19,92,967	20,25,488	14,61,164	17,96,290	56.4	56.5	54.3	54.2
2. Government Final Consumption Expenditure (GFCE)	3,93,709	4,07,780	4,18,249	4,65,643	4,86,636	3,62,368	11.8	13.0	18.1	10.9
3. Gross Fixed Capital Formation (GFCF)	10,82,670	10,77,942	11,32,195	10,35,736	5,99,192	9,59,628	32.0	28.9	22.3	29.0
4. Change in Stocks (CIS)	64,131	66,159	67,328	66,999	53,336	71,208	1.9	1.9	2.0	2.1
5. Valuables	41,080	44,629	51,347	51,761	4,645	20,995	1.5	1.4	0.2	0.6
6. Exports	6,86,695	7,19,352	7,08,546	7,03,282	5,67,961	6,92,568	20.0	19.6	21.1	20.9
7. Imports	8,08,933	8,60,843	8,25,788	7,79,637	4,92,286	6,45,851	23.4	21.8	18.3	19.5
8. Discrepancies	10,803	73,679	-9,576	15,062	8,908	56,962	-0.3	0.4	0.3	1.7
GDP	**33,59,162**	**34,32,553**	**35,35,267**	**35,84,335**	**26,89,556**	**33,14,167**	**100.0**	**100.0**	**100.0**	**100.0**
GDP (Percentage change over previous year)			**5.2**	**4.4**	**-23.9**	**-7.5**				

Source: National Statistical Office Ministry of Statistical Programme Implementation (mospi)

The absolute value of goods and services produced in India in first quarter is get reduced to -23.9% than the entire cost of the goods and services produced in the same three months in 2019 first quarter.

The most damaged sectors were manufacturing, construction, hotels, mining, travel and tourism and power sector. These sectors provide maximum new employment opportunities.

The auto mobile industries were working at zero output. There is a negative growth in gross domestic product after lock down. During the second quarter there is a increase in the growth rate. At second quarter the growth rate is -7.5%. I think during the third and fourth quarter the GDP growth rate will remain negative and it may be turned positive during the first quarter of next financial year.

Demand Problem

If the GDP of the next year become positive it will not exist for a longer period of time due to lack of demand. By analyzing the GDP growth of different sector we came to know that there is a lack of demand in the economy. The government can make suitable policy to increase the demand in a economy for a sustainable growth.

CONCLUSION

The government can increase it's expenditure to increase overall GDP growth by making structural measure, framing new policy for each sector to increase the growth rate of our country. To increase the overall GDP the government can provide money to workers in unorganized sector to increase their demand and consumption rate.

WEBSITES

1. https://youtube/WJF3DAVAOau.
2. www.mospi.gov.in – published by national statistical office on November 2020.

UNDERSTANDING AND VISUALIZING DATA (CHARTS AND GRAPHS)

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ABSTRACT

Graphs are a common method to visually illustrate relationships in the data. Graphs are effective visual tools because they present information quickly and easily. It is not surprising then, that graphs are commonly used by print and electronic media. Sometimes, data can be better understood when presented by a graph than by a table because the graph can reveal a trend or comparison. Students also find that graphs are easy to use because graphs are made up of lines, dots and blocks—all geometric forms that are simple and quick for students to draw. In the world of statistics, graphs display the relationship between variables or show the value spread of a given variable or phenomenon. Graphs and charts condense large amounts of information into easy-to-understand formats that clearly and effectively communicate important points. Although there are myriad computer programs that can generate a graph, we must still need some basic principles. A basic requirement for a graph is that it is clear and readable. It is important to provide a clear and descriptive legend for each graph. If a horizontal and a vertical axis are used, they are usually referred to as the x-axis and y-axis respectively. Each axis will have a scale, denoted by periodic graduations and usually accompanied by numerical or categorical indications. Each axis will typically also have a label displayed outside or beside it, briefly describing the dimension represented. If the scale is numerical, the label will often be suffixed with the unit of that scale in parentheses. For example, "Distance traveled (m)" is a typical x-axis label and would mean that the distance traveled, in units of meters, is related to the horizontal position of the data within the chart. Graphs may have several parts, depending on their format: (1) a figure number, (2) a caption (not a title), (3) a headnote, (4) a data field, (5) axes and scales, (6) symbols, (7) legends, and (8) a credit or source line. Businesses have many uses for graphs and charts. There are many types of graphs and charts, making it easy for a business to choose the one that fits their needs the most. In this paper, let's take a look at some choices of graphs and charts commonly used.

INTRODUCTION

Visual representations help us to understand data quickly. When you show an effective graph or chart, your report or presentation gains clarity and authority. The main functions of a chart are to display data and invite further exploration of a topic. Within the graph a grid of lines may appear to aid in the visual alignment of data. The grid can be enhanced by visually emphasizing the lines at regular or significant graduations. The emphasized lines are then called major grid lines and the remainder are minor grid lines. The data may appear as dots or shapes, connected or unconnected, and in any combination of colors and patterns. Charts are used in situations where a simple table won't adequately demonstrate important relationships or patterns between data points.**Our brains process graphical data in a different way to text. It will subconsciously seek a visual center that draws the attention. Using bright colors for areas that has to be emphasized, and avoiding tilting or angling the chart, is a good practice to avoid confusion.A proper unbiased data set plays a vital role in order to get a good visualization of it.To explain the importance of graphs , the covid-19 pandemic data has been chosen.**

Coronavirus is a family of viruses that can cause illness, which can vary from common cold and cough to sometimes more severe disease. Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV) were such severe cases with the world already has faced , SARS-CoV-2 (n-coronavirus) is the new virus of the coronavirus family, which first discovered in 2019,which has not been identified in humans before. It is a contiguous virus which started from Wuhan in December 2019.On January 30, India reported its first case of COVID-19 in Kerala, which rose to three cases by February 3.On 22 March 2020, India observed a 14-hour voluntary public curfew at the instance of the prime minister Narendra Modi.The government followed it up with lockdowns in 75 districts where COVID cases had occurred as well as all major cities.Further, on 24 March, the prime minister ordered a nationwide lockdown for 21 days, affecting the entire 1.3 billion population of India.On 14 April, Prime minister Narendra Modi extended the nationwide lockdown until 3 May, with a conditional relaxations after 20April.On 1 May, the Government of India extended the nationwide lockdown further by two weeks until 17May .On 30 May, it was announced that lockdown restrictions were to be lifted from then onwards, while the ongoing lockdown would be further extended till 30 June for only the containment zones. After that Services resumed in a phased manner starting from 8 June , termed as "Unlock 1.0".The second phase of unlock, Unlock 2.0, was announced for the period of 1 to 31 July.Unlock 3.0 was announced for August.Similarly, Unlock 4.0 was announced for September and Unlock 5.0 for the month of October.In the same way, Unlock 6.0 was announced for the month of November,Unlock 7.0 was announced for the month of December.Unlock 8.0 was announced for the month of January, and Unlock 9.0 was announced for the month of February , with increased relaxations everytime.we have used *python programming language* to plot the graphs for the Taminadu covid data , dated from march 30, 2020 to january 11 ,2021.This articles explains the following graphs ,

- Line graphs
- bargraphs
- stackplot

- scatterplot
- boxplot
- histogram
- kde plot
- joint plot
- pairplot
- piechart

Python Libraries

In order to draw graphs in python we have to import some libraries, which are as follows:

- import numpy as np (in order to perform certain mathematical claculations)
- import pandas as pd (in order to clean large data without errors and missing values)
- import matplotlib.pyplot as plt (used for basic plotting)
- import seaborn as sns(used for drawing attractive statistical graphics)

Dataset

The source data is taken from the following website :

'https://api.covid19india.org/states_daily.json' (as json file)

we import this data into python as ;

Code:

```
url = 'https://api.covid19india.org/states_daily.json'
import urllib.request
urllib.request.urlretrieve(url, 'data.json');
covid_data = pd.read_json('data.json')
import json
with open('data.json') as f:
data = json.load(f)
data = data['states_daily']
df = pd.json_normalize(data)
df_ = df[['tn', 'date', 'status']]
df_ = df_.pivot_table(values="tn", columns="status", index="date")
```

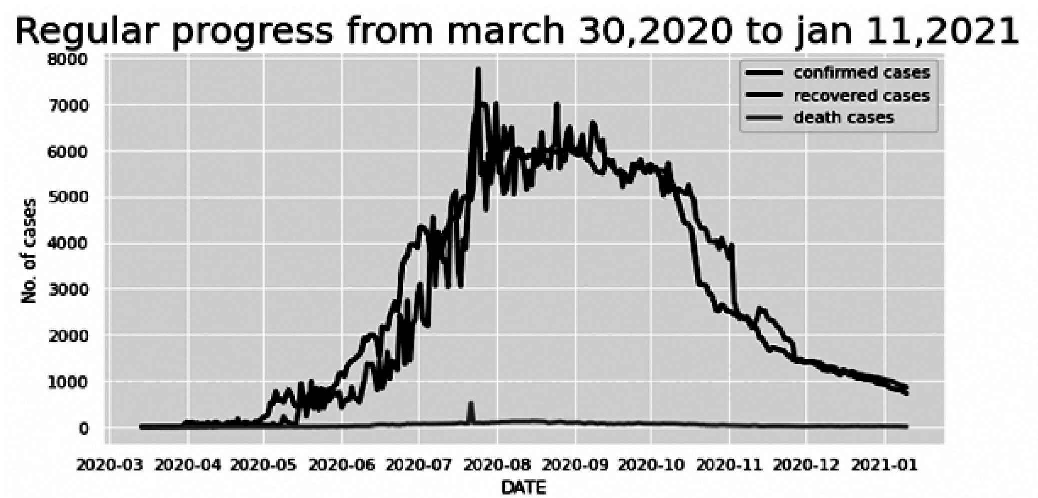
*we have represented the tamilnadu covid – 19 data as "df_tn"

Line graphs

- Line plot simply use a line to connect the data points that you plot. They are most useful for showing trends. The following graph shows the plot for Confirmed, Recovered and Deceased cases.

Code:

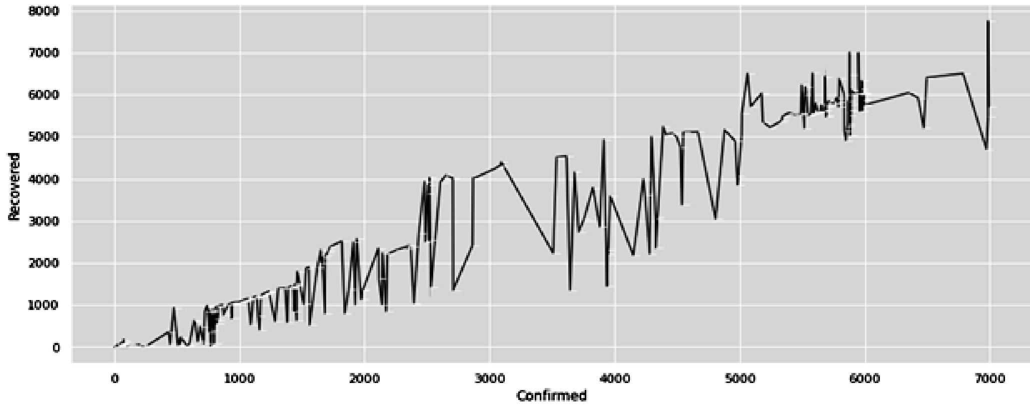
```
plt.figure(figsize=(10,5))
plt.plot(df_tn.Confirmed,label = "confirmed cases",linewidth=3)
plt.plot(df_tn.Recovered,label = "recovered cases",linewidth=3)
plt.plot(df_tn.Deceased , label = "death cases",linewidth=3)
plt.xlabel("DATE")
plt.ylabel("No. of cases")
plt.legend()
plt.title("Regular progress from march 30,2020 to jan 11,2021 ",fontsize = 25)
```



- Seaborn Line Plots depict the relationship between continuous as well as categorical values in a continuous data point format.

Code:

```
sns.lineplot('Confirmed', 'Recovered', data=df_tn, marker=True , estimator = np.median);
```



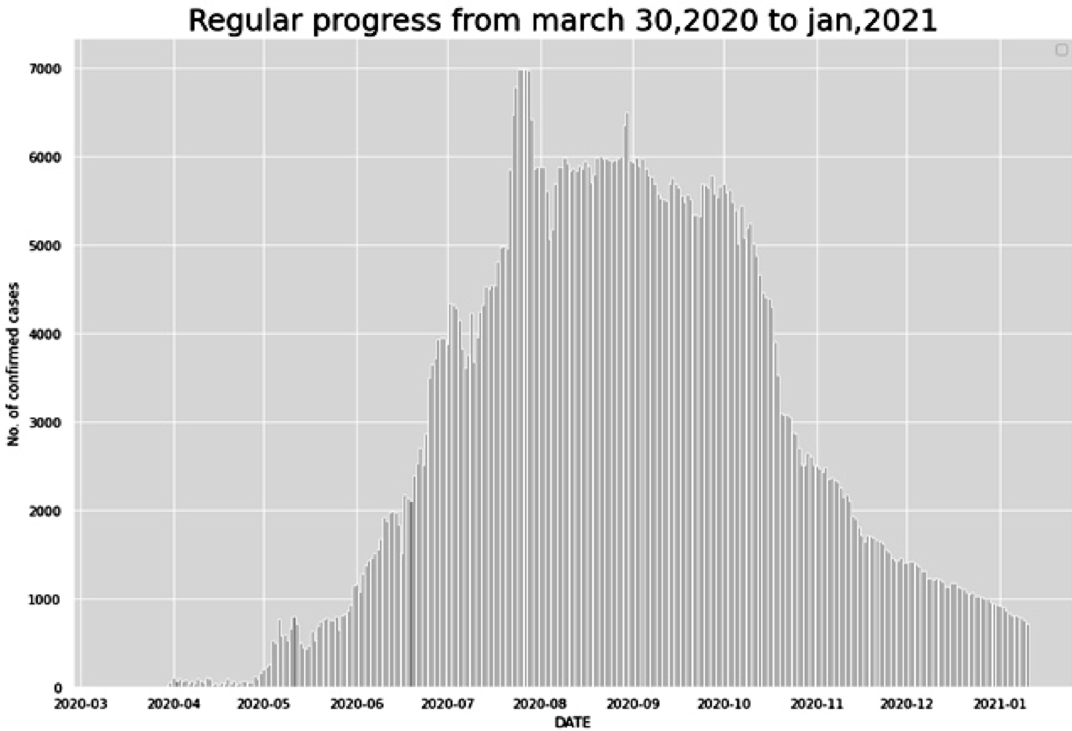
- *This graph clearly shows a positive trend , that is , as the confirmed cases increases , the recovering cases also gets increased in TamilNadu.

