Conference Proceedings

ICET 2022

International Conference on
Emerging Trends: Innovations & Challenges in Information Technology and Management (Online)
24th and 25th June, 2022

ORGANIZED BY

Bharati Vidyapeeth's Institute of Management and Information Technology, Navi Mumbai

(NBA Accredited, Affiliated to University of Mumbai)

Conference Proceedings

ICET 2022

International Conference on Emerging Trends: Innovations & Challenges in Information Technology and Management (Online)

24th and 25th June, 2022

Organized By

Bharati Vidyapeeth's Institute of Management and Information Technology, Navi Mumbai
(NBA Accredited, Affiliated to University of Mumbai)

Conference Proceedings

NEX GEN PUBLICATIONS

India | UAE | Nigeria | Uzbekistan | Montenegro | Iraq | Egypt | Thailand | Uganda | Philippines | Indonesia

www.nexgenpublication.com

Conference Proceedings

Edited By:

Dr. Suhasini Vijaykumar

Dr. Priya Chandran

Dr. Pratibha Deshmukh

First Impression: August 2023

Conference Proceedings

ISBN : 978-81-19477-18-0

Rs. 1000/- ($80)

DISCLAIMER

Information contained in this book has been published by Nex Gen Publications and has been obtained by the editors from sources believed to be reliable and correct to the best of their knowledge. The author is solely responsible for the contents of the articles compiled in this book. Responsibility of authenticity of the work or the concepts/views presented by the author through this book shall lie with the author and the publisher has no role or claim or any responsibility in this regard. Errors, if any, are purely unintentional and readers are requested to communicate such error to the author to avoid discrepancies in future.

Published by:
Nex Gen Publications

BHARATI VIDYAPEETH'S

Institute of Management and Information Technology(NBA Accredited)

Sector- 8, CBD, Belapur, Navi Mumbai - 400 614

www.bvimit.co.in

ABOUT BHARATI VIDYAPEETH

Bharati Vidyapeeth was established in 1964 by Dr.Patangrao Kadam, working on the theme, "Social Transformation through Dynamic Education", keeping the objective of intellectual awakening and all round development of people in different spheres suchas education, economic, social and culture fields in India. Today it has created historyby establishing 169 educational institutes imparting education from the pre-primary stage to post graduate stage.

ABOUT BVIMIT

To keep pace with the modern times, the year 2002 marked the establishment of Bharati Vidyapeeth's Institute of Management and Information Technology (BVIMIT). At BVIMIT,we impart I.T management education to meet the demand of the I.T. industry. Learning become a wonderful experience at BVIMIT, using a mix of exploration, exchange, and interaction and imparting knowledge to churn the students for the industry. This also prepares the students to handle the day to day complex problems arising in the IT sector and perform outstandingly in the IT world by imparting the requisite skill sets.

Vision

Providing high quality, innovative and value-based education in information technology to build competent professionals.

Mission

- Technical Skills:--To provide solid technical foundation theoretically as well as practically capable of providing quality services to multi- disciplinary industry.
- Development: -To provide comprehensive educational programs and promote lifelong learning in the field of Computer Applications based onthe changing needs of IT industry and society worldwide.
- Innovation:-To promote innovation and excellence in delivery and assessment to ensure ethical and holistic development of students for employability, entrepreneurship and higher education.
- Ethical leadership: - To develop ethical leadership awareness in the students to succeed in industry, government and academia.

ABOUT ICET 2022

International conference on emerging trends: Innovation & Challenges in IT and Management (ICET 2022) is organized by BVIMIT, Navi Mumbai for the presentation of technological advancement and research in the field of theoretical, experimental and applied area. ICET 2022 has a profound influence on all the braces of computer application, computer science and management as well. New technologies are constantly emerging which are enabling application in various domains and services. ICET 2022aims to bring together the international community of researchers, academics & practitioners to explore the latest advancements and future scope in the emerging trends.

A BRIEF ABOUT ORGANIZING COMMITTEES

CHIEF PATRON

Hon'ble Dr. Shivajirao Kadam
Chancellor, Bharati Vidyapeeth (Deemed to be University), Pune.

Hon'ble Dr. Vishwajeet Kadam
Pro-vice Chancellor and Secretary, Bharati Vidyapeeth (Deemed to be University),Pune

Hon'ble Dr. Manikrao Salunkhe
Vice Chancellor, Bharati Vidyapeeth (Deemed to be University), Pune.

PATRONS

Dr. Vilasrao Kadam
Director, Educational Complex, Navi Mumbai

GENERAL CHAIR

Dr. Suhasini Vijaykumar
Principal, Bharati Vidyapeeth's, Institute of Management and Information Technology, Navi Mumbai

ADVISORY COMMITTEE

Dr. Sri Ganesh Thotempudi
Heidelberg University, Germany

Mr. Siddharth Sengupta
Director AWS Business Unit, TCS, USA

Dr. Resmi Ramachandran Pillai
Linköping University, Sweden

Dr. Gopakumaran Thampi
Principal, TSEC, University of Mumbai

Dr. Sachin Kadam
Director - ICT, Bharati Vidyapeeth University, Pune

Dr Bindu Krishnan
Professor and Head, Dept of Data Science, CS & IT,Jain University, Kerala

Dr. Rajeev R. R.
Programme Head, ICFOSS, Kerala

Dr. Avinash Sharma
Principal, Maharshi Markandeshwar Eng. College, Haryana

Dr. Narendra M.Shekokar
HOD CS, D. J. Sanghvi College of Engineering, Mumbai

Dr. Ganesh Magar
HOD, PG Department of CS, SNDT University

CONVENER

Dr. Priya Chandran
Assistant Professor

Dr. Pratibha Deshmukh
Assistant Professor

CO-CONVENER

Ms. Shubhangi Mahadik
Assistant Professor

Ms. Sudeshna Roy
Assistant Professor

ORGANIZING COMMITTEE

Dr. Jyoti Kharade
Associate Professor, BVIMIT

Ms. Shravani Pawar
Assistant Professor, BVIMIT

Dr. Shambhu Rai
Assistant Professor, BVIMIT

Ms. Gunjan Behl
Assistant Professor, BVIMIT

Ms. Nidhi
Assistant Professor, BVIMIT

Ms. Rasika Patil
Assistant Professor, BVIMIT

Dr. Kirti Muley
Assistant Professor, BVIMIT

Mr. Manish Dubey
Assistant Professor, BVIMIT

Message from the Principal & General Chair

It gives me immense honour and pleasure to present the International Conference on Emerging Trends: Innovations & Challenges in Information Technology and Management, ICET 2022, proceedings organized by the MCA Department of Bharati Vidyapeeth's Institute of Managent and Information Technology.

The conference aims to bring different ideologies under one roof and provide opportunities to exchange ideas to establish research relations and to find global partners for future collaborations. The theme for the conference is to provide are indicative of recent and emerging trends in Information Technology around the globe. Some of the sub themes include: Data Science, Artificial Intelligence, Information Security, Cyber Security, IOT and Blockchain, providing immense and enlightening ambit of discussion.

I congratulate all the budding and emerging researchers for contributing their valuable academic understandings. I also congratulate the organizing committee members and staff of our college for their co-operation and support in organizing this international conference.

Dr. Suhasini Vijaykumar
Principal & General Chair,
BVIMIT, Navi Mumbai

Message from the Convenors

We are very delighted to introduce the conference proceedings of the ICET-2022 which had been held at Bharati Vidyapeeth's Institute of Managent and Information Technology, Navi Mumbai, on 24th and 25th June, 2022. The primary objective of organizing this conference is to share and enhance the knowledge of each and every individual in the rapidly advancing Information Age. This conference marked as an inception of a wider pedestal for fellow research scholars, faculties, students, industry leaders and subject experts to engage in insightful exchange of thoughts in the latest advancement in the area of Information Technology. This event has accomplished to garner people from varied and diverse sectors and actively churned their thoughts into action. We hope that the programme manifested proves as an enriching launching platform for the future association and exotic result.

We would like to express our thanks to all participants, authors, reviewers and keynote speakers for their contributions to the conference program and also appreciate the hard work of the committee in organizing the conference.

Dr. Priya Chandran

Dr. Pratibha Deshmukh

Convenors – ICET 2022

Table of Contents

COLOUR PALETTE EXTRACTION OF DOMINANT COLORS IN A COLOUR IMAGE USING SELF ORGANIZING MAP

Anand Upadhyay[1], Muskan Shekhawat[2] and Rashi Manhas[3]
[1]Assistant Professor, Thakur College of Science and Commerce, Kandivali (E)
Mumbai, Maharashtra 400101
[2,3]Student, Thakur College of Science and Commerce, Kandivali (E)
Mumbai, Maharashtra 400101

ABSTRACT
Picking an appropriate colour theme for a website is a very tricky thing as it can change the look and feel of a website. In web designing, it raises interest and engages users with the website. In any case, there are sure perspectives that can be tended to on a more all-inclusive level. Things like the normal implications of the principal tones (Primary, Secondary, Tertiary), conventional colour palettes, and social varieties in colour implications are generally genuinely direct. Brand values ought to assume a vital part in making a colour palette. Yet, they're by all accounts not the only significant element. Industry standards are likewise key, as are colours previously being utilized by contenders. When we see an image and we want to use the theme of that image in our design it can be difficult as an image comprises multiple colours and it becomes difficult to identify the theme. The manual process of identifying the different dominant colours from the image and utilizing them in the design process can consume a lot of time and resources. In this paper, the Self-Organizing Map method is used to extract colours from an image. This method can be used to extract the colours and it will be easy to identify the theme and use the received colour. It will be easier to determine which colours from the colour palette should be used during the design process to ensure an enhanced user experience.

Keywords: Colour palette; Colour Extraction; Self-Organizing Map; Clustering; Dominant colours, Colour scheme.

General Terms Keywords
Image, Algorithm, Colours, User Interface, Website, Web, Metadata, machine learning, mood, colour emotion

1. INTRODUCTION
Colour is the first thing a visitor sees on the website before exploring website content and the language in which the content is offered. Each website can have a competing website with similar content. Therefore, inappropriate selection of colour may be an important factor in the visitor's choice [11]. Colours is one of the most powerful tools used in web designing, it can be useful in gaining response from targeted consumers, as it influences human psychology. Colour perception is affected by person's gaze – colour, which is located in the canter of the field, will seem more expressive and colourful than others [11]. Colour can simulate emotional reactions, perception, can have the ability to convince, represent the importance and trustworthiness of content and other things [11]. For example, the red colour creates alert, and the green colour brings peace. In addition to the appearance of colour emotion, colour coding guidelines can also be used in the web UI design like the red button to attract attention and make users alert on the website.[9]. Appropriate colour selection should be used in any website element, starting with the colour choice of the brand logo images, background and text colours.[9]. The colour of the website should express its identity, individuality and mood. Colours must be related to the content and objectives of the website. The element of making an emotional, motivating and persuasive website is a User Interface (UI).[9]. It should be attractive and easy in terms of navigation.[9]. To make a persuasive web design, there are five principles of design.[9]. There is clarity, good layout, good visual hierarchy, good use of colour, and easy navigation.[9] Thus,

the hypothesis formulated about colour as a design element can help to improve the visual appeal to make the website more attractive with the right composition and the striking colours [9]. Colours should be consistent with the content owner to represent the style of the identity and logo. Often website design is adjusted to the brand's logo [1]. Colour scheme extraction plays a very important role in film production and application. The colour scheme is an interpretation of the scenario by the cinematographer and it can convey a mood or feeling that stays with the viewer after the movie has ended.[4] It also acts as a contributing factor to describe a film, like the metadata fields of a film such as a genre, director, and casting.[4] Moreover, it can be automatically tagged unlike metadata, so it can be directly applied to the existing movie database without much effort [4]. The previous research has observed 100 homepages of actual websites. This would suggest that the colours used on a website might be one of the key factors of the visual appeal [9]. Table I shows that colour emotion in web UI design and its meaning.