Bar Graphs

Another type of graph that shows relationships between different data sets is the bar graph. In a bar graph, the height of the bar represents the measured value: the higher or longer the bar, the greater the value. The following graph represents the number of confirmed cases from march 30 till jan 11.The x – axis is divided at each month.

Code:

```
fig = plt.gcf();
fig.set_size_inches(15, 10);
plt.bar(df_tn.index, df_tn.Confirmed);
plt.xlabel("DATE")
plt.ylabel("No. of confirmed cases")
plt.legend()
plt.title("Regular progress from march 30 , 2020 to jan 11,2021  ",fontsize = 25)
```



- *this graph clearly shows a normal curve , where in the middle portion, that is in the month of aug-sep , there was a huge peak , after which the cases are gradually decreasing , which is now representing a stable trend in TamilNadu.
- **as there are 298 data points (days) the width of the bar looks thin.

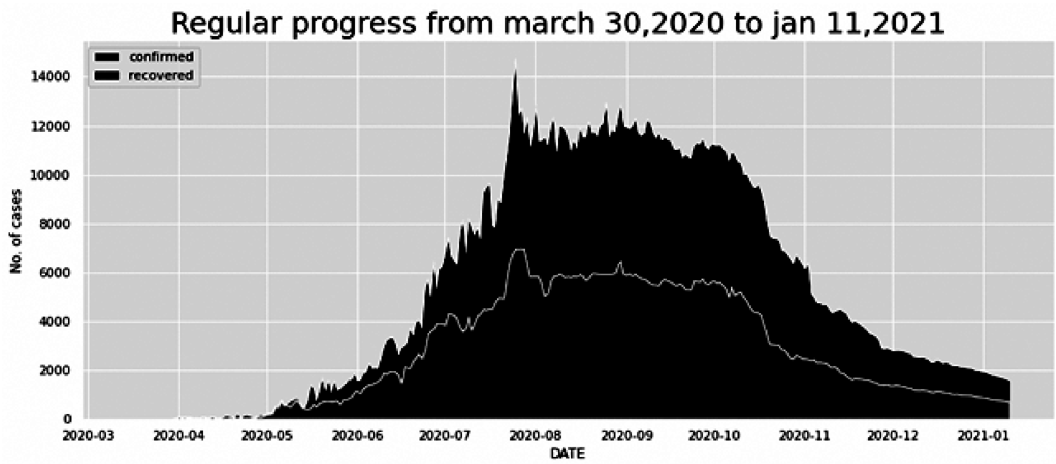
Stackplot

Stackplots are generated by plotting different data sets vertically on top of one another rather than overlapping with one another. The following stack plot gives the visualisation of confirmed and recovered cases.

Code:

```
fig, ax = plt.subplots()
fig.set_size_inches(15, 6);
labels = [“confirmed”,”recovered”]
ax.stackplot(df_tn.index, df_tn.Confirmed, df_tn.Recovered, colors=’tab:gray,k’ , labels =
labels)
plt.xlabel(“DATE”)
plt.ylabel(“No. of cases”)
```

```
ax.legend(loc='upper left')
plt.title("Regular progress from march 30,2020 to jan 11,2021 ",fontsize = 25)
plt.show()
```



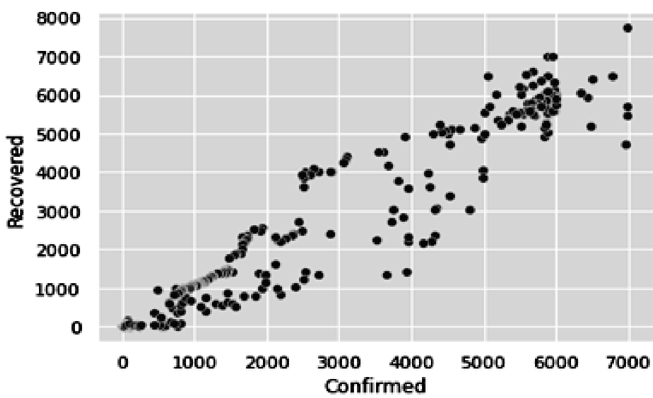
- *this graph gives a clear picture of confirmed and recovered without overlapping.

Scatter Plot

A scatter plot uses dots to represent values for two different numeric variables. The position of each dot on the horizontal and vertical axis indicates values for an individual data point. Scatter plots are used to observe relationships between variables.

Code:

```
sns.scatterplot(x=df_['Confirmed'], y=df_tn['Recovered'], data=df_tn);
```



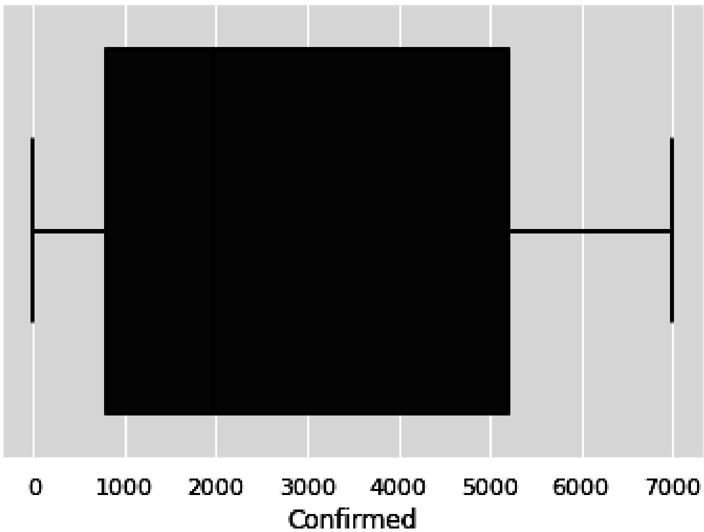
- *This graph clearly shows a positive linear relationship between confirmed cases and recovered cases. That is , in TamilNadu , the recovery rate increases with increase in rate of confirmation of disease.

Box Plot

A box plot is a method for graphically depicting groups of numerical data through their quartiles. The box extends from the Q1 to Q3 quartile values of the data, with a line at the median (Q2). The whiskers extend from the edges of box to show the range of the data.

Code:

```
sns.boxplot(df_tn.Confirmed)
```



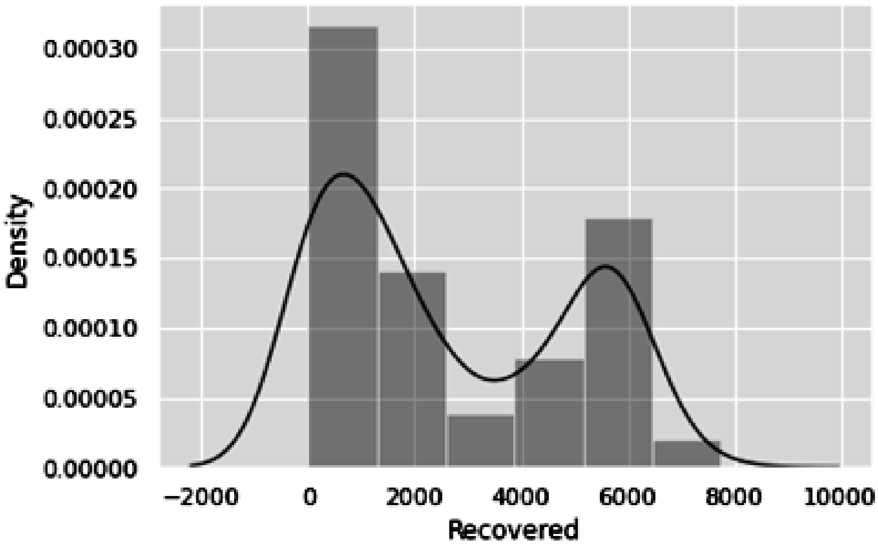
- *this graph shows that the median value lies approximately at 2000 and the active cases range upto of 7000.

Histogram

A Distplot or distribution plot, depicts the variation in the data distribution. Seaborn Distplot represents the overall distribution of continuous data variables. The Seaborn module along with the Matplotlib module is used to depict the distplot with different variations in it.

Code:

sns.distplot(df_tn.Recovered);



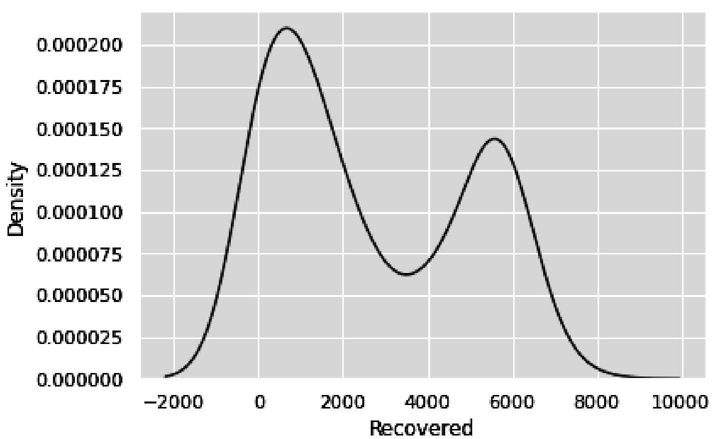
- *this graph depicts the distribution of recovery rate in TamilNadu

Kde Plot

A kernel density estimate (KDE) plot is a method for visualizing the distribution of observations in a dataset, analagous to a histogram.KDE represents the data using a continuous probability density curve in one or more dimensions.

Code:

sns.kdeplot(df_tn.Recovered);



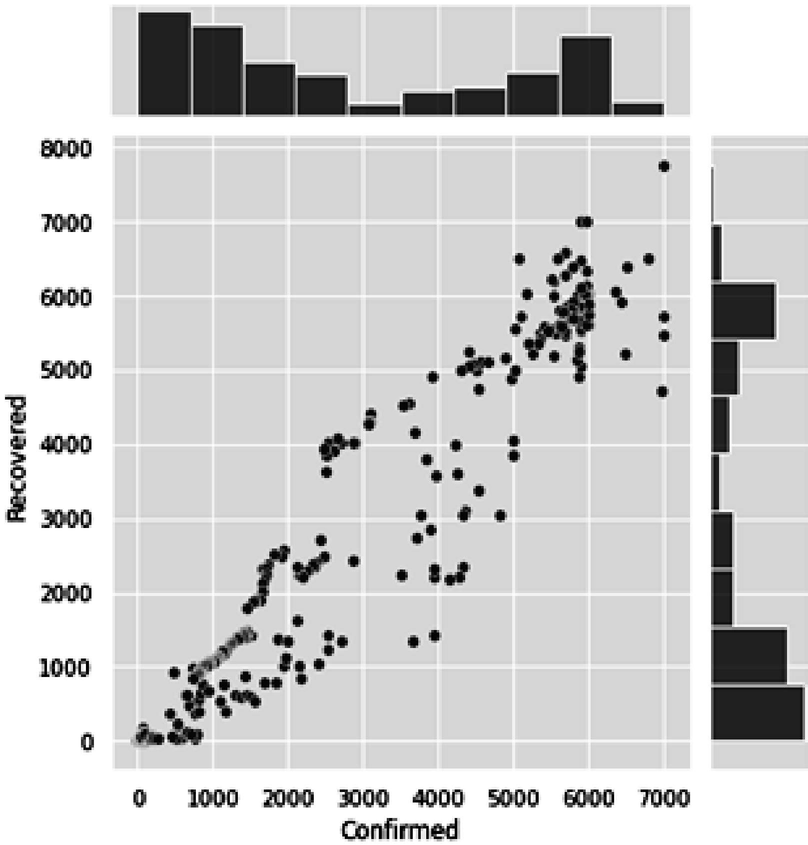
- *this graph depicts the distribution of recovery rate in Tamilnadu with a simple curve.

Joint Plot

Seaborn's jointplot displays a relationship between 2 variables (bivariate) as well as 1D profiles (univariate) in the margins. This plot is a convenience class that wraps JointGrid.

Code:

sns.jointplot(df_tn.Confirmed, df_tn.Recovered, data=df_tn);



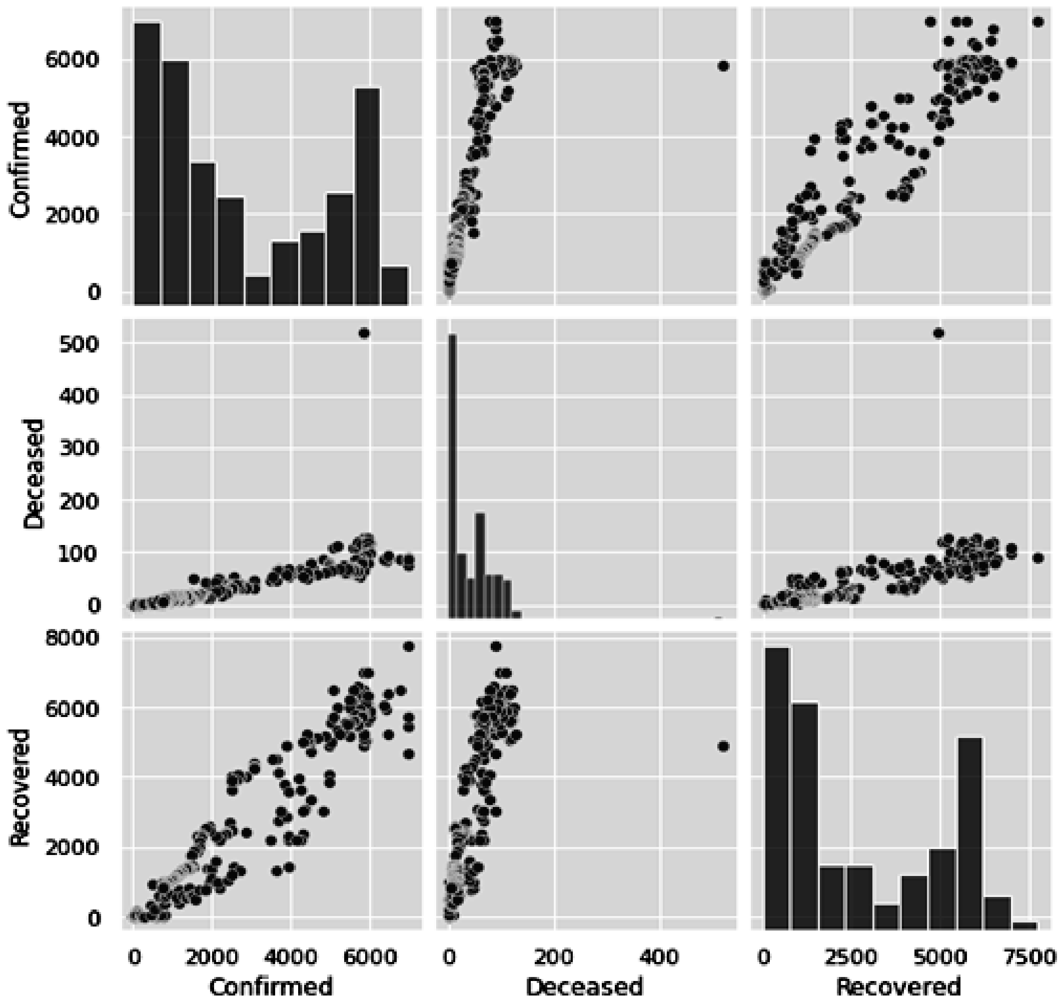
- *this graph shows positive linear relationship between 2 variables -confirmed and recovered cases.

Pair Plot

A pairplot plot a pairwise relationships in a dataset. The pairplot function creates a grid of Axes such that each variable in data will by shared in the y-axis across a single row and in the x-axis across a single column.The pairplot for tamilnadu covid data set is given below;

Code:

```
sns.pairplot(df_tn);
```



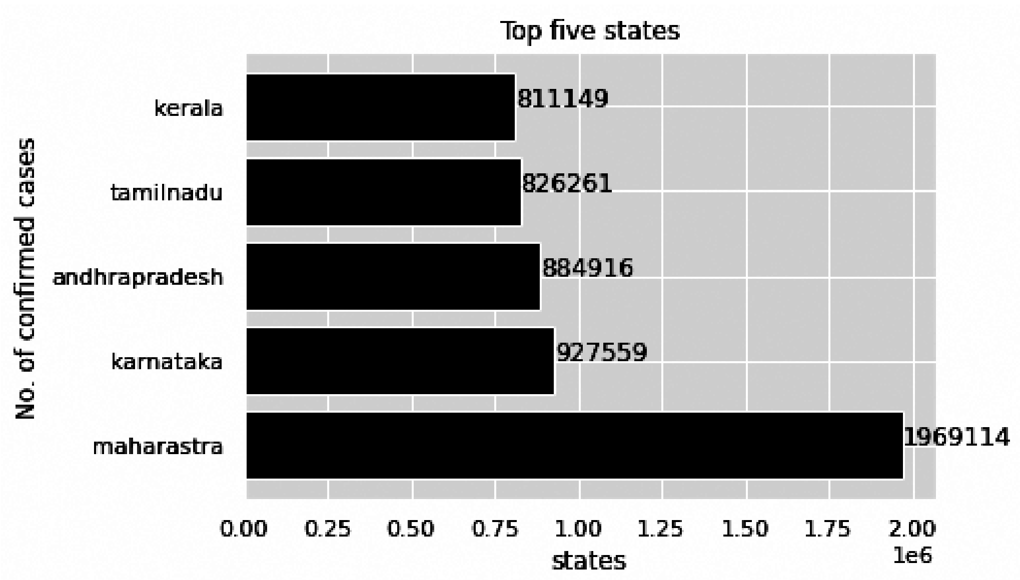
- *this plot explains the realtionships between the variables – confirmed cases , recovered cases and deceased cases.

Top 5 states with maximum cases in India

The top 5 states with maximum confirmed covid – 19 cases , can be precisely represented with the help of bar diagram as follows:

Code:

```
x = [“maharastra”, “karnataka”, “andhrapradesh”, “tamilnadu”,”kerala”]
y = [mhcon,kacon,apcon,tncon,klcon]
plt.barh(x, y , color = ‘k’)
for index, value in enumerate(y):
plt.text(value, index, str(value))
plt.xlabel(“states”)
plt.ylabel(“No. of confirmed cases”)
plt.title(“Top five states”)
plt.show()
```

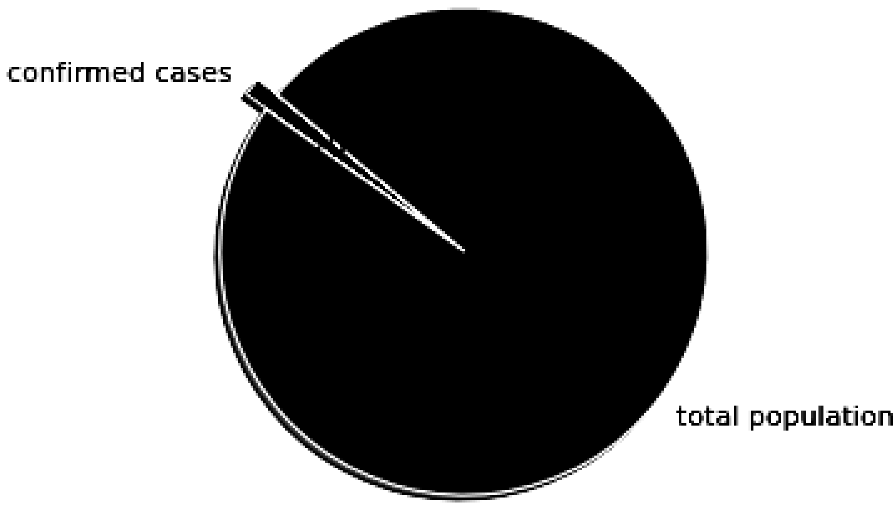


- *this graph clearly shows maharsastra is the top most affected state in India with total cases standing at 19,69,114 .
- **where tamilnadu stands as 4th most affected state with total cases standing at 8,26,261.

Pie Chart

Code:

```
labels = 'confirmed cases', 'total population'
sizes = [ 826261, 67900000]
colors = [ 'k', 'tab:gray']
explode = (0.1, 0)
plt.pie(sizes, explode=explode, labels=labels, colors=colors, autopct='%1.2f%%',shadow=
True, startangle=140)
plt.axis('equal')
plt.show()
```



- *this chart shows that out of total population only 1.20% of population has been tested positive for covid - 19. (approx.).

CONCLUSION

Simplifying your life is the way of the future. For too long we as humans have taken to much work upon our shoulders, it's time to simplify our lives and to use the best tools for the job. Graphing is one of those tools that you just cannot be without. Graphs are used in everyday life, from the local newspaper to the magazine stand. It is one of those skills that you simply cannot do without. Whatever your need or calculation, if used correctly, a graph can help you and make your life simpler. When doing analysis of any kind, we need to make use of structure. This will be done by using a graph. Graphing is used daily. From stockbrokers to performance evaluation in companies. All use them to boost sales and meet deadlines. Even simple calculations can be assessed better by using a graph. What about professional presentations? If you want to be taken seriously in the business world, you need a professional looking presentation. It will boost you and you will be the professional they hire. A chart can take a large variety of forms, however there are common features that provide the chart with its ability to extract meaning from data. Typically the data in a chart is represented graphically, since humans are generally able to infer meaning from pictures more quickly than from text. Text is generally used only to annotate the data. One of the most important uses of text in a graph is the title. A graph's title usually appears above the main graphic and provides a succinct description of what the data in the graph refers to. Dimensions in the data are often displayed on axes. Charts and graphs help to express complex data in a simple format. They can add value to your presentations and meetings, improving the clarity and effectiveness of your message. There are many chart and graph formats to choose from. To select the right type, it's useful to understand how each one is created, and what type of information it is used for. Are you trying to highlight a trend? Do you want to show the overlap of data sets, or display your data as a percentage? When you're clear about the specific type of data that each chart or graph can be used with, you'll be able to choose the one that best supports your point. Graphs are used in everyday life, from the local newspaper to the magazine stand. It is one of those skills that you simply cannot do without. Whatever your need or calculation, if used correctly, a graph can help you and make your life simpler.

REFERENCES

1. The covid – 19 data set of India , dated from march 30 , 2020 to jan 11,2021.
2. Defnitions , code and explanations are referred from different online sources – wikipedia , articles on graphs and charts , stackoverflow coding website.
3. Google colab is used for python programming.

WEBSITES

1. https://api.covid19india.org

A STUDY ON WORKING CAPITAL MANAGEMENT OF LENOVO GROUP LIMITED

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ABSTRACT

Working capital is the amount of funds required for meeting day to day expenses. Net Working capital is calculated as current assets minus current liabilities. Working capital management is described as the administration of all aspects of current assets and current liabilities.

This study is based on the financial statement provided by the Lenovo Group Limited. Lenovo Group Limited, often shortened to Lenovo is a Chinese multinational technology company with headquarters in Beijing. It was found in Beijing in November 1984.

This is a descriptive and analytical study fully based on secondary data published in annual reports of Lenovo Group Limited, journals and research articles. By analyzing the data, it was found that there is a net decrease in the changes of working capital and cash, and cash equivalents for the year 2017-2018 and increases in 2018-2019.The decrease in the changes of working capital is due to increase in current liabilities and decrease in current assets. The decrease in cash and cash equivalents may arise due to more outflows of cash and cash equivalents. This means there is an increase in current assets and decrease in current liabilities.

Keywords: *Working capital, ratio, turnover.*

INTRODUCTION

Working capital is the amount of funds required for meeting day to day expenses. The firm starts with cash. It purchases raw materials, employs workers and spends on expenditure like advertising, salaries, wages etc. Even then it may not receive cash immediately, if sold on credit. The firm will have to use the own cash or fund required to meet out the expenses incurred until it gets back through sales revenue. This is called working capital. Net working capital is calculated as current assets minus current liabilities. If current assets are less than current liabilities, an entity has a working capital deficiency, also called working capital deficit. The management of working capital involves managing inventories, accounts receivable, payable and cash.

Review of Literature

1. **Salla Marttonen, Sari Monto, Timo Karri (2013)** studied "**the profitable working capital management in industrial maintenance companies**". The main objective of this study is to analyze the impact of working capital management on profitability. He used an analytical modeling method. The result reveals that there is a significant negative correlation between the operating working capital and the return on investment.
2. **Tauringana V (2013)** in their study titled on the **"relative importance of working capital management and its components to SMEs' profitability"** with an objective, to report the results of investigation on working capital management. He used regression analysis to test the hypothesis. The result reveals that the management of accounts payable and receivable is important.
3. **Zeeshan Riaz, Naveed Ahmad, Nadeem Iqbal (2014)** in their study on the relationship between working capital management and profitability, with an objective to find out if there is any significant relationship between profitability and capital management. The results reveal profitability and the average collection period. He used a regression method to find out the relationship.
4. **Godfred Adjapong (2016)** in the thesis on **"networking capital, cash flow and performance of UK SMEs"** with an aim to find the influence of cash flow on the relationship between networking capital and firm performance. He used regression analysis to test the hypothesis. The result shows a concave relationship between networking capital and performance in the absence of cash flow.
5. **Nufazil Atlaf and shah (2017)** in their study titled "**working capital management, firm performance and financial constraints**", examined the relationship between working capital management and firm's performance with collected samples from non-commercial firms. The research study is based on the secondary data. It shows that these firms are more financially constrained and have lower optimal working levels.

Research Methodology

Secondary Data

The study is limited to the financial data published in Annual Reports of Lenovo Group Limited. The study is conducted only for a period of three financial years from 2016-2019.

Objectives of the Study

- The main objective of the study is to have an insight into the current practice of the company with regard to management of various elements of working capital.
- To learn how to manage working capital needs of the organization.
- The project will help in gaining the knowledge of effective management, so as to ensure adequate availability of funds.