Table 1: Colour emotion on web UI design [9]

Colour	Promotes
Red	Importance, power, youth.
Orange	Uniqueness, friendliness, arise energy and a sensation of movement.
Yellow	Happiness, enthusiasm, antiquity (darker shades).
Green	Growth, stability, financial themes and environmental themes
Blue	Safety, calm, openness (lighter shades), strength and reliability (darker shades).
Purple	Luxury, romance (lighter shades), mystery (Darker shades).
Black	Power, edginess, sophisticated and timeless.
White	Simplicity, cleanliness, virtue.
Gray	Formality, neutrality, melancholy.
Ivory	Elegance, simplicity, comfort.
Beige	Traits of surrounding colours, humility, a secondary. or background colour.

2. LITERATURE REVIEW

It is difficult to extract a theme from an image. Consider a scenario where we are requested to create a web design based on a specific colour theme concerning an image, it will be a tricky task to identify the appropriate colour and use it. So, we can extract colours present in the image select the colour matching the theme and use it. A lot of research has been done to extract colours from images. Notwithstanding the way that tone is typically seen as just a tasteful choice of the creators, it is a centre component of the emotional and psychological effect of a plan on clients. Colour plays an important role in any user interface. A study was conducted by Ackay O et al in 2011 where they carried out a review of the literature and discuss cross-cultural meanings and associations of color among consumers in different nations, to find out if color is important across all product categories.[1] In a paper by Jahanian A et al, they suggest an autonomous mechanism for extracting colour palettes from an image. By using visual saliency, they extract the fine colours appearing in the foreground along with the various colours in the background regions of an image.[3] Colour themes, pallets are important to set the ambience and aesthetic of the interface. Kim S et al proposed an automated method to extract a colour scheme from a movie. The colour scheme is an interpretation of the scenario by the cinematographer and it can convey a mood or feeling that stays with the viewer after the movie has ended. It also acts as a contributing factor to describe a film.[4] A color scheme is an association of colors, i.e., a subset of all possible colors, that represents a visual identity [4]. The colour scheme is an interpretation of the scenario by the cinematographer and it can convey a mood or feeling that stays with the viewer after the movie has ended. It also acts as a contributing factor to describe a film, like the metadata fields of a film such as a genre, director, and casting [4]. Kim S et al proposed a method which produces a color scheme from a movie in

a bottom-up manner from segmented shots. They formulate the color extraction as a selection problem where perceptually important colors are selected using saliency [4]. Lai P et al in their paper showed a close agreement between these data and the colours automatically generated using a model that incorporated both supervised and unsupervised machine learning. The work could be extended to analyze millions of images from social media feeds to provide data-driven insights for colour forecasting [7]. Pavan Kumar et al in 2020, dove into much more proficient techniques with a specific end goal to remove the prevailing shading palettes from the picture using K means clustering. In this manner, utilizing a grouping calculation and a significantly more ideal instatement technique, effective shading palette is extracted.[8] Emotional advertising on the Internet such as websites and social media can be highly beneficial for Small Medium Enterprises (SMEs) [9]. However, not all of the SMEs have a website that meets all of the principles of website design which are persuasive [9]. Moreover, the color is rarely considered in making websites to raise the emotional bonding between the products and audiences of SMEs [9]. Colour theme in a user interface plays an important role in user experience. Using self-organizing map, we can extract the dominant colours from an image which can be used as reference for deciding the colour theme of an interface.

3. ALGORITHM

The central property of the SOM is that it forms a nonlinear projection of a high dimensional data manifold on a regular, low-dimensional (usually 2D) grid. In the display, the clustering of the data space, as well as the metric-topological relations of the data items, are clearly visible.[6] Here, we have used Self-organizing map for extracting the colour palette from the input image. Self-Organizing Maps give a benefit in keeping up with the underlying data from the preparation information and are non-linear. A vector W_n of weights is associated with each neuron ‘n’. To train a SOM, the process includes going through multiple training iteration until the item in the dataset are learnt by the SOM. For each pattern ‘x’, one neuron ‘n’ will win which refers that W_n is the weights vector which is more similar to x. The weights of this winning neuron will be adjusted. The steps involved in the training algorithm are follows: The Self-Organizing Map algorithm can be broken up into 6 steps:

1. Each node's weights are initialized.[2]
2. A vector is chosen at random from the set of training data and presented to the network. [2]
3. Every node in the network is examined to calculate which ones' weights are most like the input vector. [2]
4. The winning node is commonly known as the Best Matching Unit (BMU). [2]
5. The radius of the neighbourhood of the BMU is calculated. This value starts large. Typically, it is set to be the radius of the network, diminishing each time-step. [2]
6. Any nodes found within the radius of the BMU, are adjusted to make them more like the input vector. The closer a node is to the BMU, the more its' weights are altered. [2]
7. Repeat 2 to 5 for N iterations.[2]

4. METHODOLOGY

Self-organizing map was used to find out the colour palette from an input colour image. MiniSom package was used for the implementation. MiniSom is a minimalistic Numpy-based Python implementation of self-organizing maps.[10]

For this implementation, we will load an image and then build a matrix. In this matrix each row represents the colour of a given pixel in the image in the RGB space and the columns represent the intensity in a specific colour.[10]

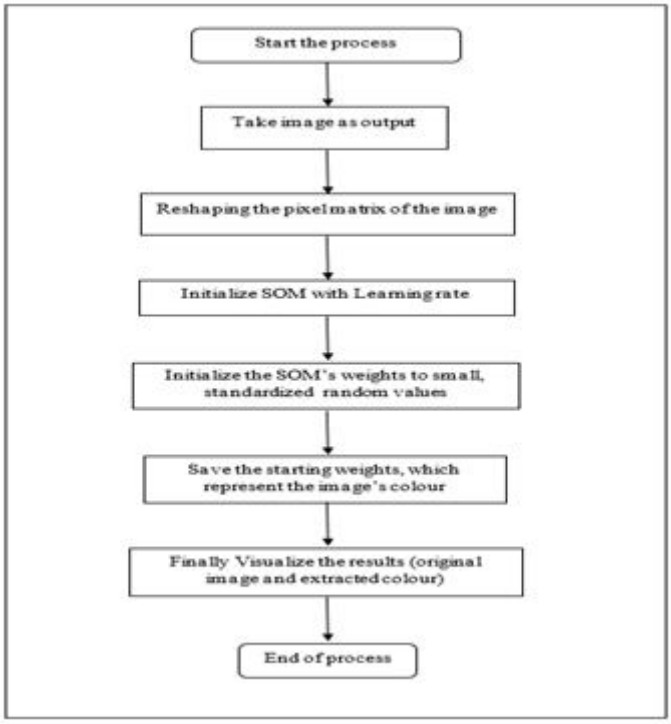


Figure 1: Methodology steps

The following are the steps used:

1. As seen before, we will be using MiniSom which is a NumPy implementation for self-organizing maps. We thus, have to load in our image as an array.
2. Since it is a 3D matrix, we need to convert it into a 2D array.
3. The first parameter is the dimension of the self-organizing map. For our implementation, we'll build a 1-by-9 SOM. This means that the final colours we get will be 1 * 9 which is 9. The second parameter is input length, which is the number of features in our dataset. In our case, we use 3, which corresponds to the shape of the pixels array.
4. The next parameter is Sigma. Sigma is the radius of the different neighbours in the SOM. The last parameter is the learning rate, which determines how much weights are adjusted during each iteration.
5. For this implementation, a sigma of 0.1 and a learning rate of 0.2, was taken which gives better results.
6. The next step is to initialize the SOM's weights to small, standardized random values.
7. We now need to save the starting weights, which represent the image's colours i.e., colour palette.
8. Finally, we plot the results. To do this using one figure and 2 subplots. The first and second subplots will show the original image and the image colour palette respectively.

5. RESULT

Colours are used by designers to shape the way an end user perceives the information and various details about the product or the brand. So, it is crucial for the designers and product owners to know the colours and the meaning behind them. Colour psychology is a critical part of making a diverse colour palette which will work admirably in design. While variety is in

some cases considered a simply tasteful decision by certain designers, it is, as a matter of fact, a critical part of the psychological effect on clients.

A thoroughly examined out colour palette can hoist a plan from "great" to "amazing" while an unremarkable or terrible colour palette can diminish a client's general encounter and even obstruct their capacity to utilize a site or application.

The colour palette extraction from input colour images is achieved by the usage of a Self-organizing map algorithm. results in following figures.

Figure 2: Input Image

Figure 3: Output Extracted from Image

Figure 4: Input Image

Figure 5: Output Extracted from Image

Figure 6: Input Image

Figure 7: Output Extracted from Image

As seen from the images above, we have used multiple colour image inputs to test our implementation. We can see that the extracted colours i.e., colour palette comprises of the dominant colours present in the image input which constitutes major part of the image. We have seen that self-organizing map has produced good results while extracting the colour palette from the image input which can be used for various applications in design. Notwithstanding the way that tone is typically seen as just a tasteful choice of the creators, it is a centre component of the emotional and psychological effect of a plan on clients. Quantization error and topographical error are main measurements to assess the quality of SOM. Quantization error is the average difference of the input samples compared to its corresponding winning neurons (BMU). It assesses the accuracy of the represented data; therefore, it is better when the value is smaller.[12]. Topographical error assesses the topology preservation. Therefore, the smaller value is better.[5]

Table 2: Quantization and topographical error

Technique	Quantization error	Topographic error
Self-Organizing Map	0.109	0.763

6. CONCLUSION

The major responsibility of a designer is to ensure to create a good design by choosing the right colour palette and colours.Metrics such as quantifying aesthetics of images and visual design can be achieved by using the right colour palette. The manner by which the colour is utilized can likewise decisively affect how it's apparent. For instance, blue utilized as an essential colour in a cutting edge, moderate plan will have a totally different feel than a similar blue utilized as an accent colour in a more complex, corporate plan. Knowing the essential variety implications gives designers a strong premise on which to construct colour palette for any brand or item. It is crucial to understand that finding a reference image can do wonders to ease the process of finding the apt colour palette in terms of design.

The client as well as other stakeholders can easily give their inputs and those references can be used to create the fitting colour palette for a product or a site. Extraction of colours from a reference image can help reduce the manual work of finding the right tone of colours from an image and it can help focus on the other aspects of design. This work introduced and tested a

method for automatically extracting a colour palette from a set of digital images. Hence, the results of this implementation can be used in the design domain which can replace the manual process of finding the colour theme in a reference image. This in turn saves a lot of valuable time and resources.

For future work, a particular segment of the image can be selected and colour palette from that segment can be extracted which will give result to an even more detailed colour gradient.

7. REFERENCES

[1] Akcay O, Dalgin MH, Bhatnagar S. Perception of color in product choice among college students: a cross-national analysis of USA, India, China and Turkey. International Journal of Business and Social Science. 2011 Nov 1;2(21)

[2] Guthikonda SM. Kohonen self-organizing maps. Wittenberg University. 2005 Dec;98.

[3] Jahanian A, Vishwanathan SV, Allebach JP. Autonomous color theme extraction from images using saliency. InImaging and Multimedia Analytics in a Web and Mobile World 2015 2015 Mar 6 (Vol. 9408, p. 940807). International Society for Optics and Photonics

[4] Kim S, Choi S. Automatic Color Scheme Extraction from Movies. InProceedings of the 2020 International Conference on Multimedia Retrieval 2020 Jun 8 (pp. 154-163).

[5] Kiviluoto K. Topology preservation in self-organizing maps. InProceedings of International Conference on Neural Networks (ICNN'96) 1996 Jun 3 (Vol. 1, pp. 294-299). IEEE.

[6] Kohonen T, Kaski S, Somervuo P, Lagus K, Oja M, Paatero V. Self-organization of very large document collections. Helsinki University of Technology technical report. 2003.

[7] Lai P, Westland S. Machine learning for colour palette extraction from fashion runway images. International Journal of Fashion Design, Technology and Education. 2020 Sep 1;13(3):334-40.

[8] Pavan Kumar I, Hara Gopal VP, Ramasubbareddy S, Nalluri S, Govinda K. Dominant color palette extraction by K-means clustering algorithm and reconstruction of image. InData Engineering and Communication Technology 2020 (pp. 921-929). Springer, Singapore.

[9] Swasty W, Adriyanto AR. Does color matter on web user interface design. CommIT (Communication and Information Technology) Journal. 2017 Aug 1;11(1):17-24.