Limitations of Data

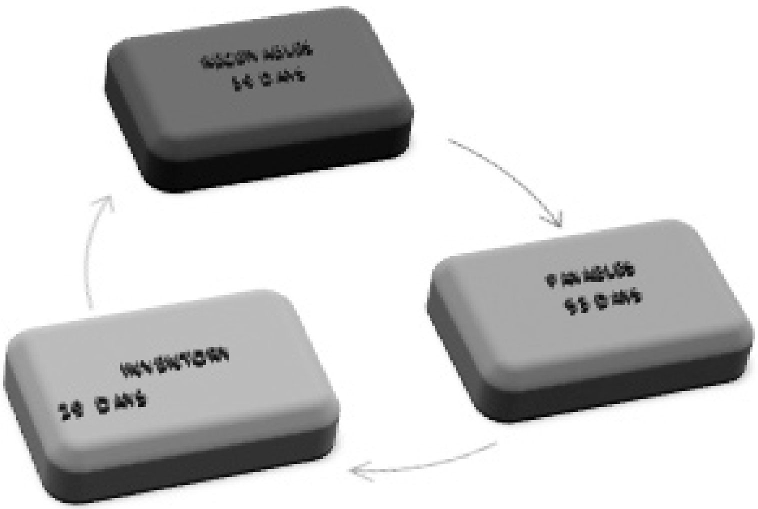
- The study is conducted based on the annual reports published by the company.
- The study is conducted only for a period of three years.

Analysis

Table 1: Operating Cycle

RATIO	YEAR			
	2016-2017	**2017-2018**	**2018-2019**	**AVERAGE**
RECEIVABLE DAYS	38	38	42	39
PAYABLE PERIOD	49	57	54	53
INVENTORY PERIOD	27	31	30	29

Chart 1: Operating Cycle

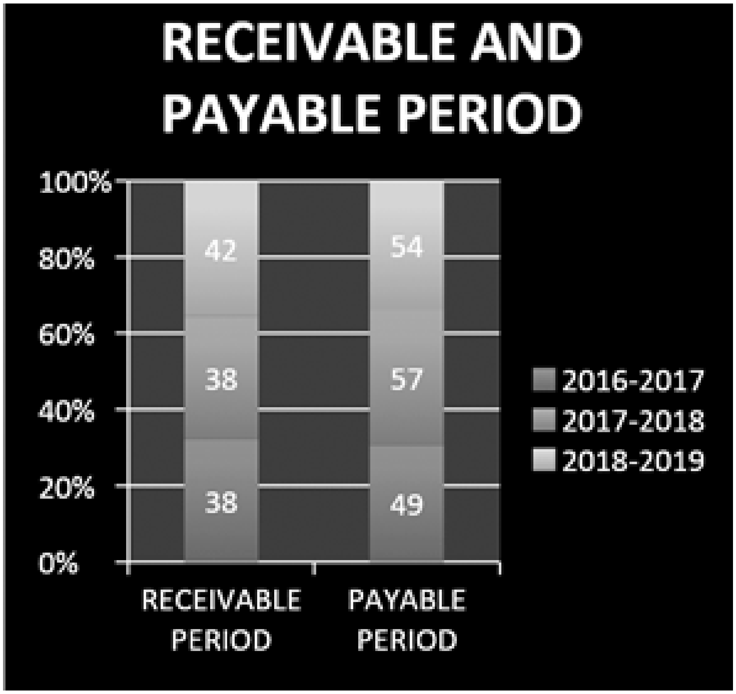


The operating cycle is also called the cash to cash cycle or the net operating cycle or the cash conversion cycle. It is the average period of time required for a business to make an initial outlay of cash to produce goods, sell goods and receive cash from customers in exchange for the goods. The operating cycle is the length of time required for conversion of non-cash assets into cash. It shows that the operating cycle of the company indicates the receivable days of 39 days, payable days of 53 days and inventory 29 days on an average of three years. The debts are collected from the customers within a short period of time in order to avoid doubtful debts.

Table 2: Comparison of Receivable and Payable Period

RATIO	YEAR		
	2016-2017	2017-2018	2018-2019
RECEIVABLE DAYS	38	38	42
PAYABLE PERIOD	49	57	54

Chart 2: Comparison of Receivable and Payable Period



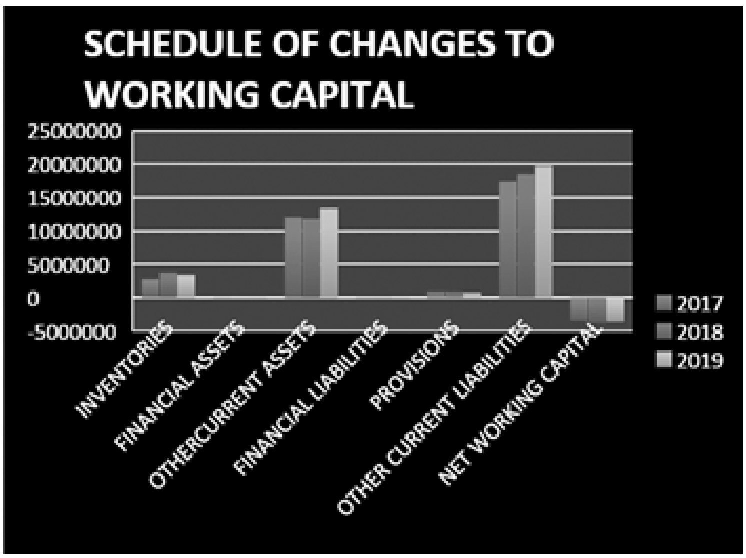
It shows that the company has a growth in the receivable 39 days and payable period 53 days was comparatively higher in the year 2018-2019.

Debtor's receivable period indicates the extent to which the debts have been collected in time. It is very helpful to the lenders because it explains to them whether their borrowers are collecting money within a reasonable time. Creditor's payable period indicates the time taken by the company to pay the bills to its creditors, suppliers and vendors.

Table 3: Schedules of Changes to Working Capital

PARTICULARS	CHANGES		AMOUNT
	INCREASE	DECREASE	
2017-2018			
CURRENT ASSETS	997656	794931	202725
CURRENT LIABILITIES	19521	1145397	1125876
TOTAL	1017177	-1940328	-923151
2018-2019			
CURRENT ASSETS	1579916	357031	1222885
CURRENT LIABILITIES	119787	1150408	-1030621
TOTAL	1699703	1507439	192264

Chart 3: Schedules of Changes to Working Capital



There is a net decrease in the changes of working capital for the year 2017-2018 and increases in 2018-2019.The decrease is due to increase in current liabilities and decrease in current assets.

Findings

- There was a net decrease in the cash and cash equivalents in the year 2017-2018 and an increase in 2018-2019. This may arise due to more outflows of cash and cash equivalents. This means there is an increase in current assets and decrease in current liabilities.
- Operating cycle of the company indicates the receivable days of 39 days, payable days of 53 days and inventory 29 days on an average of three years. The debts are collected from the customers within a short period of time in order to avoid doubtful debts.
- The company has a growth in the receivable and payable period was comparatively higher in the year 2018-2019.
- There is a net decrease in the changes of working capital for the year 2017-2018. This is due to an increase in current liabilities and decrease in current assets.

Suggestions

- To maintain adequate working capital to carry out day to day activities.
- Sales revenue should be increased and stock can be maintained at optimum level.
- Profit can be increased.

CONCLUSION

LENOVO GROUP LIMITED has a well-deserved reputation as the king of productivity. The overall financial status of Lenovo Group Limited is satisfactory compared to the previous year. The company must try to increase the current assets in order to increase the net working capital and also the company must try to improve the working capital requirements in order to meet out the day to day activities. The inventory ratio was fluctuating but compared to the previous year it was increased, this is a good sign for the company. The company must try to reduce the production in order to earn more profits. In Working Capital the direction of change over a period of time is of crucial importance, hence the company must try to carry out the day to day activities with the adequate working capital. They can approach the financial institution to increase the working capital at a minimum rate of interest.

REFERENCES

1. Ahmad, R. (2016). A study of the relationship between liquidity and profitability of standard chartered bank Pakistan: Analysis of financial statement approach. *Global Journal of Management and Business Research*.
2. Malik, M. S., Awais, M., &Khursheed, A. (2016). Impact of liquidity on profitability: A comprehensive case of Pakistan's private banking sector. *International Journal of Economics and Finance*, *8*(3), 69.
3. Omar Abdi Dahir."A Study on Financial Ratio Analysis of Axis Bank."*TMG College of Arts and Science, Manimangalam (2016)*
4. Vijaya Kumar. "Evaluating the financial performance and financial stability of national commercial banks in the UAE." *International Journal of Business and Globalisation* 16.2 (2016): 109-128.
5. K.P.Venugopala Rao, Farha Ibrahim. "Financial Performance Analysis of Banks – A Study of IDBI Bank."*International Journal of Research in IT and Management (IJRIM) Vol. 7, Issue 1, January (2017), pp. 64-72.*

BOOKS

- Financial Management – T.S .Reddy and Y. Hari Prasad Reddy, Margham Publications

WEBSITES

1. https://en.wikipedia.org/wiki/Lenovo
2. www.google.com

AN IMPACT OF ONLINE LEARNING ON STUDENTS DURING THE PANDEMIC

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ABSTRACT

The year 2019 and 2020 ended with a sense that the global economy was in for a turbulent 2021. After the discovery of the Coronavirus (SARS-cov-2) and the spread of COVID-19 have led the government to take tremendous measures. Online education has gain popularity among students in school and students pursuing higher education. Online learning can help the students to takeout some quiet quality time for their studies. With this sudden shift away from the traditional mode of education to online mode in many parts of the world, some are wondering whether the adoption of online learning will continue to post - pandemic, and how such a shift would impact children's emotional well-being.

Keywords: *Educationalsector, Lockdown, Digital Platforms, Online Education.*

INTRODUCTION

After the discovery of the Coronavirus (SARS-cov-2) and the spread of COVID-19 have led the government to take tremendous measures (Lai, C.-C., Shih, and T.-P. R. (2020), So far, 2019-nCoV has affected more than 43 000 patients in 28 countries/regions and has become a major global health concern (https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200211-sitrep-22-ncov.pdf?sfvrsn=6f80d1b9_4). On 11 February 2020, the World Health Organization (WHO) announced a new name for the epidemic disease caused by 2019-nCoV: coronavirus disease (COVID-19). Regarding the virus itself, the International Committee on Taxonomy of Viruses has renamed the previously provisionally named 2019-nCoV as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) An educational sector is providing structure, support, and a system of rewards and penalties to groom its students. Traditional classroom education provides the benefit of face-to-face interactions with peers which are typically moderated by a teacher. It provides children, especially those in their early developmental years, with a stable environment for social interactions, helping them develop skills like boundary setting, Cooperation and empathy.

Online Education For Educators

According to Arwen et al (2020), Sunitha (2020) and Duocet (2020), the impact of learning at home is also felt by parents who also have more burdens because they have to be teachers at home, teach assignments, and always monitor.E-learning education can also be designed to accommodate a variety of learning styles to the students. As educators, it is likely that we will have to put in additional more efforts to incorporate online learning programmes into the curriculum in the most suitable manner. (Aini Indriasih, Sumaji, Badjuri, dan Santoso (2020) .Online training programmes are helping teachers/students/educators advance their skills policy, in curriculum implementation, education systems and leadership, both independently and with the support of their institutions. These programmes can help them develop new skills and capabilities in their students with the help of inter disciplinary and technology approaches.

As the overlap of the classroom mode and online modes of education is becoming more and more inevitable, we owe it to our students to make their education relevant to their future through careful planning, ingenuity, passion to learn.

The Challenges of Online Learning

According to Daryanto (2014), Fadlillah (2014), Keyes(2010), Kunandar (2013) the learning process in educational units is held in an interactive, inspirational, fun, challenging, motivating way for students to participate actively, and provides sufficient space for initiatives. Creativity and independence according to the talents, interests, and physical and psychological development of students. There are, however, challenges to overcome, some students face technology struggle to participate in online learning, without reliable internet access, data packages and few students don't not have instrument like mobile phone, laptop, or desktop. While some schools, colleges and governments have been proving digital equipment to students in need. The effectiveness of online learning varies among different age groups, because of lot of distraction at home while having classes through online.

Objectives of the Paper

- To study the challenges faced by students while learning through online.
- To identify the factors affecting the children while learning through online.
- To know about the effective learning and assessment strategy followed by the schools while studying through online.

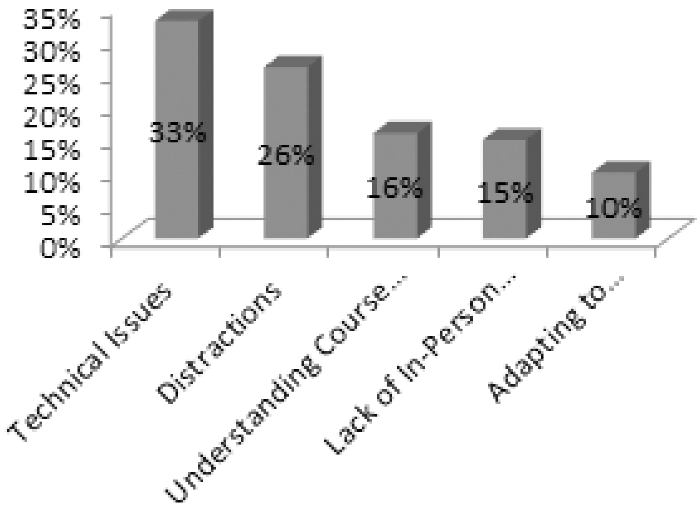
Need for Study

The aim of this study is to analyse the lockdown and impact on online learning in the education sector. The current study will help and provide a clear understanding of the above - discussed concept. The study helps to know about the challenges faced by the student's while learning online, to know about the effectiveness of online learning and the strategies used by the education institution to enhance children during the lockdown.

Research Methodology

A simple study was conducted in order to understand the lockdown and the impact of online learning in educational sectors. The population of the study consisted of students studying in secondary, higher secondary, undergraduate and postgraduate classes belonging to the age group between 8 to 22 years. The Sample size is 50.