[10] Vettigli G. MiniSom: minimalistic and NumPy-based implementation of the Self Organizing Map

[11] Vitols G, Arhipova I, Hirata Y, Ikarts I. Colour Extraction and Analysis Solution for Design of Cross-cultural Websites. Procedia Computer Science. 2015 Jan 1;77:215-20.

[12] Yin H. The self-organizing maps: background, theories, extensions and applications. InComputational intelligence: A compendium 2008 (pp. 715-762). Springer, Berlin, Heidelberg.

SMART E-BOARD (AN IOT BASED DEVICE THAT CONVERT ORDINARY SWITCH BOARD TO SMART)

Amit Patel, Kunal Akhote, Mayank Gudadhe and Shilpa Bhalerao
AITR, Indore

ABSTRACT

As we see, the people always forgot to switch off Electrical appliances before leaving the rooms. This leads to unnecessary wastage of electricity as well as natural resources like coal, petroleum etc. We have built an IOT device that senses if no human is present in the room/classroom then the device automatically turns off the light and fan of the particular room/classroom. We have also added a feature that controls the fan speed according to the surrounding temperature. So in this way we will save lots of electricity and natural resources for our next generations.

Keywords: IOT- Internet of Things, Home automation, PIR- Passive infrared sensor, Arduino uno, Temperature sensor

8. INTRODUCTION

The Internet of Things (IoT), in recent years, successfully changed our daily lives to the point that everyone started to buy into the convenience, the comfort, and the valuable insights that it offers.

From connected home hubs, smart thermostats, remote door locks, sensor based bulbs and fans and all the various app-controlled appliances. We all know how IoT has changed our everyday life and introduced more comfort to our life .

The real truth is, IoT is growing in industrial use as well as everyday use. It is making our lives simple and easy in many forms, and it will likely continue to do so. In addition to the problems we know about, it's also solving problems we didn't even know existed—that is, until the solution magically appeared.

Energy consumption has become one of the major problems in the world. Power consumption plays a vital role in energy consumption. Sometimes the user forgets to turn off the lights and fans; the energy gets wasted. Hence there is a need for a power management system to save our electric power.

There are many IoT devices which are used to control home appliances like Amazon Alexa, Google smart home etc. These devices control the appliances with voice commands and provide comfort to the people but there are less chances to save electricity. There are certain devices which are automatically turned on/off by detecting human presence like bulb in the condition of bulbs in built Human sensor are fitted inside bulbs which detect human presence and automatically turn on /off bulb same scenario in the condition of fan. So in this case we have to purchase different devices for different purposes, there is a need for a single device that controls all the appliances in a room.

For solving this all problem we have made an IoT device that control all electrical appliances automatically on detecting human presence/motion this IoT device automatically manages fan speed according to surrounding temperature .

In following subsections, we will discuss literature review in Section II, in Section III, material used and Section IV we have discussed the Proposed method and In last section V conclusion is discussed.

2. LITERATURE REVIEW

IoT is has gained the tremendous popularity in last decade as abundance of data is collected from various sensor used in IoT. We have done literature review related to our work only. We briefly discuss work proposed and implemented by researcher in aforesaid area.

2.1. Home Automation Using Internet of Things

In This Paper We Present a Home Automation system(HAS) using Intel Galileo that employs the integration of cloud networking, wireless communication, to provide the user with remote control of various lights, fans, and appliances within their home and storing the data in the cloud. The system will automatically change the basis of sensors' data. Thissystem is designed to be low cost and expandable allowing a variety of devices to be controlled [1].

2.2. Automatic Speed Control and Turning ON/OFF for Smart Fan by Temperature and Ultrasonic Sensor

Keeratiburt Kanchanasatian in 2017 proposed A prototype of smart fan was built in this research using ESP8266 as a microcontroller, DHT22 and HC-SR04 are used to measure temperature for speed control and detect the user for automatic on/off respectively [3].

2.3. Automatic Fan Speed Control using Temperature and Humidity Sensor and Arduino

The project is based on the concept of the Internet of Things(IOT). A simple strategy to automatically control the speed of the fan using DHT22 sensor. According to the temperature sensed by the temperature and humidity sensor the resistance of the fan will be adjusted to change the fan speed. It's fairly straightforward to use, however, it needs a careful arrangement to grab information. DHT22, Arduino, and LCD will get power from the same fan connection, so that less battery power is used [6].

2.4. Smart Fan Speed Controller

Paper proposes a novel controller to control the speed wirelessly without much efforts. It comprises of an internet of thing (IOT) server that is interface with a controlling module to control the fan smartly, a monitoring device for monitoring the fan speed and temperature of room. The user can control the speed of fan by the help of user interface It is proposed by Jeevan Jyoti Mahakud, Arun Kumar Das[7].

Researcher also proposed the voice and gesture recognition smart system for smart home still all control on single device without touch is missing so we have attempted to develop the device integrated controls of light and fan on single board.

3. MATERIALS & METHODS

In our project we have used some IoT devices, sensors, relays and transistors with the help of this all devices we have made IoT device that single device control all the appliances automatically.

3.1. Arduino Uno R3

The Arduino UNO R3 is frequently used microcontroller board in the family of an Arduino. This is the latest third version of an Arduino board and released in the year 2011. The main advantage of this board is if we make a mistake we can change the microcontroller on the board. The main features of this board mainly include, it is available in DIP (dual-inline-package), detachable and ATmega328 microcontroller. The programming of this board can easily be loaded by using an Arduino computer program. This board has huge support from the Arduino community, which will make a very simple way to start working in embedded electronics, and many more applications.

3.2. PIR Sensor

A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view. They are most often used in PIR-based motion

detectors. PIR sensors are commonly used in security alarms and automatic lighting applications.

3.3. Temperature Sensor [TMP36]

The TMP36 is a low voltage, precision centigrade temperature sensor. It provides a voltage output that is linearly proportional to the Celsius temperature. It also doesn't require any external calibration to provide typical accuracies of ±1°C at +25°C and ±2°C over the −40°C to +125°C temperature range.

Component List

Name	Quantity	Component
U2	1	Arduino Uno R3
PIR1	1	-5.234588355368828 , -256.2878567183792 , -200.91055306529478 PIR Sensor
U4	1	Temperature Sensor [TMP36]
Bat1	1	4 batteries, AA, no 1.5V Battery
D2	1	Red LED
K1	1	Relay SPDT
R3 R1	2	1 kΩ Resistor
SW1 SW2	2	DIP Switch DPST
M1	1	DC Motor
BAT2	1	9V Battery
T1	1	NPN Transistor (BJT)
D1	1	Diode
C1	1	10 nF Capacitor

Fig. 1: Component Table

3.4. Relay [SPDT]

The SPDT Relay (30A) is a high quality Single Pole Double Throw Relay (SPDT). The Relay consists of a coil, 1 common terminal, 1 normally closed terminal, and one normally open terminal. When the coil of the relay is at rest (not energized), the common terminal and the normally closed terminal have continuity.

3.5. Resistor

A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses.

3.6. NPN Transistor (BJT)

NPN transistor is the most commonly used bipolar junction transistor, and is constructed by sandwiching a P-type semiconductor between two N-type semiconductors. An NPN transistor has three terminals– a collector, emitter and base. The NPN transistor behaves like two PN junctions diodes connected back to back.

3.7. Diode

Diode is an electrical component that allows the flow of current in only one direction.

3.8. Capacitor

A capacitor is a component which has the ability or “capacity” to store energy in the form of an electrical charge producing a potential difference (Static Voltage) across its plates, much like a small rechargeable battery.

4. PROPOSED METHOD

With the help of this all these material we made single IOT device in this device we are follow some methods:-

Step: 1

First we use Arduino Uno R3 which is the brain of an IOT device. The entire coding for controlling the sensors and appliances is done in arduino .

Step: 2

We have connected the temperature sensor and PIR sensor with arduino in parallel to that we have connected all electrical appliances of the room but PIR sensor detects only human in motion so to detect stationary body we have used a dc motor with PIR as shown in the figure below.

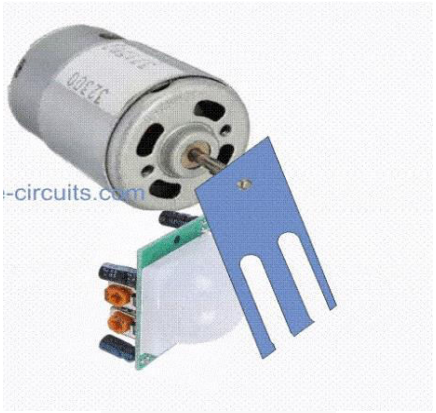


Fig.2: PIR Chopper

Image Source:

https://commons.m.wikimedia.org/wiki/File:PIR_Chopper_Circuit.gif

Step: 3

On the basis of input signal given by the PIR sensor and temperature sensor to the arduino, the arduino will generate respective output signals. So, the fans and bulbs turn on/off according to the signal and if there is rise and fall in temperature, the speed of the fan is also regulated**.**

We have arrange all components in proper manner as shown in circuit diagram so that all the task can be performed properly.

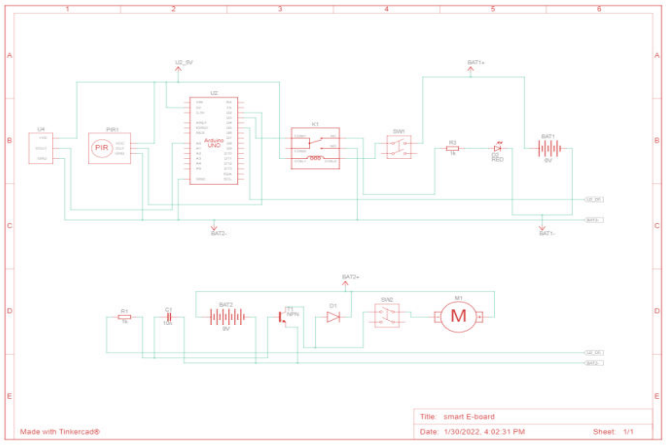


Fig.3: Circuit Diagram

* Finally our device is ready to use

* We can use this device by connecting it with an electric switch board for automating electrical appliances.

5. CONCLUSION

We are saving electricity and giving one way to sustainable development. We are also automating the process and automatically adjusting the fan speed according to room temperature. It is also easy and feasible for humans. Also save money as the electricity bills will get reduced. Future aspect are we can add some features that how many persons are there in the room and how many fans and lights are required to be on. We will be introducing data analytics part also to know the consumption statistics of consumed electricity.

6. ACKNOWLEDGMENTS

Our thanks to the faculty Prof. Anil Patidar and Prof. Nidhi Nigam of CSIT department ,AITR Indore for their guidance in development of the research paper.

7. REFERENCES

[1] Vinay sagar K N and Kusuma S M, Home Automation Using Internet of Things, International Research Journal of Engineering and Technology. Volume: 02 Issue: 03 Jan-2015 e-ISSN: 2395-0056 p-ISSN: 2395-0072.

[2] Rahul Godha, Sneh Prateek, Nikhita, Home Automation: Access Control for IoT Devices International Journal of Scientific and Research Publications, Volume 4, Issue 10, October 2014 ISSN 2250-3153.

[3] Keeratiburt Kanchanasatian, Automatic Speed Control and Turning ON/OFF for Smart Fan by Temperature and Ultrasonic Sensor, March 2018 ,IOP Conference Series Materials Science and Engineering

[4] L. Shkurti, X. Bajrami, E. Canhasi, B. Limani, S. Krrabaj and A. Hulaj, "Development of ambient environmental monitoring system through wireless sensor network (WSN) using NodeMCU and “WSN monitoring”," 2017 6th Mediterranean Conference on Embedded Computing (MECO), 2017, pp. 1-5, doi: 10.1109/MECO.2017.7977235.

[5] Basanta H, Huang Y P and Lee T T, Using voice and gesture to control living space for the elderly people, H. Basanta, Y. -P. Huang and T. -T. Lee, "Using voice and gesture to control living space for the elderly people," 2017 International Conference on System Science and Engineering (ICSSE), 2017, pp. 20-23, doi: 10.1109/ICSSE.2017.8030829.

[6] Suraj Kaushik, Yuvraj Singh Chouhan, Nagendra Sharma, Shreyansh Singh, P Suganya ,Automatic Fan Speed Control using Temperature and Humidity Sensor and Arduino, International Journal of Advance Research, Ideas and Innovations in Technology, VOl. 4, Issue 2

[7] Jeevan Jyoti Mahakud, Arun Kumar Das, Smart Fan Speed Controller, International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-8 Issue-11, September 2019

FARM MANAGEMENT SYSTEM

Aniket Nikumbh[1] and Dr. Suhasini Vijaykumar[2]
[1]MCA Student and [2]Professor, Bharati Vidyapeeth Institute of Management and Information Technology, Navi Mumba

ABSTRACT
The goal of the Farm Management System is to automate the existing manual system using computerized equipment and full-featured computer software to meet their needs, so that their valuable data/information may be saved for a longer period of time with easy access and manipulation. The necessary software and hardware are simply accessible and simple to use. As previously said, a farm management system can result in an error-free, secure, dependable, and quick management system. It might help the user focus on other things instead of maintaining track of their records. As a result, the company will be able to make better use of their resources. The company is able to keep computerized records without having to make duplicate entries. That implies you won't be distracted by irrelevant information while still being able to get to the information you need. Essentially, the project explains how to manage for good performance and better client services.

Keywords: Farm information, labour data, crops, insecticides, and pesticides data.

9. INTRODUCTION
Farm management is the process of determining and putting into action decisions about a farm's organisation and operation to maximise output and profit. The "Farm Management System" was created to overcome the issues that plagued the traditional manual system. This software is designed to avoid and, in some situations, lessen the difficulties that come with using a manual system. Furthermore, this system is developed to meet the company's need for smooth and efficient operations. To avoid data entry errors, the programmer has been kept as simple as feasible. It also displays an error message when invalid data is entered. The user does not require any formal knowledge in order to utilize this system. As a result, it demonstrates that it is user-friendly. As previously said, a farm management system can result in an error-free, secure, dependable, and rapid management system. It might help the user focus on their other tasks rather than maintaining track of their records. As a result, the company will be able to make better use of its resources. Every company, large or small, faces issues in maintaining information about crops, farms, insecticides, and other pesticides. As a result, it demonstrates that it is user- friendly. As previously said, a farm management system can result in an error-free, secure, dependable, and rapid management system. It might help the user focus on their other tasks rather than maintaining track of their records. As a result, the company will be able to make better use of its resources. Every company, large or sum all, faces issues in maintaining information about crops, farms, insecticides, and other pesticides.

10. LITERATURE REVIEW
Lazzari and Mazzetto (1996) proposed the Computed Farm Machinery System model (ComFARMS). It was created to look at the strategic and management aspects of mechanisation issues in Italian arable farms. It primarily focused on the strategic approach to multicropping agricultural machinery selection. After entering a crop rotation pattern and a list of operations for each crop, the user is presented with a machinery set (tractors and implements) in which each machine is classified by kind, quantity, and size. It's being included into a broader decision-support system to help farmers and consultants use it more effectively at the farm level.

One of the most essential success criteria for today's farms is well-planned management (Mishra et al., 1999; Muhammad et al., 2004). Only a well-managed farm can create the revenues necessary to finance its long-term development and, thus, its survival in today's rapidly changing world. A sophisticated management, on the other hand, is a difficult and time-consuming task that must be organised as efficiently as feasible (Forster, 2002; Doye et al., 2000).

The DSSAT4 Shell programme created a user-friendly working environment in which a variety of standalone tools and programmes could be smoothly connected with the DSSAT4 crop models. It gave the user the ability to run apps for creating and editing data files, running crop models, and analysing the results. As a result, the project has taken on a life of its own. In DSSAT, users can select any combination of management options for simulation of several crops for validation (comparison with observed data), seasonal analysis, and crop rotations. This menu-driven software prompts users to enter several elements existing on the current day, and then suggests management options for planting date and plant density based on those inputs. Fertilizer is a term that refers to the times, amounts, and types of fertiliser applications, as well as residues and other factors.

Churi *et al* (2013) created a system to examine decision support systems for supporting smallholder farmers in making strategic and tactical decisions to decrease climate risks and boost crop productivity in semi-arid environments. They created this DSS to improve communication among agricultural actors by using mobile phones and internet applications to access not only climate data directly from meteorological services, but also agricultural knowledge from other farmers, agricultural extension workers, and research institutions via a centralized database. The built database serves as a repository for agricultural data and knowledge about climate, markets, and agricultural inputs that are required for various farm-level decisions. The system attempted to combine climate forecasts, input availability, and strategic and tactical decisions to automatically generate and coordinate advice for farmers.

The prior method had a variety of issues. The process of storing, conserving, and retrieving data was incredibly time-consuming and arduous because the entire system required to be maintained by hand. The files were never organized in any logical order. Identifying each transaction with a specific context used to be quite difficult. If any information needed to be found, it would have to be extracted from a variety of registers and files; report generation would be impossible. It was always a waste of time when entering and retrieving records. Another problem was that detecting errors while entering data was incredibly difficult.

The Farm Management Method was developed in response to the problems that plagued the previous manual system. The Farm Management system keeps track of all information about farm produce, cost ranges, and other expenses including daily pay. All records related to agriculture, pesticides, and labour are merged. Farmers can compare their profit/loss from the previous year to the current year, which will be useful for the future cropping season. The Farm Management Method was developed in response to the problems that plagued the previous manual system. The Farm Management system keeps track of all information about farm produce, cost ranges, and other expenses including daily pay. All records related to agriculture, pesticides, and labour are merged.

11. METHODOLOGY

There are various methods to implement this type of applications. In our research we have systemized the methods which are already there to contribute this growing field.

These methods can be further divided into seven distinct steps:

11.1.1 Login/Signup.

In this paper used Login for allow the users to login on the website and application. · Applications/Websites identifies the users with their username and password and those have not accounted they can create account. which is built in HTML, CSS, JavaScript.

11.1.2 Add Farm Plot

Enter the plot information of farm such as farm name farm area is to be added on this page.

11.1.3 Add Crops

Here enter the farm name, the name of the crop and all the information about it are given and also the weather at the time of planting. The crop as well as supplementary information about it. This information helps in planting the next crop.

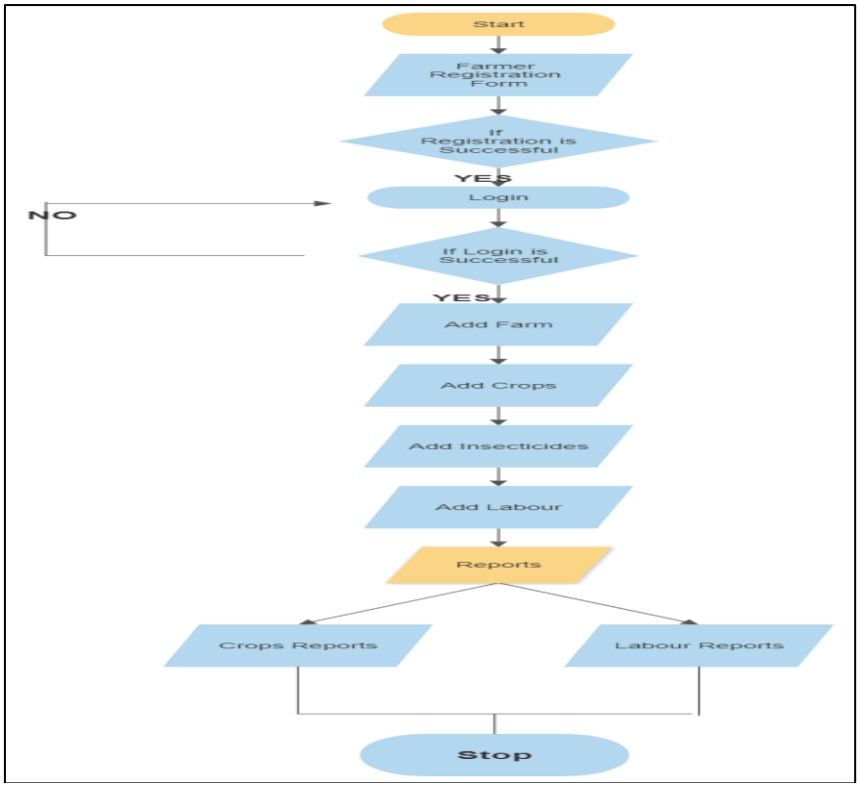


Fig 3.1 Flowchart of the system

11.1.4 Add Insecticides

In this research, the amount and name of pesticides sprayed on which crop, the quantity and the date of theday sprayed are to be given. It is also important to note the effect of the spray on the crop so that it can be used in the future.

11.1.5 Add Labour

Here the laborers are recorded, the type of work they get, the wages they get, the work for which the laborers were hired, it is also given here. There is also a classification of laborers as male and female because some jobs are paid differently to men and women.

11.1.6 Crops Report

Here is all the information about the crop which was given earlier at the time of planting This information determines the direction of the next crop Also, based on this information, you can know which crop is affordable or not. It can also trace its profit and loss.

11.1.7 Labour Reports

It gives all the information about how much labor was required for which work and in which farm plot they were paid.

12. IMPLEMENTATION

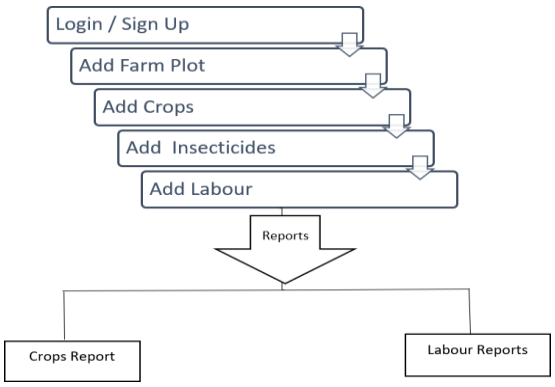


Fig 4.1: Workflow of the System

13. CONCLUSION

Our research shows that basic Farm Management System supply concrete with an appropriate general structure and fundamental functionality Farm Management System. When it comes to a real-world use on farms, however, many alterations must be done in order to appropriately reflect all production processes. With their complex farm structure and internal interconnections and synergy effects between internal production processes and services, this assertion is especially true for multifunctional farms.

A smart Farm Management System offers a number of benefits to the farmer. He is no longer completely reliant on his "gut feeling." He has the ability to swiftly recognize discrepancies between planned and actual business performance, allowing him to take corrective action sooner. He can also save time when it comes to gathering and arranging data that he needs to present to authorities. Overall, a well-designed Farm Management System can help a farm raise its total profit and so survive in today's fast-paced, highly competitive world.

14. REFERENCES

1) Doye, D., Jolly, R., Hornbaker, R., Cross, T., King, R.P., Lazarus, W.F., Yeboah, (2000): Case Studies - *Case Studies of Farmers*' Use of Information Systems, Review of agricultural economicsRAE, Vol. 22, no. 2, pp. 566–585

2) Kuhlmann, F., Brodersen, C. (2001): *Information technology and farm management: developments and perspectives, Computers and Electronics in Agriculture,* Vol. 30, no. 1, pp. 71–83.

3) *Farm management information systems:* A case study on a German multifunctional farm January2014 Ekonomika Poljoprivrede 61(2):441-453

4) Fountas, S., Blackmore, S., Ess, D., Hawkins, S., Blumhoff, G., Lowenberg-Deboer, J., Sorensen, C.G. (2005): *Farmer experience with precision agriculture in Denmark and US Eastern* Corn Belt, Precision Agriculture, Vol. 6, no. 2, pp. 121–141

5) Bryant, L. (1999): *Computers on the Farm. Farmers'* usage patterns and impact on farm management, Areport for the Rural Industries Research, RIRDC Publication, no. 99/13

VOICE RECOGNITION USING MEL FREQUENCY CEPSTRAL COEFFICIENTS IN PROCTORED EXAM

Ms. Krushangi Thamane and Dr. Priya Chandran
Department of MCA, Bharati Vidyapeeth's Institute of Management & Information Technology (BVIMIT), Navi Mumbai

ABSTRACT
Due to covid outbreak there were several changes in competitive examination system. Most of the exams were conducted online using proctored software to monitor the students. Since it is proctored, it is very easy to find anything fishy. However, the system will occasionally display a warning without any anomaly. This warning will be considered as cheating and the students will be stressed while giving the exams. In order to avoid this drawback, we have proposed a voice recognition method using MFCCC to display the warning based on the nearby sounds. The proposed method filters the noises and as a result, applicants can take their exam in a safe, secure, and relaxed manner.