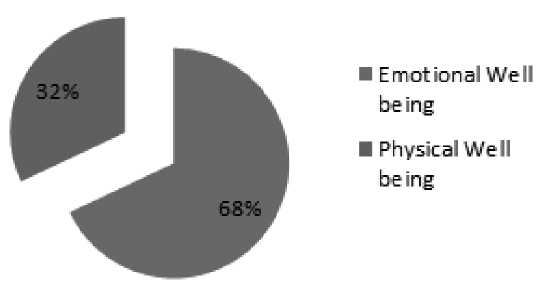
The Challenges Faced by Students while Learning Through Online



Interpretation

It is inferred that from the above table 33% of the respondents said Technical issues is the biggest challenges while learning through online. 26% of the respondents said Distractions,16% of the respondents said understanding the course is difficult while learning through online and 15% of the respondents said Lack of in-person interaction and 10% of the respondents said adapting to unfamiliar tool is the challenge while learning through online.

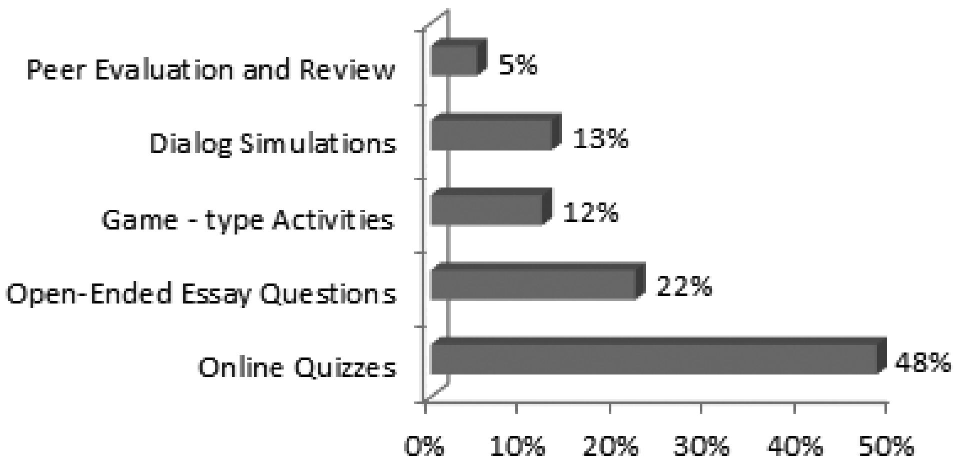
The Factors Affecting the Children while Learning Through Online



Interpretation

It is inferred that from the above table 32% of the respondents said Emotional well-being is the factors affecting the children while learning through online and 68% of the respondents said Physical well-being is the factors affecting the children while learning through online.

The Effective Learning and Assessment Strategy Followed by the Schools While Studying Through Online



Interpretation

It is inferred that from the above table 48% of the respondents said online quizzes is the effective learning and assessment strategy followed by the schools while studying through online 22% of the respondents said Open-Ended Essay questions,12% of the respondents said game- type activities and 13% of the respondents said Dialog simulations and 5% of the respondents said Peer Evaluation and review is the effective learning and assessment strategy followed by the schools while studying through online.

Suggested Awareness

- Online learning can make education more convenient and accessible for students, but it's not without its challenges. Most of the students felt that there is a lack of in-person interaction, technical issues and distractions this can be avoided by continuing motivation and encouragement from schools.

- Teachers can use video chat rather than basic instant messages when interacting with students. The students should involve by initiating from the beginning of the discussions in the discussion board, and then contributing rapid, regular, and open responses to questions.

CONCLUSION

COVID-19 has impacted a lot to the educational sector. There are lots of challenges faced by the students in online learning various opportunities are their Children can make maximum utilization of online platforms, the effectiveness of online learning tools in facilitating students' learning and the learners learning outcomes are measured in many dimensions. Teachers can use video chat rather than basic instant messages when interacting with students. The students should involve by initiating from the beginning of the discussions in the discussion board, and then contributing rapid, regular, and open responses to questions.

REFERENCES

1. Daryanto. (2014). Pendekatan pembelajaran saintifik Kurikulum2013. Yogyakarta: Gava Media.
2. Lai, C.-C., Shih, T.-P., Ko, W.-C., Tang, H.-J., & Hsueh, P.- R. (2020). Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease2019 (COVID-19): The epidemic and the challenges. International Journal of Antimicrobial Agents, 55 (3), 1–9.
3. Aini Indriasih, Sumaji, Badjuri, dan Santoso (2020) PENGEMBANGAN E-COMIC SEBAGAI MEDIA PEMBELAJARAN UNTUK MENINGKATKAN KECAKAPAN ANAK.REFLEKSI EDUKATIKA: Journal Ilmiah Kependidikan, Volume 10, Nomor 2, June 2020, hlm. 154-162
4. Dziuban, C., Hartman, J., Cavanagh, T. Moskal, P., 2011. "Blended Courses as Drivers of Implementation, pp. 17-37
5. Bacow, L. (2020). COVID-19 – Moving classes online, other updates. [Community Message]. Harvard University..
6. Dewi, W. A. F. (2020). Dampak Covid-19 terhadap implements pembelajaran daring di Sekolah Dasar. Edukatif: Jurnal Ilmu Pendidikan, 2(1), 55-61.

WEBSITES

1. https://doi.org/10.1016/j.ijantimicag.2020.105924.
2. https://www.harvard.edu/covid-19- moving-classes-online-other-updates.

FRAUD DETECTION IN ONLINE TRANSACTIONS USING MACHINE LEARNING TECHNIQUES: A SURVEY

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ABSTRACT

In the scientific world, the technologies are developing fast as much as the abuses of the technologies also happens more. In online transactions and payments many fraudulent activities occur and causes high financial losses for both the individual and the industry. In the internet era online transactions are increased enormously in day-to-day life. So, the fraud events in online transactions is a growing problem and results in huge economical losses. Hence financial companies and banks focuses more on fraud detection algorithms. In this article three different topics has been discussed. First, we focused on four main fraud occasions in real world transactions. Second, we discussed the real-time credit card fraud detection models and finally the realistic comparison of the monetary gains and losses due to fraud detection models has been proposed. The data used from a financial company according to the confidential disclosure agreement. This paper also summarised and compared the detection of fraud events using some effective machine learning techniques such as ***Random forests, Peer Group Analysis(PGA), Break Point Analysis, Bayesian Network Classifiers, Artificial Neural Networks(ANN), Bayesian Belief Networks(BBN)****. These are the most prominent machine learning techniques which is also used to decrease the fraudulent cases.*

Keywords: *Fraud detection, Machine learning, Credit card, Data mining, Skewed Distribution, Bayesian Decision Theory.*

INTRODUCTION

Fraud has been increasing drastically with the progression of state-of-art technology and the worldwide communication (D.S.Sisodia et.al,2017). Fraud can be avoided in two main ways: Prevention and Detection. Recently card-not-present transactions (G.Liu, 2018) in credit card operations have become popular among internet payment gateways. The two types of frauds are identified in online transactions are Card-Not-Present (CNP) frauds and Card-Present (CP) frauds. In this article the four types of fraud events that belongs to CNP fraud has been discussed.

The Machine learning techniques Supervised and Unsupervised category are used to analyze the two kinds of data such as Categorical and Numerical. The categorical data can also be transformed into numerical data and then the appropriate machine learning techniques are applied and finding the best optimal algorithm to detect the fraudulent events.

In the recent fraudulent databases consist of higher percentage of fraudulent cases. But Financial institutions and Banks use only simple rule classification model for the credit card fraud detection. These rules perform well as long as there are no new fraud patterns occur. Therefore, a new better approach has to be formulated to identify the fraudulent pattern. This kind of practice is known as under-sampling procedure (J.V.Hulse et.al,2007) and it includes the real financial costs of credit card fraud detection and this method decreased the cost significantly than the state-of-art techniques.

Machine Learning Techniques

The fraudulent activity happens only when the fraudsters get the details of the original person or by misusing the credit cards. The fraudulent activities can be identified by using the different transactions occur in the whole data. The process of fraud detection takes the whole data of the transaction details and identify the sudden change in the data of the customer which shows the wrong activity. The analysis of huge data can be handled by the use of the machine learning techniques which is more effective among all the traditional techniques. The mostly mentioned machine learning methods used to identify the fraud activity are **Random forests, Bayesian network classifiers, Artificial Neural Network (ANN), Bayesian Belief Network (BBN)** and the unsupervised method used is **Peer group analysis (PGA), Break point analysis.**

Random forest is a most prominently using supervised learning method for both classification and regression. It uses decision trees and their particular nodes to find out the mean of the class labels. The **Bayesian network classifier** represents the given data in the graphical model, it is used to classify the relationship between the classes present in the data set. **Artificial Neural Network (ANN)** is a part of artificial intelligence, it can solve the problems easily which is difficult manually. **Bayesian Belief Network (BBN)** is a statistical model to find the misbehaviour of the data. **Peer Group analysis (PGA)** is an unsupervised learning model which compares all objects to find the occurrences of fraud activity, **Break point analysis** gives a related prediction by comparing the old and new transactions.

Challenges in Datasets

To implement various machine learning techniques, real data is required. But the real data are lacking because of the data sensitivity and privacy issues. This result leads to imbalanced data or skewed distribution of data. The under-sampling procedure is used to get the datasets with higher fraud detection ratios and also applied for training the datasets.

Problems in Big Data

The fraudulent data exactly looks like a legitimate data. So, the data mining techniques take huge amount of time to execute when dealing with big data. Due to overlapping of data, the problem is selecting the detection algorithms and the feature selection and also the detection cost and lack of adaptability in the fraud detection process. Hence the machine learning models are applied to handle the challenging issues in the datasets.

DATA ANALYSIS

The raw data is collected and it undergoes various steps to be analyzed. The steps are making the data description, data preparation and how the data has to be arranged in datasets, data cleaning, data integration, data transformation, data reduction, resampling techniques, modeling and testing. Then the techniques for real-time fraud detection system is implemented.

Fraud Detection System

Real time detection is used to find the fraudulent transactions at the exact time the fraud happens. The real time fraud detection system consists of three main units: API MODULE, FRAUD DETECTION MODELS AND DATA WAREHOUSE. API MODULE is responsible for transferring real-time transactions, DATA WAREHOUSE is used for storing the live transactions. The user interacts with the fraud detection system by the GUI.

The Fraud detection models is a cost-effective and uses the derived datasets. The derived attributes are used to know the spending behavior of the customer. It includes the purchasing pattern, transactions during a particular time, transaction type, merchant group and the total amount spent. The steps involved in analysing the data using various models such as Bayesian Minimum Risk Classifier, Thresholding Optimization, Classification of minimum risk using Bayesian model, Bayesian Minimum Risk Classifier with adjusted probabilities and the sensibility of all parameters.

Fraud Detection Models

Total loss for e-commerce methods in north America is $3.5bi in 2012 (Alejandro Correa Bahnsen et.al,2012) includes the data mining based detection system using machine learning (mainly supervised learning methods). It combines both the manual and automatic methods to give an optimal solution. This is differentiated in three ways: credit-card transaction, credit application and telecommunication. The fraudster ratio is calculated by dividing the total orders with fraudulent orders. Then the fraudster is analysed based on the existing data with the current data. Finally, the legitimate customers are identified automatically using machine learning techniuqes. They explored the automatic classifier with manual revision and also they used the random forest method, cross validation, support vector machines, logistic regression. Among these all methods, random forest method gives high performance than other models.

Peer Group Analysis (PGA)

It is an unsupervised learning method to find the data which is deviated from other data. Basically, the frauds are divided into Behavourial frauds and Application fraud (Nuno Carneiro et.al , 2018). Behavourial fraud are frauds who used only details of the credit card and the application frauds used the new issued credit cards. This technique compares all the object with one target object and then calculate the peer group statistics. It is also used to detect the outlier and the local anomalies.

BREAK POINT ANALYSIS

Now-a-days we are using the more online transactions and it includes the high risks. In the field of sales and e-commerce transactions, only the credit card details are required for the online payments or transactions. It analyses the longitudinal data which means the whole data transactions are occurred overtime. So, the whole dataset of the field is used to find out the fraud activity easily. It has a window for the observation of transaction at a time. Whenever the transaction occurs, the existing record is removed and the new record is added. For every transaction it compares the existing with the new transaction. The main advantage of the method is the balanced data is not required.

Bayesian Network Classifier

Using the machine learning and the data mining techniques are the most prominent to counter the fraud detection. The Bayesian network classifiers are namely K2, Tree augmented naive bayes (TAN), naive bayes, logistic and J48 classifiers (Richard J et.al,2001). The most powerful machine learning tool WEKA is used to measure the performance of the classifiers. They can differentiate the data as TP (True Positive), TN (True Negative), FP (False Positive), FN (False Negative). The data which falls under the FN category is marked as fraud. The two types of dataset are used such as dummy dataset and new transformed dataset. In the transformed dataset, data is normalised using the principal component analysis technique. The classifiers provide best results in the new dataset when compared to dummy dataset (Richard J et.al,2001).

Neural Networks: The automated credit card fraud detection is achieved effectively by the two kinds of neural networks such as Artificial Neural Network (ANN) and Bayesian Belief Network (BBN). In ANN, Feed forward multi-layer perception and the different layers of preceptors are interconnected. The ANN has three layers such as input layer, hidden layer and output layer (Sam Maes et.al, 2015). The input layer receives the input from the database or device, the hidden layer receives the input from the input layer and the output layer provides the final output. Every iteration has 2 passes: Forward pass and Backward pass(Sam Maes et.al, 2015). The Bayesian Belief Network (BBN) has the set of variables and states which has links and arrows connects pairs of nodes. STAGE algorithm is also used to receive high scoring results and the BBN gives faster and better results when compared to ANN.

Discussion

The below table represents the description of the articles that we analysed and presented in this article.

Name of the Article	Name of the Authors	Year	Algorithms Used
Real-time Credit Card Fraud Detection Using Machine Learning	1. AnuruddhaThennakoon, 2. Chee Bhagyani, 3. Sasitha Premadasa, 4. ShalithaMihiranga, 5. NuwanKuruwitaarachchi .	2013	• Logistic Regression • Support vector machine • Naïve bayes • K-Nearest Neighbour
Cost Sensitive Credit Card Fraud Detection using Bayes Minimum Risk	1. Alejandro Correa Bahnsen, 2. Aleksandar Stojanovic, 3. DjamilaAouada, 4. Bjorn Ottersten .	-	• Bayes Minimum Risk Classifier
A data mining based system for credit-card fraud detection in e-tail	1. Nuno Carneiro, 2. Gon alo Figueira	2019	• Cross validation • Random Forests • Support vector machines • Logistic regression
Unsupervised Profiling Methods for Fraud Detection	1. Richard J. Bolton 2. David J. Hand	2001	• Peer Group Analysis • Break Point Analysis
Credit card Fraud Detection using Neural Networks	1. Sam Maes 2. Karl Tuyls 3. Bram Vanschoenwinkel 4. Bernard Manderick	2015	• Bayesian network classifiers
Credit Card Fraud Detection Using Machine Learning As Data Mining Technique	1. Ong Shu Yee 2. Saravanan Sagadevan 3. Nurul Hashimah Ahamed Hassain Malim	2018	• Artificial Neural Network • Bayesian Belief Network

CONCLUSION & FUTURE WORK

Credit card Fraud detection has been a keen area in the research field because of continuous change in the fraud pattern. In this article the machine learning models that captured the four fraud patterns (Risky MCC, Unknown web address, ISO-Response Code, Transaction above 100$) with the highest accuracy rates are LR (74%), NB (83%), KNN (72%), Bayesian Network Classifiers (95%) and SVM (91%) accuracy rates. For the cost-effective credit card fraud detection, the proposed matrix with the real financial cost very good results were found. When adjusting the estimated probabilities before applying the Bayes Minimum Risk to the RF (Random Forest), the best results in terms of costs are found. The Bayes Minimum Risk Classifier gives much better fraud detection results in the sense of higher savings. The cost savings range to 23% in comparison with RF. In future extension the aim is to focus on the location-based frauds.

REFERENCES

1. S.Xuan, G.Liu, Z.Li, L.Zheng, S.Wang, and G.N.Surname, “Random Forest for credit card fraud”, 15thInt.Conf.Networking, Sens.Control, 2018.
2. D.S.Sisodia, N.K.Reddy, and S.Bhandari, “Performance Evaluation of Class Balancing Techniques for credit card fraud detection”, IEEE Int.Conf.Power, Control.SignalsInstrum. Eng., pp. 2747-2752, 2017.
3. G.Liu, W.Luan, Z.li, and Y.Zhang, “ A new FDS for credit card fraud detection based on behavior certificate”, 2018.
4. J.V.Hulse and T.M.Khoshgoftaar, “Experimental Perspectives on Learning from Imbalanced Data”, in International Conference on Machine Learning, 2007.
5. Anuruddha Thennakoon, Chee Bhagyani, Sasitha Premadasa, ShalithaMihiranga and NuwanKuruwitaarachchi ,“Real-time Credit Card Fraud Detection Using Machine Learning”, 2013.
6. Alejandro Correa Bahnsen, Aleksandar Stojanovic, DjamilaAouada, Bjorn Ottersten, “Cost Sensitive Credit Card Fraud Detection using Bayes Minimum Risk”, 2012.
7. Nuno Carneiro and Gon alo Figueira, “A data mining based system for credit-card fraud detection in e-tail”, 2019.
8. Richard J. Bolton and David J. Hand, “Unsupervised Profiling Methods for Fraud Detection”, 2001.
9. Sam Maes, Karl Tuyls, Bram Vanschoenwinkel, ” Credit card Fraud Detection using Neural Networks”, 2015.
10. Ong Shu Yee, Saravanan Sagadevan and Nurul Hashimah Ahamed Hassain Malim,” Credit Card Fraud Detection Using Machine Learning As Data Mining Technique”, 2018..

YOUTH ENTREPRENEURSHIP

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ABSTRACT

Students are often prone to become a job seeker rather than a job provider. An increase in the rate of unemployment amongst the talented, energetic and well educated youth has directed students to think of the term Entrepreneurship mainly "Youth Entrepreneurship". Youth Entrepreneurship has become important in present context as the employment prospects are changing due to pandemic situation affecting employment. Youth Entrepreneurship gives strength among every youth to stimulate their inner confidence and potential to earn for their own living, apart from offering employment.

Keywords: *Entrepreneurship, Employment, Innovation.*

INTRODUCTION

Over the past few years young entrepreneurs invaded new domains and created their own empires. Be it health care, retail, logistics or brand building, youngsters are making their mark in every field. Ideas might be the most commonly encountered of entities for the mind but entrepreneurship does not come as easy to all. A clear vision and an even clearer focus are the most important elements that can make successful entrepreneurs out of starry eyed dreamers. Because passion does not stem at any age as there is no specifications as to whatsoever to emerge as enterprising minds rather that can make it matter. Fueling their desires and translating them into reality is what which makes good entrepreneurs.

Need for Young Entrepreneurs

The job satisfaction and life-satisfaction of young entrepreneurs are all higher than workers of identical personal characteristics. Self-employment brings direct microeconomic benefits to people. A large new supply of young entrepreneurs can solve job crisis. Young Entrepreneurship improves the innovative thinking capacity of a person. Creation of new jobs is also possible as there is a possibility to raise their competition in the market. As the number of new young entrepreneurs increases, the employment among the fellow youths also rise; leading to higher degree of competition among the firms. And this directly benefits the consumers in many ways. Young entrepreneurs are more adaptive to the newer trends and are also flexible. We are in twenty first century and this is the perfect time for young people to start their own enterprises as markets have been liberalized and diversified more widely.

Economic Development

Young entrepreneurs have always secured or created a unique position for them both in life and employment. Entrepreneurship, is in fact, regarded as an efficient tool to boost the economic development of our country. It acts as a catalyst for social transformation and works for common well-being. Young Indians recognize entrepreneurship as a key element of transformation of India heading into the next decade of growth. This would not only create value in terms of economic wealth, but also be a trigger for job creation and is a path that is needed for solving the myriad challenges that prevent India from reaching its potential. Young Entrepreneurs exhibit creativity and innovation in their field of work which ultimately contribute towards the economic growth of the country and bring about a level of changes in the society. By dismantling monopolies, creating new demands, and tackling old problems with new technology, young entrepreneurs prove to foster more competitive economies and are enablers of shared prosperity, while adapting more rapidly to ever more globalized societies. Regardless of the language, level of education or nationality, young people see entrepreneurship as a means to achieve social and economic development by succeeding with the start-ups, create jobs, and thus to have a significant impact in our home countries.

Government Schemes for Entrepreneurial Development

Launching schemes with attractive tag-lines like Start up India seemed a perfect start for a happy economy. The Government of India has undertaken several initiatives and instituted policy measures to foster a culture of innovation and entrepreneurship in our country. Job creation is a foremost challenge faced by India; But in this fast developing world people are provided with multiple schemes and incentives to ensure that they enter into the entrepreneurial venture. In sectors like, Agriculture, Chemicals and Fertilizers, Finance, Commerce and Industry, Communication and Information Technology, Corporate Affairs, Culture, Food Processing, Housing and Urban Alleviation, and Science and Technology various programs and policies have been instituted . Financial assistance, insurance, subsidy, training, business loans, special incentives etc., are also provided for the Young entrepreneurs and Start-up companies. Some of the important Government measures aimed at promoting young entrepreneurship are

1. Start-up India
2. Atal Innovation Mission (AIM)
3. Pradhan Mantri Kaushal Vikas Yojna (PMKVY)
4. Digital India
5. Jan Dhan-Aadhar-Mobile (JAM)
6. Dairy Entrepreneurship Development Scheme

7. Atal Incubation Centers (AIC)
8. New Entrepreneur cum Enterprise Development Scheme
9. The Venture Capital Assistance Scheme (VCA)
10. NewGen Innovation and Entrepreneurship Development Centre (NewGen IEDC)

Impacts of COVID 19 on Entrepreneurial Development

With great uncertainties, comes greater amount of responsibilities. A crisis creates entrepreneurial opportunities especially when it coincides with technological revolution. The way entrepreneurial business models and approaches are affected by the pandemic, will have an impact on how entrepreneurship is perceived as a job choice in the future. As the number of cases of Novel Corona Virus increased, there has also been an increase in the number of new young entrepreneurs in India. From organizers of music festivals overseeing pop-up morgues to automotive companies pivoting manufacturing to much-needed ventilators, there has been a surge in creativity. Finding opportunities amid the crisis; agility is crucial. Young entrepreneurs and start-ups have been more opportunistic during the pandemic, turning on their businesses through some kind of "repurposing" and redirecting existing knowledge, skills, people and networks to new needs that have emerged. A repurposing approach is not without its challenges. Many of the entrepreneurs come from different knowledge domains and this poses a problem for those wanting to do business with them and it is difficult to judge their trustworthiness or legitimacy without a past reputation in that domain

Challenges to be Faced

Creating an own kingdom of business are not without hardships. When it comes to young entrepreneurs, the path is even more drastic. However, identification and being aware of certain strategies would gift us with success.

Financial Issues

The foremost challenge which every creative young mind face is to fund their business. Past reputation, trust worthiness and good credit history will make existing business firms to crack this barrier. Whereas, due to limited availability of funds it could take upto two years of business for a young entrepreneur to earn money. Expanding the business under these circumstances is absolutely possible if there is a well-prepared business plan.

Facing Age Stereotypes

Ironically, youngsters are stated as an immature and a person with lethargic attitude. But if they behave professionally and have confidence on their own abilities and treat others fairly, it would help them in gaining reputation and would be respected by elders. Two little kids from Tamil Nadu, namely Shravan Kumaran and Sanjay Kumaran cofounded a company called "Go Dimensions" at their early age of 10 and are now successful entrepreneurs. This shows that Age is just a number when self-confidence and perseverance are instilled in one's mind.

Facing criticism

While running a business, criticism about business failures may arise. But in reality, many feel jealous about young entrepreneurs who are independent. They try to magnify the negatives by projecting one's insecurity on young entrepreneurs. Always have a positive mind and keep improving more qualitatively by paving a way to success.

Hiring employees for the first time

Finding employees for the business could be a hectic task for a youngster since there must be an exact match between the skills of an employee and works provided to him. The amount of trust which a common man have on a young entrepreneur is also less. Thus, even, the right employee for a particular task may be neglecting to do the work. Talented people migrate to cities and hence finding right employees may be difficult

Finding Customers

A smaller company will find it difficult to attract customers as the number of established and reputed companies are generally higher in number. Hence, the mindset of people need to be examined, thereby selecting correct target market in finding and reaching customers. Also, Young entrepreneurs should ensure the quality of the product/service provided to attract customers. Customer satisfaction is essential to increase repetitive sales.

CONCLUSION

Challenges are part of life; as every road doesn't lead us, as smooth as a highway. We need to be prepared to bypass them easily. Perseverance and enthusiasm go a long way to smooth the route to success. Patience and attitude upbeat would help in building a long and fruitful career as an independent business owner. This spirit of entrepreneurship should keep growing and inspire the youth in India and also across the globe.

WEBSITES

1. Timesofindia.indiatimes.com on National entrepreneurship
2. https://www.youngindians.net/entrepreneurship
3. https://www.innfinity.in/limitless/young-entrepreneurs-in-india/
4. www.sciencedirect.com
5. Yesconnect.in – Young Entrepreneurship School (YES)
6. https://www.skillsyouneed.com/rhubarb/young-entrepreneur-challenges.html
7. https://www.samworkshops.com/blog/5-young-indian-entrepreneurs
8. https://slideplayer.com/slide/13101063/
9. https://www.managementstudyguide.com/youth-entrepreneurship.html
10. https://www.unicef.org/media/72406/file/Youth-entrepreneurship-concepts-and-evidence-issue-brief-2019.pdf

AUTOMATIC CAR PARKING SYSTEM USING ARDUINO

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ABSTRACT

The aim of the project is to reduce the traffic in the parking areas and also to minimize the human interaction. The automatic car parking system allows only n number of cars. We have used Arduino UNO to operate the IR sensors and the connections. IR Sensors will sense the car and allow the car to enter/exit the parking area. If the slots are full, it will be detected by sensors which are placed in the parking slots then the sensors won't allow the car to be entered and the entry gate to be opened. We are facing a lot of traffic problem in parking areas and it can be reduced by using this mechanism.

Keywords: *Arduino UNO, IR sensors, Servo Motors, Arduino Application.*

INTRODUCTION

In this era internet of things (iot) plays an important role in solving day to day problems. Internet of things gives us many ways to solve the problems and also develop the world smarter. We can see in many places the vehicles are not properly parked in parking areas and people cannot know whether there are empty slots in the parking area. This creates more traffic and also accidents because of improper parking. People are wasting their valuable time in searching of empty parking slots. This project, automatic car parking system solves all these problems. By implementing this system, we can park the vehicles in proper order in the parking area and also solves the problem of unnecessary time consumption in finding parking spots in commercial car park areas like malls theatres etc.

Literature Survey

Various methods are used and developed by many people for this project. One of the papers proposed a system using RFID (radio frequency identification) monitoring and also an application for determine the free slots. In their paper they determined the car parking area near to the user. If the parking slots are full it will guide the user to next nearest area (Sunil et.al, 2017).