Keywords: MFCCC, Proctored exam, online exam

1. INTRODUCTION
Within the field of computer science, voice acknowledgment could be a rapidly evolving approach. A voice acknowledgment framework is additionally utilized in different government tests. Applicants can take their exams and aptitude tests without fear of being warned unnecessarily. Mel frequency cepstral coefficients (MFCCC) and linear prediction cepstral coefficients (LPCC) are two common sets of characteristics that are frequently used in speech signal analysis (LPCC). Vector quantization (VQ), dynamic temporal warping (DTW), and artificial neural network (ANN) are three of the most popular recognition models. If there is any background noise on the applicant's side, the existing system will display a warning. These existing frameworks are not able to filter out the voice in an efficient manner. This study adds a few new features to the voice recognition system so that voice can be recognized in an efficient manner.

Applicant's can take their exams without fear of being warned. It collects applicant's voice input and stores it in a database. When the exam starts, the framework will calculate the frequency of any other person's commotion. In case the frequency is as well large, it'll compare the voice of the applicant and in case a coordinate is identified, it'll issue a caution that the applicant should not conversation.We too incorporate highlights such as somebody talks amid the exam, our framework will check whether it is related to the exam or not. In case somebody else is talking, it'll show a caution like "somebody is there".

2. LITERATURE REVIEW
Numerous programs, such as Google, Amazon, and others, utilize voice acknowledgment frameworks. During tests, a few organizations overused this application. In this stage, applicant is taking online tests from the comfort of their own homes. If there is any disturbance, the screen should display a warning. Surprisingly, there are too many distractions in this type of exam, such as activity, vehicle horns, or family discussions, therefore the framework will provide an alert. So, our system will collect certain information about the applicant, and also the applicant's voice, before to the exam. If applicant's voice is heard during the exam, the system will evaluate the frequency. If the frequency is too high, it will compare the voice to that of the applicant, and if the two do not match, it will determine if the voice is related to the exam or not. And if the frequency is too low, the voice will be ignored by the system.

The authors proposed different ways to mitigate the cyber security problems in online exams [1]. They have studied AI enabled and hybrid systems and proposed the features.In the authors studied and proposed different authentication mechanism to ensure integrity in online learning[2].In paper writer inquire approximately the calculation of voice recurrence[3]. withMFCCc and dtw procedures. So we've protected this spotlight in our framework.This framework can be actualized in any sort of device/OS like in android,windows, mac OS or linux also. In "Android Application with stage based on voice acknowledgment for competitive exam" composed by Sagar Agrawal etl[4]. Concurring to this term paper voice acknowledgment can be too perform in offline way as well. But it has chance of cheating. So our framework does not back without web.In "Hidden Voice Commands" .MFCC was used to track down the attackers' hidden voice. This study is based on black box testing[5]. In "voice conversion approach through feature statistical mapping" written by abdulbaset m. nasr[6]. The application of the well-known speech analysis technique, Linear Prediction, in this study proposes a straightforward parametric approach to vc(LP).

In "Audio Injection Adversarial Example Attack" written by xiaolei Liu ETL[7]. Investigate the subject of sparse perturbations in audio adverse instance attacks. In "speech processing: MFCCC based feature extraction techniques- an investigation" written by D.Prabakaranetl[8]. There are many applications in this digital world to protect and legalise their data, and all of these emissions are done using various ways, and there are numerous algorithms and methods to process their data. In "new electronic business reforming—Study on New voice based biometric security system" [9]. The security of technological gadgets that people use on a daily basis is becoming increasingly crucial. Exerts has explored a variety of methods to keep data and users safe from assaults in this area. As a result, our system necessitates a high-speed internet connection. The technology will save the user's voice by using the internet. It will also look at the frequency.

In "bio-inspired voice recognition for speaker identification" [10].The feasible advantages of adapting a biologically-inspired version of human auditory processing as a part of the front-cease of a SID machine are examined. This auditory version named Auditory Image Model (AIM) generates the stabilized auditory image (SAI). In "the processing of intimately familiar and unfamiliar voices: Specific neural responses of speaker recognition and identification" [11]. In "Voice Activity Detection and Garbage Modeling for a Mobile Automatic Speech Recognition Application" [12]. The main goal of this thesis project is to improve a speech recognition product held by a Finnish firm that specializes in industrial ASR solutions. The construction of a new acoustic model, refinement of the current VAD module, and trash modeling of OOV words are three activities that contribute to upgrading an existing ASR system. In "DAAR: New Software for Studying Voice Parameters in People with Cochlear Implant" [13].Speech electro-acoustic analysis is a valid support instrument for implanted patient evaluation, in our experience, because it is likely to provide objective and verifiable data on the actual variation of cochlear-implant-related supra-segmental features, which, thanks to new technological research, allows us to carry out a spectral and temporal analysis as close as possible to that of normal-hearing. Database network is required to store the applicant's voice data. Since the framework must spare the applicant's voice in .wav organize. The framework must spare the voice in content organize whereas checking other voices. Since it'll check whether or not another voice coming from the applicant's side is connected to the exam. To identify the voice, this system uses python and counterfeit insights innovation.

3 METHODOLOGY

Python is used implement the proposed system. We have used the MFCC technique in our proposed research work to filter the voice.

3.1 Proposed Frame Work:

The primary page of the framework is the applicant login page. Whereapplicants ought to put login accreditations. In case login is fruitful at that point it'll divert to an Information page where the applicant needs to select data like resume, and a few other individual data like applicant's voice. These all points of interest will store within the database.

The applicant's voice will store in .wav arrange. After that exam will start. In the event that login isn't effective at that point after 5 endeavors user's account gets blocked. Amid the exam, in case any clamor comes from the applicant's side at that point the framework will check the recurrence of that commotion. If the frequency is low, the exam will proceed; if the frequency is high, the framework will compare that voice to the applicant's voice. In case it's applicant's voice at that point the framework will appear a caution. In case it's not the applicant's voice at that point that clamor will change over in content organize and after that the framework will check the detail is related to the exam If its exam related then system will show warning otherwise exam will get continue. If warning count is greater than 3 then exam will get automatically shut down.

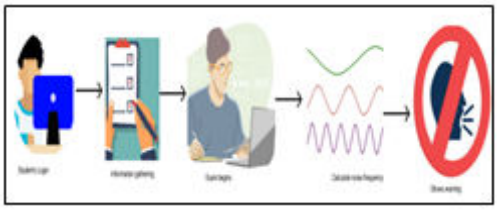


Figure 1: Work flow

3.2 MFCC

The proposed framework uses Mel-Frequency Cepstrum(MFCC) technique to extract features of sound. The MFCC could be a representation of an really sounds short-term control range based on a straight cosine change of a log control range on a nonlinear mel scale of recurrence utilized amid sound processing. The difference between cepstrum and mel frequency cepstrum is that within the MFCC, the frequency bands are located further apart on the mel scale. This is more closely matched to the human auditory response than the linearly spaced frequency bands used within the normal spectrum. This frequency distortion allows, for example, to achieve better sound instances with audio compression.The Melrecurrence cepstral technique's street outline is shown in figure 2.

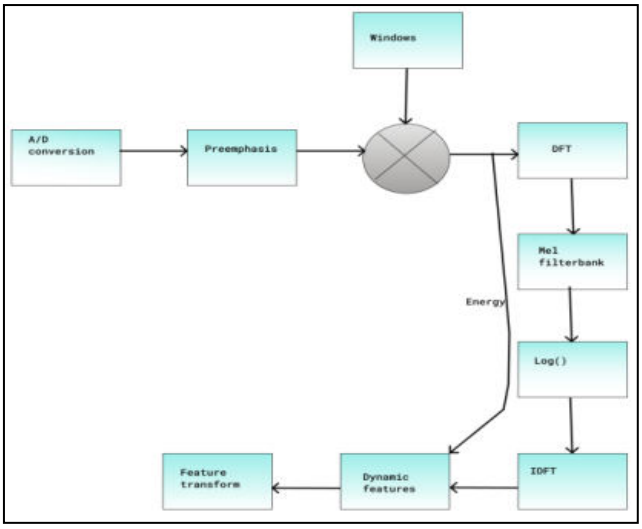


Figure 2: MFCC steps

MFCC calculation is discussed below:

Step 1: A/D Transformation In this arrange, we'll change over our analog sound flag to advanced organize utilizing an 8kHz or 16kHz testing recurrence .

Step 2: PreemphasisThe amount of vitality within the higher recurrence is expanded by preemphasis. When we look at the recurrence space of an sound flag for voiced segments such as vowels, ready to see that the vitality at higher frequencies is altogether littler than the vitality at lower frequencies. Expanding the vitality at higher frequencies progresses the phone discovery exactness, which moves forward the model's execution.

Step 3: Windowing The objective of the MFCCC method is to extricate highlights from an sound stream which will be utilized to distinguish phones in discourse. Be that as it may, since there will be a few phones within the given sound flag, we are going separate it into distinctive portions, each of which can be 25ms wide and dispersed 10ms separated. With four phones and three states each phone, a individual can express three words per moment, coming about in 36 states per moment, or 28 milliseconds per state, which is near to our 25-millisecond window.

Step 4: DFT (Discrete Fourier Transform) Thedft transform will be used to convert the signal from the time domain to the frequency domain. The frequency domain is easier to analyse than the time domain for audio signals.

Step 5: Mel-Filterbank The manner our ears interpret sound differs from the manner machines do. At decrease frequencies, our listening to have higher decision than at better frequencies. So, if we listen noises at 2 hundred Hz and three hundred Hz, we are able to without problems distinguish them from sounds at 1500 Hz and 1600 Hz, regardless of the truth that they vary through a hundred Hz.

Step 6: Energetic Highlights In expansion to these 13 highlights, the MFCCC approach will take under consideration the primary and moment arrange subsidiaries of the highlights, coming about in a add up to of 26 features.

The detailed flowchart of the proposed system is depicted in figure 2.

Flow Chart:

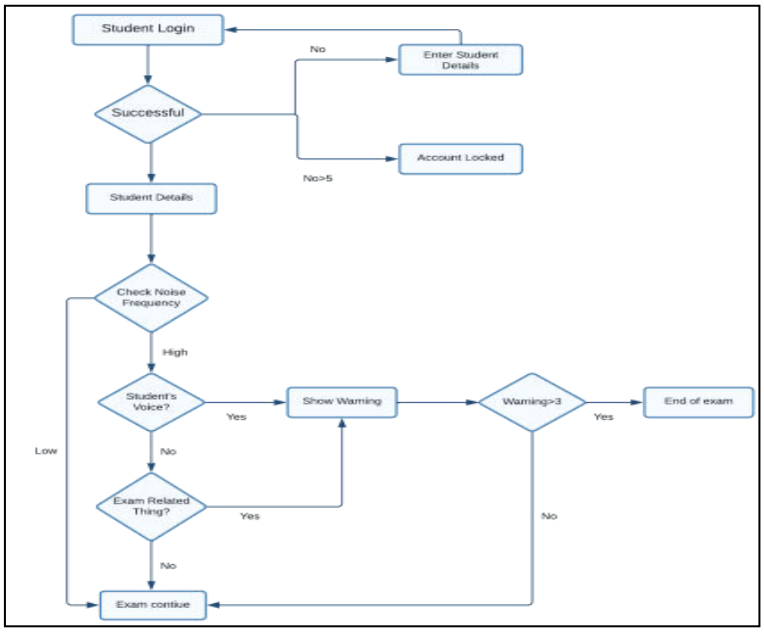
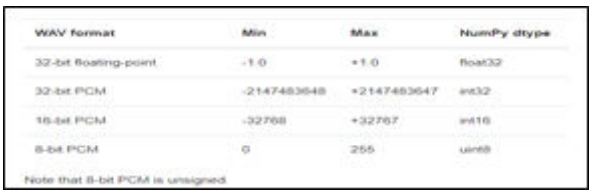


Figure 3: Flowchart of the proposed method

4. **Implementation:**

We have used python libraries to implement the proposed method.NumPy,is a library of multidimensional array items and a set of workouts for manipulating the ones arrays. This is a library including a set of multidimensional array items and array manipulation workouts.The maximum vital item described in NumPy is an N-dimensional array kind referred to as ndarray. It describes the gathering of objects of the equal kind.Each detail of the ndarray is the identical length because the block in memory. Each detail of the ndarray is an item of a statistics kind item (known as a dtype).