Another paper proposed a system based on client-server architecture. Here the user can per book their parking slot by giving their name and vehicle number in their application. The server books the parking slot and gives a particular time for the user to park their vehicle. If the user does not reach the place in the particular time the server removes the reservation slot (Uma Maheswari et.al,2020) . One of the parking systems use image processing for deduction of free slots in parking areas. Here a brown rounded image on parking slot is captured to deduct the free slots and displayed the information in 7-segment display (Pham et.al, 2015). Smart Parking system proposed a mechanical model with an image processing facility. The car would be parked with the use of lift at multiple levels and image processing is used to capture the number plate and store in database for comparison to avoid illegal car entry. Thus, in this paper a car parking system is proposed that is a fully automated model with minimum human intervention (L. Yu et.al, 2015). Another paper they have discuss about FPGA technology and how to implement with this system. here they access in the parking which is made by barrier, if there are vacancies with the lifting of the barrier a ticket is issued with a client code and there starts a timer for measuring the time left in the parking. To work with FPGA Xilinx software has to be used (R.Khan et.al,2013). A vision-based car parking system is developed which uses two types of images (positive and negative) to detect free parking slot. In this method, the object classifier detects the required object within the input. Positive images contain the images of cars from various angles. Negative images do not contain any cars in them. The co-ordinates of parking lots specified are used as input to detect the presence of cars in the region. However, limitations may occur with this system with respect to the type of camera used. Also, the co-ordinate system used selects specific parking locations and thus camera has to be at a fixed location. Limited set of positive and negative images may impose limitations on the system (J. P. Benson ,2006).

Methodology

IR Sensors are used to check the availability of the slot. Added one sensor on the entrance, exit and others on each slot. When a car arrives, it checks for the empty slots and then opens the gate. If there is no empty slot available then the gate will not open. We have used Arduino source code to operate the Arduino chip. When a car Enter or Exits, the IR sensor sends signal to Arduino and Arduino triggers the particular servo motor which we use for entry and exit gates will open or close according to entry or exit of car. we use LEDs to represents the empty slots. When the LED is on it represents the empty slots. When any one parks the car the IR sensor in the Parking slot sends signal to Arduino and Arduino sends low or 0 signal to that particular LED and the LED goes off. When all the slots are full the gate will not be open.

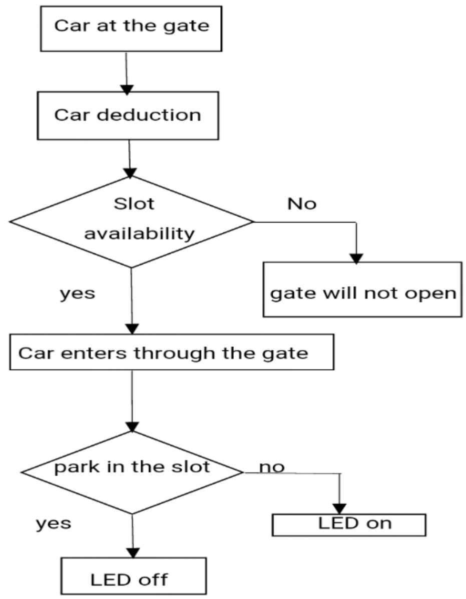

Figure 1: Block Diagram of Automatic car Parking System

When the car tries to pass through the gate, the sensors will detect the car and checks the availability of the slots. If any slots are available, then the gate will be opened and allows the car to be parked. Else it won't allows the car to be entered. When the slots are free the led will be in on state and if any car parked in a particular slot then the led goes off.

Hardware Components

The hardware component required are Arduino uno, IR sensors, servo motors, breadboard, jumper wires and LEDs.

Arduino uno

The Arduino uno is a microcontroller board based on the ATmega328p. It has 14 digital input and output pins. Out of 14 digital pins 6 can be used as PWM outputs. It has 6 analog input, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. The Arduino uno is programmed using Arduino software (IDE).

IR Sensors

An infrared (IR) sensor is an electronic device that measures and deducts infrared radiation in its surrounding environment. When an object comes close to the sensor, the infrared light from the LED reflects off of the object and is deducted by the receiver. Here we use IR sensors in all the slots and entry/exit to deduct the vehicles.

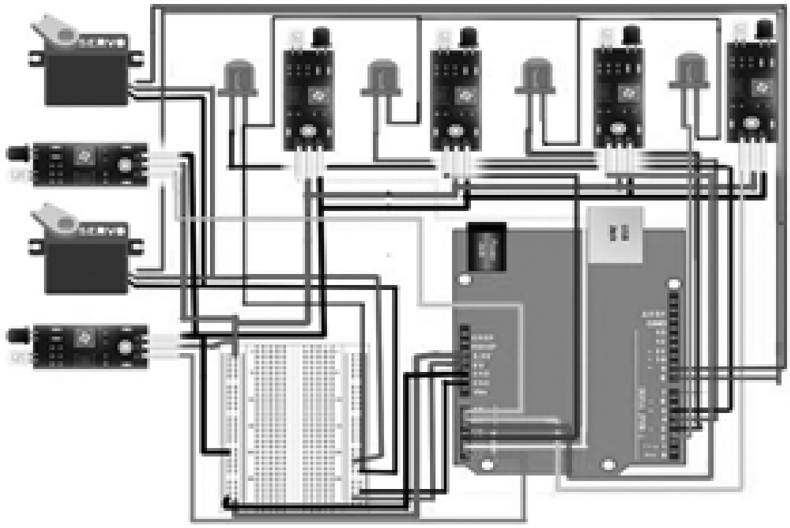

Figure 2: Circuit Diagram

Source: http://www.mediafire.com/file/o7csmmmrd7y5pdr/Parking_.jpg

CONCLUSION

The aim of the project is to reduce the traffic which the whole world is facing frequently in parking area. By using the above methodology, we can able to achieve the aim of the project. This helps people in saving time and will be more useful in malls, theatre and hotels. And this can be enhanced by allowing only the cars by scanning their number late which would be given in the database. It can be implemented in apartments for security purposes.

REFERENCES

1. Sunil chouhan, Sandhiya p, “Internet of things-based car parking system”, Vellore Institute of Technology, Chennai, Tamil Nadu, India, 2017.
2. Uma Maheswari, Aswini , Dr. Gururaj Murtugudde , Karthiga, Department of Computer Science and Engineering ,Department of Information Science Engineering. Kumaraguru College of Technology Coimbatore, India .Sri Venkateshwara College of Engineering, Bangalore, Jayalakshmi JU.G Student, Kumaraguru College of Technology Coimbatore, India. “Automatic car parking system “,2018.
3. T. N. Pham, M.-F. Tsai, B. D. Nguyen, C.-R. Dow, and D.-J. Deng, A cloud-based smart-parking system based on Internet of-Things technologies, IEEE Access, 2015.
4. L. Yu, D. Shao, and H. Wu, Next generation of journey planner in a smart city, in Proc. IEEE Int. Conf. Data Mining Workshop (ICDMW), 2015.

5. R.Khan ,Z.Khan,Y.A Shah,K.Ahmed,A.Manzoor and A.Ali, Intelligent Car Parking Management System on FPGA, International Journal of Computer Science ,2013.
6. J. P. Benson ., Car-park management using wireless sensor networks, in Proc. 31st IEEE Conf. Local Computer Network, 2006.

IMPACT OF ONLINE LEARNING FROM HOME

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ABSTRACT

Online learning is gaining more popularity nowadays among working professionals and students pursuing higher education. online learners generally tend to find benefit in the autonomy(self-government) and flexibility that these online learning offer. Online learning requires greater amount of motivation and self-discipline than a classroom-based learning. A classroom may have one or more instructors and peers, who can take control of the class for their courses. In contrast, online learning involves setting students their own aim, tracking progression and meeting time limit. Distance learning has been around for a long period of time, even before technology made it extremely accessible. With this online learning moving into the long term, experts say that it would be challenging in terms of mental, academic and emotional part.

Keywords: *Online learning, learning process, home learning, distant education, pandemic, Covid-19, technology, health risk.*

INTRODUCTION

The COVID-19 pandemic has paved way for new learning methodologies. All around the world, even great educational institutions are looking toward online learning platforms to continue with the process of educating students. As with most teaching methods, online learning also has its own set of boons and curses. Identifying and understanding these pros and cons will help institute in creating effective strategies for delivering the lessons, ensuring an uninterrupted learning.

Requires Wifi / Data Connections

The most and primary defect of online learning is that it requires Wi-Fi / Data connections. We all know that, in current times, most of the institutes have switched to online classes. But it has a drawback that many people don't own android phones or gadgets, which is a harsh reality. Also, there are some who have these devices but are find the price of the data packs costly. In remote areas, there won't be sufficient network bandwidth to get access to online education. Even though if they manage to get sufficient bandwidth, there are some restrictions in data usage, that is, some data packs offer 1.5gb per day, so now they need to move on to some better network source – here Wi-Fi comes as a solution, but some may not find the price affordable. Even though if they afford it, they may not get uninterrupted network connectivity all the days. Sometimes, the signal is lost and therefore the class is missed. As an online student, one can access class wherever they have a connected device, but a strong internet connection is required. Low bandwidth and weak network connectivity can affect how quickly you can join and participate in class. This implies that virtual learning is useful but not successful. Other reasons are the lack of preparedness for it. The other is the unavailability of the books as the new session had to begin and the students didn't have the material for their next class.

Require You to be an Active Learner

Due to lack of in person communication between students and teachers in a virtual platform, the students are finding it difficult to work effectively in a team. The problem is that a majority of virtual training focus mainly on developing theoretical knowledge, rather than imparting practical skills. The reason for this evident --- theoretical lectures are way easier to convey in a virtual environment than practical demonstrations. According to OECD (Organization for Economic Cooperation and Development) average percentage of computer illiterate people is around 30%, which has major trouble in accessing E-Learning content. Solving the complex problem of raising computer literacy among our people is not an easy job. However, initiative such as Digital India assures in increasing the computer literacy rates amongst the population.

Require Good Time Management Skills

As an online learner, one needs to learn on a daily basis. Most of the online courses are not taught in real time and there is no time set for classes, that is one can view the recorded session whenever they want. This is one of the benefits of online learning. However, it can be a drawback for a student who is unable to stick to a routine study schedule, or is not self-directed to independently complete assignment without daily reminders from an educator. It is important for the student who is more focused on studies as well. That is, it won't be good if a student spends majority of their time in online, as it may result in eyestrain, bad posture, and other physical problems that may affect them. They need time management skills because they have responsibility outside of school, such as for personal work and family. Great time management skills are essential to succeed. Like practice makes a man perfect, effective time-management skill have to be learnt and they don't just happen.

Gives You Way More Freedom, Than That You Can Handle

Although it gives student an opportunity to learn, it also distracts them. Once the academic classes are over, they start surfing other things. Hence the impact of learning is uncertain and not always best. Another disadvantage of virtual environment is cheating through different methods. Students can easily cheat on assessments in an online mode as they take exams in their own environment, using their personal computer. For observing the student during an exam requires turning on their video which is a way more difficult for observation rather than in traditional classroom setup.

Will Not Let You to Face the Physical World

The lack of one-to-one interaction sums up with many of the earlier mentioned cons of online education. A lack of any kind of one-to-one interaction with the mentor inhibits students to feel a lack of urgency.

A lack of pressure is another disadvantage which causes students to get distracted from their studies more easily.

Require That You Find Your Own Path of Learning

As an online learner, one must be able and willing to self-direct their educational journey. This means taking full control.

Lack of self-motivation among the students is still one of the main reasons why student feels unproductive to interact in an online learning platform. In lively classrooms, there are numerous factors which push students towards their learning goals. In person interaction with instructors, classroom activities, and strict schedule all work together to keep the students from failing off track during their academics. As a result, keeping in track and sticking to a schedule becomes difficult for those students who are not self-directed.

"TELL ME AND I FORGET.

TEACH ME AND I REMEMBER.

INVOLVE ME AND I LEARN."

When I hear it, I forget it, When I see it, I remember it, When I do it, I know it.

Offer Flexibility Like

ANYWHERE

Students can participate in classes from any part of the world, provided they have a device and a stable internet connection. In addition, the virtual mode of learning allows physically disabled students and teachers more opportunity to engage in class at their comfort. They can access the online classroom through their device instead of having to "go to the classroom" physically.

"ONLINE LEARNING CAN BE A LIFELINE TO THOSE WHO HAVE OBSTACLES, SUCH AS GEOGRAPHICAL DISTANCE OR PHYSICAL DISABILITIES."

Anytime, Any Pace

The online Classroom is accessible anytime round the clock, all day and all night. Time management is another advantage acquired from the online learning format. Non-lively communication through virtual conferencing event allows the executive managing with their work, family, to take part in exchanging ideas. There is a flexibility of doing the work at their convenient time. Students can access their learning materials, and class discussions from anywhere at any time. This is mainly favorable for those slow learners who require more time to understand and retain about the concepts.

Creative Teaching

Some instructors have taken much effort in imparting these concepts in face-to-face learning environment. However, there are still a few classes which exists based on theoretical lectures and plainly mugging up of concepts. The magic of the self-managed and self-involved world of the virtual classroom makes innovative and thoughtful method to guidance even more important.

Education in Your Home

Students will not be bound to live classroom session when they go for online learning. All presentation and learning materials are provided through a virtual platform for easier access from the comfort of their home. Comfort is a great advantage, but it can turn as a disadvantage too. One shouldn't allow themself to get too restful while studying from home, so it would be best if they leave the sofa/bed for some hours day and set up a desiring studying environment in their home. All we need is desk and a chair.

Reach People Through Out the World

Institutes creates a lively environment to the students but they are habituated to the same people every day on a campus, so they don't have great exposure to the outside world. The availability of the internet is one of the biggest advantages of online learning. Through a virtual platform, one can meet people on the opposite side of the world. Each conversation offers more chance for growth as you take a look at and gain new skills to enhance yourself.

More Interaction

Some might assume that live learning in a physical setting is the most natural and is best way to interact. But that in fact may not be the case with the average student's wo exhibit more shy behavior in the physical space. A student with the ability to hide may seem like a disadvantage of online learning. But now, teachers have the flexibility of administering online quizzes to make sure every student is engaged, as well as enriching videos to create a better learning experience in online mode.

Methodology

The methodology of this study was to research on online learning from home. It provides an investigation of the question of how students experience online learning. The study understands the importance of online leaning in the period of a crisis and pandemic such as Covid-19.

CONCLUSION

No amount of virtual learning can match the environment that one gets in the classroom. Studies suggest that children learn better through face-to-face interaction and group study also helps in developing their communication skills.

"TALK TO PEOPLE. CONNECT WITH THEM.

MAKE THE E-LEARNING SOUND LIKE IT'S A

CONVERSATION BETWEEN PEOPLE.

REAL PEOPLE, NOT ROBOTS."

ACKNOWLEDGMENT

I would like to express my special thanks and gratitude to my teacher Dr. R. Radha (Associate Professor) for being my mentor and giving me this golden opportunity to do this wonderful journal on the topic (IMPACT OF ONLINE LEARNING FROM HOME), which also helped me in doing a lot of research and I came to know about so many new things I am really thankful.

WEBSITES

1. https://www.educations.com/articles-and-advice/5-reasons-online-learning-is-future-of-education-17146
2. https://oedb.org/ilibrarian/10-advantages-to-taking-online-classes/
3. http://onlinelearningsuccess.org/advantages-and-disadvantages-of-online-and-classroom-learning/
4. https://library.educause.edu/topics/teaching-and-learning/online-learning
5. https://continuingstudies.uvic.ca/online-learning
6. http://www.wlac.edu/online/documents/otl.pdf
7. https://www.forbes.com/sites/ilkerkoksal/2020/05/02/the-rise-of-online-learning/?sh=3f749d5c72f3
8. https://digitalmarketinginstitute.com/blog/5-advantages-of-online-learning
9. https://www.indiaeducation.net/online-education/articles/what-is-online-education.html
10. https://www.qlsacademy.com/online-teaching-method/

11. https://textilevaluechain.in/2020/10/01/online-education-a-boon-or-a-curse/
12. https://www.linkedin.com/pulse/elearning-boon-curse-akash-chander/
13. https://duexpress.in/online-classes-boon-or-bane-what-students-say/

AUTOMATIC DRIVERLESS TRAIN BETWEEN STATIONS

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ABSTRACT

The main aim of the project is to implement an automatic driverless train that runs automatically from one station to another. In this system Arduino microcontroller is major component that helps the module to run. The motor driver module helps in the movement of the train and infrared sensors helps the train to stop when the station arrives and also ultrasonic sensors helps the train to stop when the sensors sense the obstacles. When the train arrives at the station the doors are automatically opened and allow the passengers to enter into the train. The train is also given with passenger counting section that displays counts of the passengers who are entering and exiting the train in LCD. The train also provided with emergency button that helps the passengers if they have any emergency issues. If the emergency button is pressed the train stops and the door will be opened. The train also gives a buzzer alert when the doors of the train are closed and also warning when the train starts. Thus, by implementing this system, it can reduce human mistakes and also provide a safety ride to the people.

Keywords: *Arduino UNO, IR Sensors, LCD Display, Automation, Motor Driver.*

INTRODUCTION

In most of the countries the automatic driverless train shuttle between stations is implemented in metro shuttle train. This project allows the train to run without the humans so that the errors done by the humans are reduced. In this system infrared sensors are provided with the train and the station. This helps the train to stop at the stations. Also, the train doors are provided with sensor that senses the passengers who enters the train and display the count of the passengers in LCD displayer. The train is set with some capacity. If the capacity reaches the maximum level then the train doors close automatically. The train doors opens and close according to some time interval which is set in the microcontroller. An alarm is given when the train door shut and also when the train starts. All these methods are controlled by the Arduino uno microcontroller. For opening and closing the door and also for the movement of the train, two motor drives are used. By using this method, the timing of the train can be maintained and also reduces the accidents and also requirement of the driver is reduced.

Related Work

Various methods are used and developed by many people for this project. One of the papers proposed Automatic platform sensing and Door control system. It has two major components such as photodiode system and an Infrared LED. Here the sensors are used to sense the train when it reaches near the station and the motor drives automatically by the motor driver and it also stops automatically at the station. The sensors are also used to open and close the doors when it senses the person who tries to enter/exit. The train is set up with a passenger counter system which is used to count the passengers who enters into the train. The train is supplied with a specific limit of passengers, so if the train is full the doors of the train are closed automatically and also the train will start moving after a specific cut-off time.

The method which had been used here to control the movement of train by arranging the Infrared LED and photodiode in parallel to each other on the both sides because the photodiode doesn't get the sunshine pulses, it doesn't conduct and as a result, the microcontroller will get a high signal. The radiation from the IR LED gets reflected by any object, when the train reaches station and therefore the reflected light falls on the photodiode, causing it to conduct and it provides an interrupt low signal to the microcontroller with the help of transistor. The motor drive IC are given for the operation of the motors. The microcontroller connects two stations a through a motor drive. When the train stops, to prevent the motors the motor driver receives a disrupt signal which is from the microcontroller and to open the doors for the passengers to allow them inside the train, a high signal sent to the door motor driver. The microcontroller is coded such the door is opened till the number of passengers reaches the limit and sends signal to the motor driver to close the door [4].

Methodology Used

Driverless train is constituted with the ARDUINO based device. This train system is programmed in such a way it travels within the specified path. The program conveyance the halt timing of the train with the distance between the two stations which is predefined.

In this project, an IR sensor, Motor driver, Ultrasonic sensor and an emergency button are used. The common block diagram (Fig. 1) explains the flow of the shuttle between the stations.

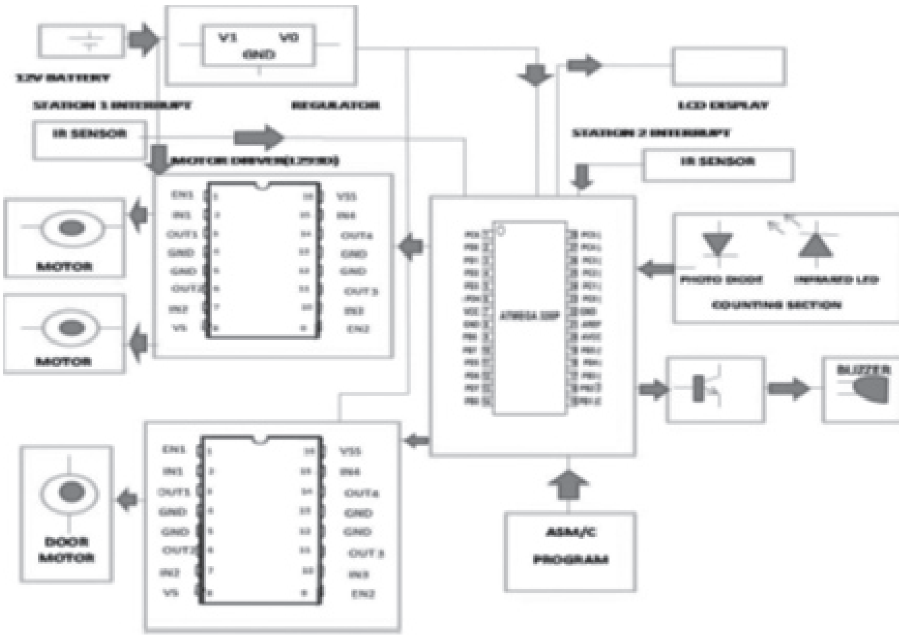


Figure 1: Block diagram [4]

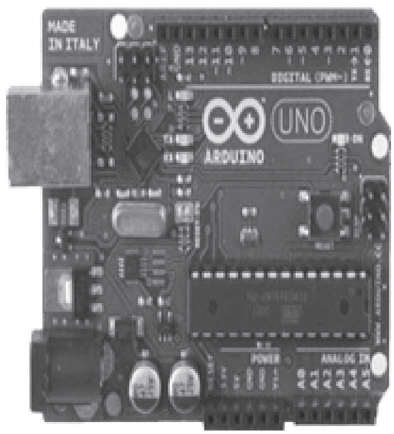
ARDUINO UNO (Atmega328)

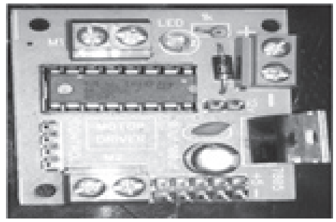
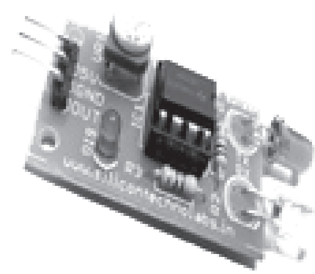
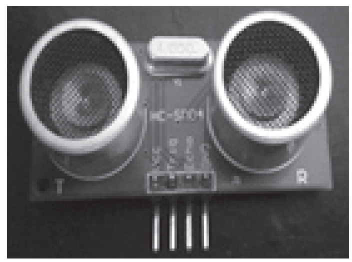
ARDUINO UNO (Fig.2) composed by a microcontroller board of the datasheet (ATmega328). It consists of

a. 14 digital Input/Output pins in which 6 is used as PWM Outputs and 6 analog inputs.

b. 16Mhz Crystal Oscillator, Power Jack ICSP header, USB connection and a reset button.

The working of ARDUINO is to connect it with the computer with the USB cable as it is a supporting configure of microcontroller. The UNO has the wide differ from all the other boards. This UNO been specialised from the word "one in Italian" marked for the upcoming release of ARDUINO 1.0.The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. It featured the programme of Atmega8U2 as a USB-to-serial converter. "Uno" comes from the word "one in Italian" and is named for the upgraded invention of Arduino 1.0.



L29 3D MOTOR DRIVER The active principle of L29 3D Motor Driver (Fig. 3) is a root of Half-H Bridge. The configuration of H- bridge is to operate the motor both in clockwise and anti-clockwise direction. The Speed and direction control is conserved using this motor.	
IR SENSOR InfraRed SENSOR (Fig. 4), electronic device. IR reflectance sensor is to measure the colour and distance. The measuring distance is from the range of 1mm to 8mm and the central point is if 2.5mm. During this time the IR continuously emits an IR light to a particular distance, if the strength is not reachable automatically the Triode will be in the OFF state. The automatic door close/open utilises this IR sensor configuration.	
ULTRASONIC SENSOR An ultrasonic sensor (Fig. 5) is a device used to estimate the distance to an object using the ultrasonic waves. An ultrasonic pulse of 40hz transmits through the air, presence of obstacles or objects automatically bounce back to sensor to provide an alarm signal. As this sensor used as a proximity sensor to avoid the obstacles.	
16*2 LCD DISPLAY LCD Display (Fig. 6) is a flat panel display contains two lines of 16 characters. This device is used to display the source/destination station name with the help of LED and gas plasma displays. This information/ actions performed by the controller.	
EMERGENCY BUTTON Emergency Button [Fig. 7] is preserved as a red button or an emergency brake setting provided manually to activate the emergency. Here the emergency buttons prevail the option for opening the door automatically.	

Result

The commutation of metro trains between the stations is organised well and conclude to an open horizon of developments. As this assignment is of driverless train more caution made to avoid the obstacles such as emergency exist through buttons, IR sensor for automatic door generation and LED display to display the destination at regular stretch. This project is implemented in the queue for future technologies with such a way for modern transport services.

The advanced enhancement of this implementation is designed to manipulate the critical situation faced in existing methods such as IR sensing, travelling distance and speed. This system manipulates the number of passengers getting into the train and even the buzzer sound which alerts the passengers about the automatic generation of the door open/close between the stations.

The computation of passengers inside the train avoids the people to be thronged inside the train. These advantages result the project with the best as by our model (Fig. 7 & Fig. 8).

Figure 7: Train Model 1 (self)

Figure 8: Train Model 2 (self)

CONCLUSION

The automatic shuttle between the stations with driverless train system is dispensed as the final year project. The project is completed with a scope of applying new technology and find a better solution in future. Researching and developing such working helps us to increase self-confidence and assurance and by acquiring the necessary information we can design a system and apply to solve the particular problem in this world. Moreover, when expanding a prominent system could be generated as far as to enlighten the advanced form of the control system for such a real driverless trains system. Thus, our project makes the world as a best for the prolonged environment.

FUTURE WORK

The project would be interesting to develop by implementing a control centre. One can also expand the railways to accommodate multiple trains that can interact with each other. This project work can still enhanced by review of improved mechanical process of the doors. By using software than Arduino, programming could have advanced the system to a more qualitative result. For example, a software iterating parallel sequences.

REFERENCES

1. "Metro Automation Facts, figures and trends". Belgium:The International Association of public Transport (UITP), Cappaert – Blondelle. 2012.
2. "Twenty years of Experience with Driverless metro in France", VWT 19 proceedings Dresdes in, Erbina J.M, Soulasa C. 2003.
3. ParkashRatan, Chandra Jogi. "Auto Metro Train to Shuttle between Stations". International Journal and Magazine of Engg, Technology, Management & Research.
4. Sachi.P , Bharathi.V , Naveen Kumar.D ,Tejaswini.M, "Shuttling of Metro Train between Station", Students of Department of Electronics & Communication, New Horizon College of Engineering, Bangalore, Karnataka, India – 2018.