The following determine indicates the connection among ndarrays, statistics kind objects (dtypes), and array scalar types. Instances of the ndarray elegance may be created via way of means of the diverse array introduction exercises defined later on this tutorial frames.



WAV format	Min	Max	NumPy dtype
32-bit floating-point	-1.0	+1.0	float32
32-bit PCM	-2147483648	+2147483647	int32
16-bit PCM	-32768	+32767	int16
8-bit PCM	0	255	uint8

Note that 8-bit PCM is unsigned.

Figure4: Sci-py Wav format [14]

The audio signal is constantly changing, so for the sake of simplicity, let's assume that the audio signal doesn't change much on a short timescale (when we say it doesn't change, it's statistically, or statistically stationary. Obviously the sample is short but constantly changing timescale). For this reason, the signal is framed in 2040 ms If it is long, the signal will vary significantly throughout the frame. The Mel scale buddies the perceived frequency or pitch of a natural tone with the frequency clearly measured.

The method for changing from frequency to Mel scale is:

$$mel(frequency)=1127\ln(1+frquency/700)$$

where, mel() = output of voice
ln() = log method

Figure 5: method for changing from frequency to Mel scale

To pass from Melsagain to frequency:

$$1/m(m)=700(\exp(m/1125)-1)$$

Where m=males

Figure 6: To pass from Melsagain to frequency

Mel filterbanks are used to provide better resolution at low frequencies and lower resolution at high frequencies.

This is a tough and speedy of 20-40 (26 is standard) triangular filters that we exercise to the periodogram strength spectral estimate. Each vector is extra frequently than now no longer zeros, however, is non-zero for a certain segment of the spectrum. To calculate filterbank energies we multiply each filterbank with the strength spectrum, then add up the coefficients. Once this is executed we are left with 26 numbers that offer us an indication of the manner heap selectricityend up in each filterbank. Here is a plot to with a bit of luck easy subjects up:

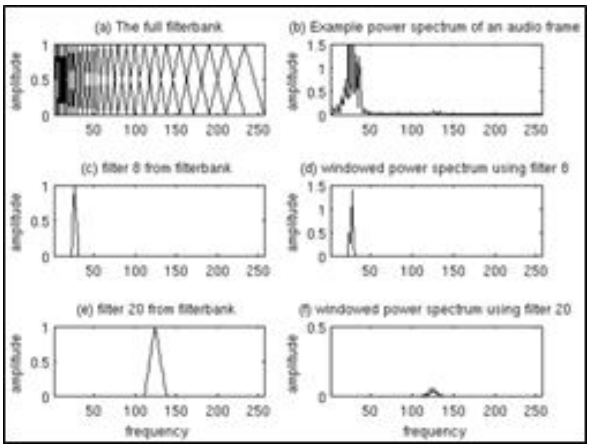


Figure 7: Plot of Mel Filterbank Mel filterbank[15]

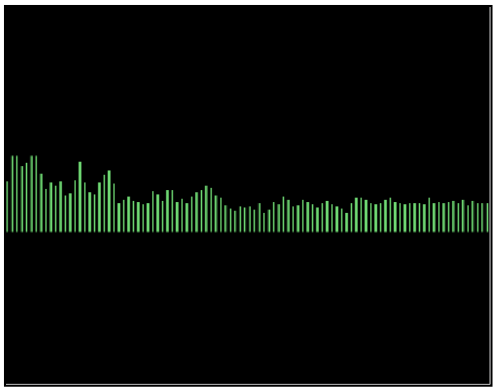


Figure: 8(a)

Figure: 8(b)

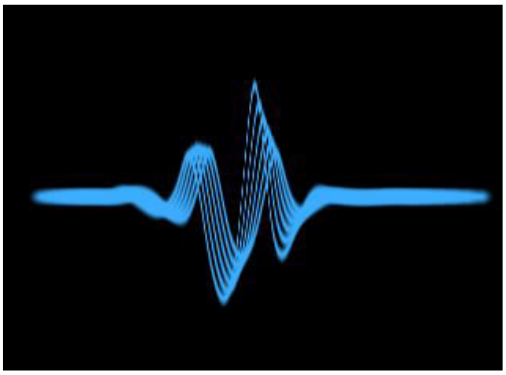


Figure: 8(c)

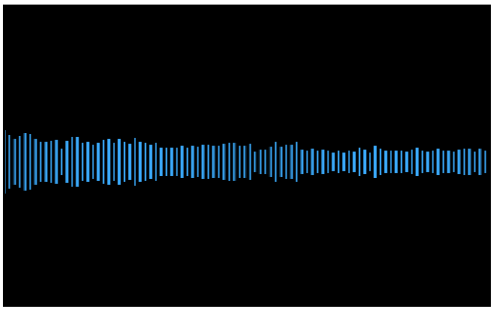


Figure:8(d)

Figure 8(a) – (d): original sound wave experiments in hz:

Since the framework requires a record in wave format, our proposed method also requires the transformation of a sound record to wav format. we have incorporated built-in converter for sound to wav format.

5. RESULTS AND DISCUSSIONS

From this studieswe'recapable oflocate following results. If supply is a long way away then it'll generate wave and histogram outputs in figure 9[a]-[b]. If supply is close tothrough then it'll generate simplest histogram results in figure 10.

The frequency calculator's results are listed below. If Student voice does not match then system calculates frequency of another voice. The following are the findings when the system calculates the frequency of any other voice.

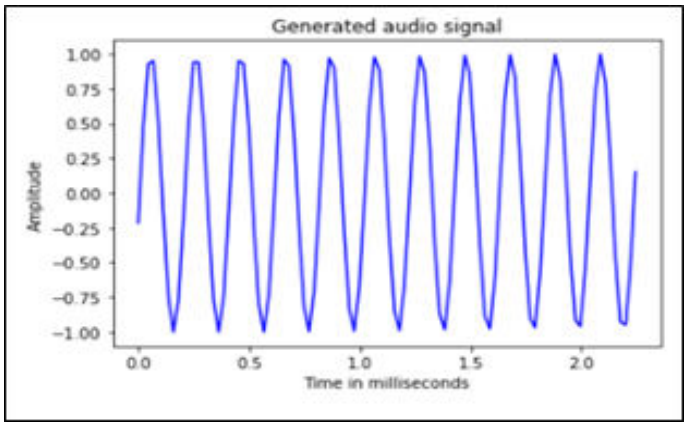


Figure 9(a): sound wave (source far away)

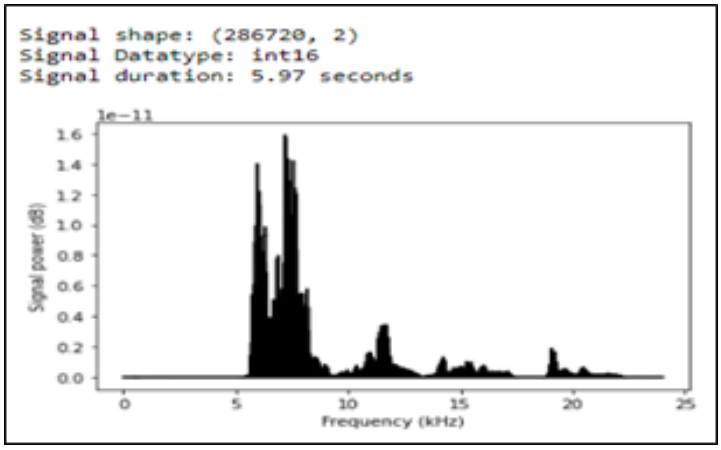


Figure 9(b): sound wave (source faraway)

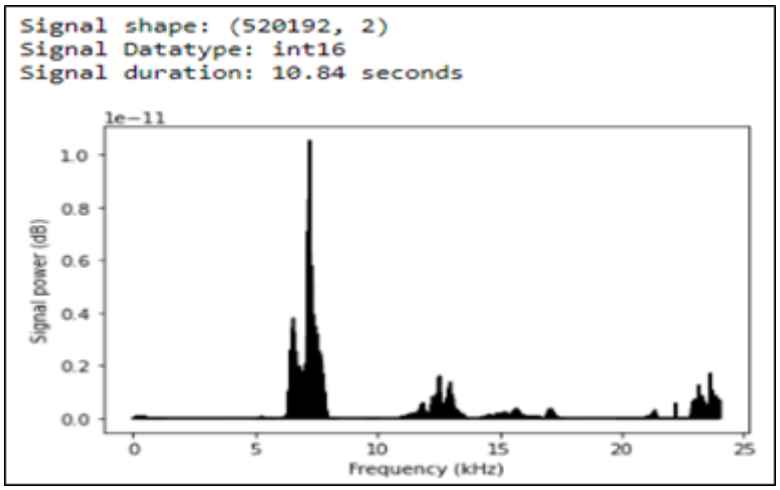


Figure 10: sound wave (near by)

6. CONCLUSION

Due to increase in online classes and its popularity after covid outbreak, online exams are very common now. In this research paper we have studied about online proctored exams and proposed a system to recognize voice using MFCC approach so that the applicants can take their exams and aptitude tests without fear of being warned unnecessarily. The proposed system is able to determine frequency over a wide range of frequencies and translate voice to text. We would like expand our study by adding a converter that stores sound recordings in wave format.

REFERENCE

[1] Slusky, Ludwig. "Cybersecurity of online proctoring systems." *Journal of International Technology and Information Management* 29.1 (2020): 56-83.

[2] Lee-Post, Anita, and Holly Hapke. "Online learning integrity approaches: Current practices and future solutions." *Online Learning* 21.1 (2017): 135-145.

[3] Iwana, Brian Kenji, VolkmarFrinken, and Seiichi Uchida. "DTW-NN: A novel neural network for time series recognition using dynamic alignment between inputs and weights." *Knowledge-Based Systems* 188 (2020): 104971.

[4] Suhartono, Derwin, et al. "Implementation of Voice Recognition Technology on English Learning Application by Self Learning Based on Android Device." *Prosiding SNST FakultasTeknik* 1.1 (2013).

[5] Grotto, A. J. "Vulnerability Disclosure and Management for AI/ML Systems: A Working Paper with Policy Recommendations." *ML Systems: A Working Paper with Policy Recommendations (November 15, 2021)* (2021).

[6] Nasr, Abdulbaset M. *Voice Conversion Approach Through Feature Statistical Mapping*. Diss. Universiti Putra Malaysia, 2001.

[7] Liu, Xiaolei, Xingshu Chen, Mingyong Yin, Yulong Wang, Teng Hu, and Kangyi Ding. "Audio injection adversarial example attack." In *ICML 2021 Workshop on Adversarial Machine Learning*. 2021.

[8] Prabakaran, D., and S. Sriuppili. "Speech processing: MFCCC based feature extraction techniques-an investigation." *Journal of Physics: Conference Series*. Vol. 1717. No. 1. IOP Publishing, 2021.

[9] Luo, Tianyi. "New Electronic Business Reforming—Study on New Voice Based Biometric Security System." *Journal of Computer and Communications* 6.12 (2018): 171-183.

[10] Iliadi, Konstantina (2016) Bio-inspired voice recognition for speaker identification. *University of Southampton, Doctoral Thesis*, 203pp [11] Plante-Hébert, Julien, Victor J. Boucher, and BoutheinaJemel. "The processing of intimately familiar and unfamiliar voices: Specific neural responses of speaker recognition and identification." *Plos one* 16.4 (2021): e0250214.

[12] Ishaq, Muhammad. "Voice activity detection and garbage modelling for a mobile automatic speech recognition application." (2017).

[13] Di Stadio, A., and D. Lazzaro. "DAAR: New Software for Studying Voice Parameters in People with Cochlear Implant." (2012).

[14] Mahadik, Miss Yogita S., and Mahesh T. Kolte. "A Review on Python Programming For Speech Processing of Hearing Aid."

[15] Davis, Steven, and Paul Mermelstein. "Comparison of parametric representations for monosyllabic word recognition in continuously spoken sentences." *IEEE transactions on acoustics, speech, and signal processing* 28.4 (1980): 357-366.

 ISBN: 978-81-19477-18-0

AUGMENTED REALITY IN MEDICAL EDUCATION: AREVIEW

Dr. Suhasini Vijaykumar and Abhishek Malpote
Department Master of Computer Applications Bharati Vidyapeeth's Institute of Management and Information Technology Navi-Mumbai

ABSTRACT
Learning within the medical domain is to an outsized extent workplace learning and involves mastery of complex skills that need performance up to professional standards within the work environment. Since training in this real-life context is not always possible for reasons of safety, costs, alternative ways are needed to achieve clinical excellence. Education Technologies most specifically Augmented reality has the ability to offer a realistic learning experience with respect complex medical learning and transfer. Our paper gives a comprehensive view on how augmented reality has brought a drastic change in the field of medical science and how it also plays an immense role in the learning and training process of the practitioners in order to gain excellence through practical knowledge. The paper consists of different sections from introduction to AR, it's working and applications along with the challenges and future scope.

Index Terms: *Augmented Reality, Healthcare, Education, Medical Training.*

1. INTRODUCTION
Augmented reality is a technology that allows a combination of real and virtual world, real time interaction and a 3d accurate registration of virtual object. The main motive of Augmented reality is to blend the components of the digital world with the person's perception of the real world. In 1968, Ivan Sutherland also known as the "father of Computer Graphics "created the first AR which was a head mounted display called as "The Sword of Damocles". The fundamental idea behind the three-dimensional display is to present the user with a perspective image which changes as he moves. The retinal image of the real objects which we see is, after all, only two-dimensional. Thus, if we can place suitable two- dimensional images on the observer's retinas, we can create the illusion that he is seeing a three-dimensional object. [1]. Since then AR has evolved to a larger extent, due to the growth in the digital world Augmented reality now-a-days can be experienced into handheld devices like smart phone, tablets etc. as a alternative of the previous learning techniques by exchanging the chalk/chart diagrams with a 3D model which provides a better UI and good learning experience.

In the given paper we are going to take a comprehensive view on how AR has evolved in the educational domain most specifically in the medical education and training field due to its flexibility in the physical and virtual environments. We are also going to take a view on what are the various AR Technologies currently applied in the medical science field and also what are the challenges faced to implement this type of technologies in the organisation and the future scope.

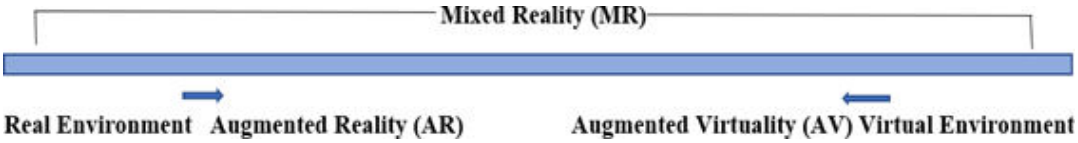


Fig. 1: Augmented Reality Conceptual diagram

2. LITERATURE REVIEW
Augmented reality is the enhancement of real physical world that is achieved with the help of digital visual elements, sound and sensory stimuli delivered through technology. In 1968, Ivan Sutherland, a Harvard Professor and a Computer Scientist also known as the "Father of Computer Graphics ", created the first head-mounted display which enabled user to take a 3D

view of any object as the user moves by using ahead positioning sensor and window clipping task [1]. Since then, AR is being playing a vital role in various industrial sectors, most significantly it has acquired a wide scope in the field of medical education and training.

1) Christoph Bichlmeier, Stuart Holdstock, Sandro Michael Heining MD, Simon Weidert MD, Simon Weidert MD, Oliver Kutter1, Nassir Navab1(2009) performed Con- textual In-Situ Visualization for Port Placement in KeyholeSurgery. [2]

This study aims to measure firstly the potential of using an AR system to assist placing ports for an operation correctly and secondly its potential as an educational training tool. The results of the experiment show that the augmented view into the patient can help with positioning and arranging ports for three different minimally invasive interventions.

2) Poshmaal Dhar, Tetyana Rocks, Rasika M Samaras- inghe, Garth Stephenson Craig Smith (July,2021) did a research on how Augmented reality is helping the student to achieve great learning experience. [3]

The research focuses on how AR has a wide spread in the education domain by providing great learning experience to the students along with hands on practices, specially in this pandemic situation where AR base learning has been a great approach to the students from the medical sector who requirea lot of practice to gain that expertise and knowledge.

3) Christian Moro, Zane Stromberga, Athanasios Raikos, Allan Stirling (March 2017) has provided a re- search report on the effectiveness of VR and AR in Health Science and Medical Anatomy. [4]

The given report descriptive analysis of how the use ofAR and VR to teach the medical practitioner's the subjectof Anatomy as it is the beginning of a medical course inorder to provide the knowledge of four main areas like gross anatomy, neuroanatomy, histology, and embryology in orderto reduce its learning time as it is considered to be a time consuming.

4) Keynes Masayoshi Kanno, Edgard Afonso LamounierJr., Alexandre Cardoso (March 2018) has created a mo- bile application to help the individual diagnosed with Alzheimer to identify objects and people. [5]

The given research comprises of an application developed through AR which helps the people who are diagnosed with Alzheimer to identify people and objects, also to track their location which uses a speech command for different features such as time remainder for taking medicine and identification of which medicine to be taken.

5) Eysin Chew, Selangor Darul Ehsan, Pei Lee Lee, Weng Han Ho(2018) carried out a research on how AR is enhancing the nurses-physician communication after hours with the help of the Google glass. [6]

Effective communication is very crucial in the healthcare environment as the patient life is total dependent on it, so any sort of lacking communication between the nurses-physician may have adverse effect on the patient health. The given report suggests Google Glass as a solution to this problem which helps the nurses and physician to get exact report of the patient's health, specially in terms of afterhours communication.

6) Austinn C. Miller and Travis W. Blalock(2020) in their research paper Augmented reality: a novel meansof measurement in dermatology has explained how AR is being a helpful as measurement tool in dermatology [7].

The size of Cutaneous lesions is an important factor in dermatology. A variety of technology-based measuring instruments has been developed in order to measure cutaneous lesions, but most of them are costly and time consuming hence in the given research an smartphone AR

based application named "Ruler" is been used to get the size of lesions. As a result of the research AR was found to be the most effective measuring tool due to its unique advantages over traditional ways of measuring.

7) Thomas Kilgus , Eric Heim, Sven Haase, Sabine Prüfer, Michael Müller , Alexander Seitel , Markus Fangerau, Tamara Wiebe, Justin Iszatt, Heinz-Peter Schlemmer ,Joachim Hornegger, Kathrin Yen, Lena Maier- Hein(2014) carried a research on Mobile markerless aug- mented reality and its application in forensic medicine.[8]

Forensic science mostly distinguishes between the natural and non-natural causes of death in case of unknown death and thus contribute to the detection and solving of crimes. The pathologist mostly carries out autopsy(post-mortems) but CT scans before autopsy is a standard practise. The given paper comprises of a hardware setup that provide physician with direct on patient visualization of CT or MRI and allow him/her to switch the viewpoint in real time to obtain anoverview.

8) Kwok-Fong Chan1 , Jun-Jie Poh1 , Wei-Ling Wu1 and Samuel Ken-En Gan(2020) carried out a research on AR is helpful in antibody interaction. [9]

The given research describes how AR can be used for antibody interaction due to its 3d visual support and image depth. The research focuses on how AR can be implemented in visualization of three-dimensional antibody structure using mobile devices which allows an on-the-go convenient visual appreciation of the antibody elements. Without the constraints of printed space, antibodies are no longer limited to fragments or partial views but instead allows for a holistic view of whole or multiple antibodies (e.g. see IgE, IgM, IgA, IgG,and IgD in the AR).

9) Sanne M. B. I. Botden, Jack J. Jakimowicz(2009)carried a research on how AR is been used in Laparoscopicsimulations. [10]

Surgical Sectors is one of the most crucial sectors in healthcare. It requires accurate knowledge and experience in-order to perform on a real human. Thus to train the practitioners the given research comprises of seven laparoscopic simulators developed using AR that are foundto be beneficial for the training purpose.

10) Athanasios Christopoulos, Nikolaos Pellas, Justyna Kurczaba and Robert Macredie(2021) has written a re- search on how AR supported instructions are helpful in tertiary level medical education. [11]

The given research includes a comparative study if the educational impact and training satisfaction of AR-supported instruction vs the traditional teaching approach used in the field of medical education. As a result of which the interaction of 3d interactive content using students smartphone overcome the drawback brought by the online teaching learning practises.

11) S.R.Kamel Tabbakh, R.Habibi, ,S.Vafadar(2015) carried out a research on AR based framework is been used in Phobia Treatment Applications. [12]

Phobia is a psychological disorder where patient have extreme towards an object, creature or situations. The given paper comprises of a framework including hardware and software to apply AR in Phobia treatment with step-by-step design and implementation of the same.

12) Ta-Ko Huang, Chi-Hsun Yang, Yu-Hsin Hsieh, Jen- Chyan Wang, Chun-Cheng Hung has written a review article on Augmented reality (AR) and virtual reality (VR) applied in dentistry. (2018) [13]

Oral health is a common problem in elderly people as well as children. As per WHO approx. 60 percent of children and nearly 100 percent of adults have oral problems in their lifespan.

Dentistry thus has become a majorly growing sector. According to the research AR and VR has a wide future of dental OSCE (Objective Structured Clinical Examination) that allows students to practice and demonstrate their skillsin a standardized medical scenario.

13) Feng Yu1, Enmin Song, Hong Liu1, Yunlong Li2, JunZhu1,Chih-Cheng Hung(2018) carried a research on An Augmented Reality Endoscope System for Ureter Position Detection. [14]

Iatrogenic injury of ureter in the clinical operation may cause the serious complication such as kidney damage. To avoid such incidents, it is necessary to provide the ureter position to the doctors. The paper presents a AR based approach to display the ureter position to get an accurate position of the ureter and avoid the ureter damage during the surgery using methods like Bright and dark frames detection based on aided hardware (BDAH), Monochrome channel filtering algorithm (MCFA) and automatic region growingalgorithm (ARGA).

14) Kyle W.Law, Khaled Ajib, Felix Couture, Come Tholomier, Helen Davis bondarenko etc(2018), Use of Accuvein AV400 During RARP: an infrared augmented reality device to help reduce abdominal wall hematoma. [15]

Abdominal wall hematoma is a common complication that occurs during laparoscopic surgery due to the insertion of trocars which increases the patient's anxiety reduce the overall surgical satisfaction. In the given research AccuVein AV400 system was used to generate real-time images of venous structures beneath the skin. The results were found to be beneficial as the pre- incisional use of AccuVein system in men who undergone robot assisted radical prostatectomy (RARP) reduced the rate of AWH from 8.8percent to 2.6percent as compared to traditional port adjustments.

15) Kevin S. Tang, Derrick L. Cheng, Eric Mi, Paul B. Greenberg(2020) written a review on Augmented realityin medical education: a systematic review. [16]

In the given review paper a literature search was conducted g PubMed, Embase, Web of Science, Cochrane Library, and Google Scholar. PRISMA guidelines where followed in the review and included the publications from January 1, 2000to June 18,2018. These findings were used to formulate an analytical model to assess the readiness of ARAs for implementation in medical education. The result of which 100,807 articles where identified out of which 36 met the inclusion criteria that were categorized into 3 categories Surgery (23), Anatomy (9), and Other (4).

3. APPLICATIONS OF AUGMENTED REALITY

A. Augmented Reality in Surgeries:

The surgical sector is one of the most crucial sector in medical science as it requires a lot of experience knowledge ofthe same. Such type of procedures heavily relies on imaging. AR due to it's potential to superimpose and create a 3d virtual view has revolutionize the way surgeons plan and perform the surgical procedures. [17] [18] [19] Rafael Grossman in 2013 carried out the first surgery with the help of Google Glass, however it failed to catch the mainstream market. In 2020 University of Pisa claimed that the world's first augmented reality guided surgery had taken place at the Sant'Orsola hospital in Bologna, under lead surgeon Giovanni Badiali. [20]

B. Education and Training:

Augmented reality has evolved to an extent where now- a-days it can be experience through smartphones which has brought a dynamic change in the Education sector most specifically during the pandemic. [21] As the medical domain is prone to hands on practical's in order to reach that level of expertise Augmented reality is been playing a vital role in training and

educating the practitioners as well as the students as it is capable to provide a good learning experience with hands on practice. [22]

C. AR in Personalized Nanomedicine (PNM's):

Personalized Nanomedicines is a growing trend in the medi-cal sector for an efficient treatment on cardiovascular diseases, sexually transmitted diseases and various cancers.Doxil is the first nanomedicine approved by FDA in 1995 for AIDs Treatment.Among all the advanced technologies AR has the potential to tackle the challenges facilitate the translations PNMs into clinical application for personalized therapy. [13].

4. HOW AUGMENTED REALITY WORKS:

An efficient Augmented Reality device or application is made by combining the basic components used in AR tech- nology which includes display units, tracking module, portable devices such as computer or mobile phone etc. and different scanning algorithm. Beside this it also it also makes use of high-resolution cameras, high speed processer's, sensors like gyroscope pressure sensors and rotation sensors which helps to increase the reliability and performance of the device. [24] An AR framework is composed of six modules which are integrated and should act in real time performance. It is a time-consuming process thus should be integrated with best algorithms like SLAM (Simultaneous Localization and Mapping) [25] in order to reduce the processing time [26]. The Six modules are as follow:

1) **Marker Recognition:** With the help of this module, we can recognize position and the orientation very quickly. It commonly uses colour-band and polka-dot marker. [27]

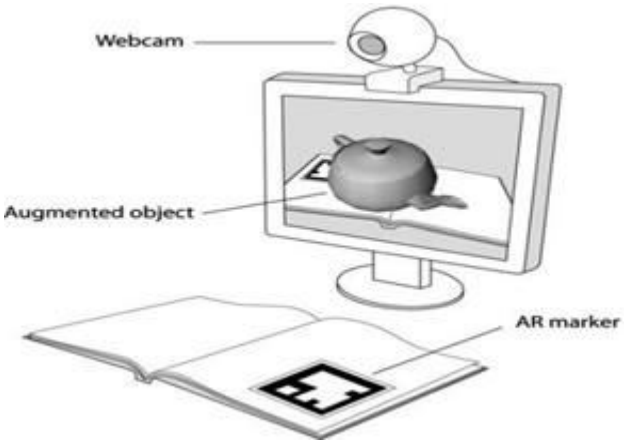


Fig. 2: Marker recognition using polka dots

2) **Object Registration:** These are tools, such as motion sensors and accelerometers, that allow a computer to define the space where it would superimpose or place the sensory information or the objects around the AR user. It involves frameworks like ARKit which helpto implement the computer vision algorithms to do tracking and mapping.[28]

3) **Occlusion Handling:** AR is basically an overlayed image superimposed on the real camera image, so toget a realistic image the augmented patterns must be properly occluded by the foreground objects.[29]

4) **Tracking and Gesture Recognition:** Usually the interaction between the user and the computer takes place through physical controller such as mouse, keyboard which acts as a strong barrier between user and virtual reality application there are many hand-tracking devices available as substitutes of these input devices.eg (bench glove sensors).[30]

5) **Collision Detection and Interactive Selection:** Augmented reality and Virtual reality uses the concepts of Physics to obtain the realism needed for it. But it is limited to the

collision and event action based onthe intersection to select a 3D model for manipulation function.[31]

6) **Visualization:** In order to make composition of AR rendered images AR visualization is a blended between captured camera image and computer graphics which uses data integration techniques like depth perception, augmenting pictorial depth cues Occlusion handling.[32]

The six modules discussed above, integrated to buildthe framework or an AR system are as shown in the Figure below.

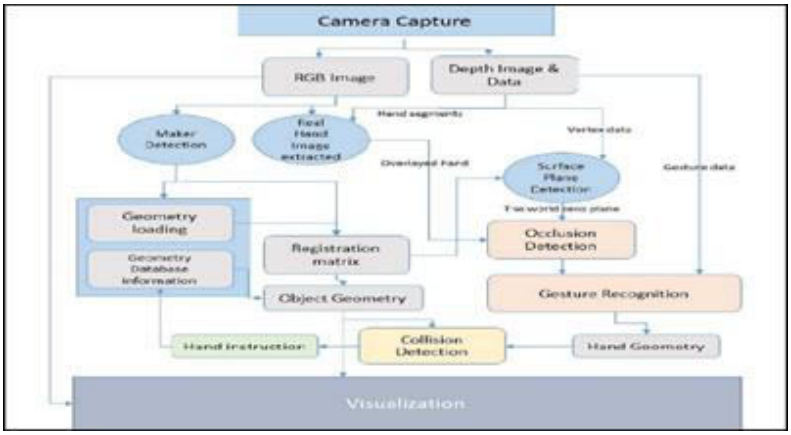


Fig. 3: Framework of Augmented Reality based Machine

5. CHALLENGES AND FUTURE SCOPE

Despite having such a wide benefit and scope AR stillhas several challenges and issues that needs to be addressed. Besides the social acceptance AR has to deal with a huge amount of data/information in reality, thus it needs a software to filter the information and retain useful information as well as discard the useless data which is rather a time-consuming process.

Therefore, the hardware used to build this technology should be compact, easily portable and fast enough to display the graphics. The Battery life used to design such complicated devices is one of the major challenges as well. On the other hand, the implementation of such application is very expensive thus a lot of healthcare organizations are still facing problems in developing such systems. Also, the use of GPS to provide accurate markers ask them to be reliable and accurate [33]

[34].Even with these challenges we can't deny the fact that the growth and need for augmented reality is increasing in various industrial, educational and other domains. As per a current report the market size worth of AR and VR will be 252.16 Billion Dollar by 2028. [35]. out of which the Healthcare domain has a market size of 2.22 Billion Dollar up till 2022 and might reach up to 9.02 Billion Dollar till 2027.

6. CONCLUSION

The use of AR technology in medical education is in its early stages presently lacks evidence-based support forits widespread implementation. Future research should adopt long-term and large-scale or cohort study designs. Rigorous and standardized validation of commercially viable applica- tions will allow the technologies to be more readily integrated into medical educational curriculum. The given paper gives an overall view on the potential of Augmented reality in the field of medical science and also helps us to know of how Augmented reality is used in different medical sectors for the purpose of conveying complex information in accurate manner and in the training of medical practitioners in order to gain expertise in their respective sections.

7. REFERENCES

[1] I. Sutherland, ”A head-mounted three dimensional display,” Fall Joint Computer Conference,, 1968. .

[2] C. B. S. H. S. M. H. M. S. W. M. E. E. M. E. E. M. and N. N. , ”Contextual In-Situ Visualization for Port Placement in Keyhole Surgery:Evaluation of Three Target Applications by Two Surgeons and Eighteen Medical Trainees,” IEEE International Symposium on Mixed and Augmented Reality, 2009.

[3] P. D. T. R. R. M. S. G. S. and C. S. , ”Augmented reality in medical education: students’ experiences and learning outcomes,” MEDICAL EDUCATION ONLINE, 2021.

[4] C. M. . Z. S. A. R. and l. S. , ”The Effectiveness of Virtual and Augmented Reality in Health Sciences and Medical Anatomy,” Wiley Online Library, 2017.

[5] K. M. K. E. A. L. J. A. C. E. J. L. and G. F. M. d. L. , ”Augmented Reality System for Aiding Mild Alzheimer Patients and Caregivers,” IEEE Conference on Virtual Reality and 3D User Interfaces, 2018.

[6] E. C. P. L. L. and W. H. H. , ”Enhancing Seamless Nurses-Physician Communication After-Hours with Google Glass,” International Confer- ence on Smart Computing and Electronic Enterprise, 2018.

[7] A. C. Miller and T. W. B. , ”Augmented reality: a novel means of mea- surement in dermatology,” Journal of Medical Engineering Technology, 2020.

[8] T. K. E. H. S. H. S. P. M. M. A. S. . M. F. T. W. J. I. H.-P. S. J. H. K. Y.and L. M.-H. , ”Mobile markerless augmented reality and its application in forensic medicine,” Int J CARS, 2014.

[9] J.-J. P. W.-L. W. S. K.-E. G. Kwok-Fong Chan, ”Augmented reality in scientific visualization and communications: a new dawn of looking at antibody interactions,” Antibody Therapeutics, 2020.

[10] S. M. B. I. B. Æ. and a. J. J. , ”What is going on in augmented reality simulation in laparoscopic surgery?,” Surg Endosc, 2009.

[11] N. P. J. K. a. R. M. Athanasios Christopoulos, ”The effects of augmented reality-supported instruction in tertiary-level medical education,” British Journal of Educational Technology, 2021.

[12] R. ,. S.R.Kamel Tabbakh, ”Design and Implementation of a Frame- work based on Augmented Reality for Phobia Treatment Applications,” Second International Congress on Technology, Communication and Knowledge , 2015.

[13] C.-H. Y. Y.-H. H. J.-C. W. C.-C. H. Ta-Ko Huang, ”Augmented reality (AR) and virtual reality (VR) applied in dentistry,” Kaohsiung Journal of Medical Sciences, 2018.

[14] E. S. H. L. Y. L. J. Z.-C. H. Feng Yu1, ”An Augmented Reality Endoscope System for Ureter Position Detection,” Journal of Medical Systems, 2018.

[15] K. A. F. C. C. T. H. D. b. e. Kyle W.Law, ”Use of AccuVein AV400 during RARP: an infrared augmented reality device to help reduce abdominal wall hematoma.,” LAW ET AL, 2018.

[16] D. L. C. E. M. P. B. G. Kevin S. Tang, ”Augmented reality in medical education: a systematic review,” Canadian Medical Education Journal., 2020.

[17] R. T. A. K. and C. S.-L. , ”Augmented reality in neurosurgery,” Arch Med Sci, 2016.

[18] S. B. . S. A. N. . L. S. and C. D. , ”The status of augmented reality in laparoscopic surgery as of 2016,” Medical Image Analysis, 2017.

[19] P. F. G. J. C. P. M. . R. K. . D. P. C. M. J. A. M. M. D. S. L. A. R. F.V. V. . M. H. M. A. S. N. P. C. A. F. C. and M. J. C. , ”Breast cancer surgery with augmented reality,” Medical Image Analysis, 2021.

[20] L. C. M. C. S. C. F. C. E. M. A. T. C. M. V. F. and G. B. , ”The Wearable VOSTARS System for Augmented Reality-Guided Surgery: Preclinical Phantom Evaluation for High-Precision Maxillofacial Tasks,” Journal of Clinical Medicine, 2020.

[21] K. S. K. P. M. T. and D. K. , ”Shift From a Traditional to a Distance Learning Environment during the COVID 19 Pandemic,” Springer, 2021.

[22] M. A. W. . J. M. A. I. H. and . R. L. , ”Augmented reality in surgical training: a systematic review,” Williams MA, et al. Postgrad Med J, 2020.

[23] A. C. Miller and T. W. B. , ”Augmented reality: a novel means of measurement inY. L. and C. H. L. , ”Augmented reality for personalized nanomedicines,” Biotechnology Advances, 2017.

[24] AV. A. and J. P. , ”A REVIEW: AUGMENTED REALITY AND ITS WORKING,” IRJET Journal, 2017.

[25] G. R. T. L. D. W. A. M. G. S. D. S. and . Q. P. , ”Simultaneous Local- ization and Mapping for Augmented Reality,” International Symposium on Ubiquitous Virtual Reality, 2010.

[26] M. A. M. A. E. H. A. A. and A. K. , ”Augmented Reality Mainte- nance Training with Intel Depth Camera,” International Conference on Machine Vision and Information Technology, 2017.

[27] S. H. L. J. C. and . J.-I. P. , ”Interactive E-Learning System Using Pattern Recognition and Augmented Reality,” IEEE Transactions on Consumer Electronics,, 2009.

[28] I. P. and T. O. , ”Utilizing Apple’s ARKit 2.0 for Augmented Reality Application Development,” MIPRO, 2019.

[29] C. W. Y. Q. Xiaozhi Guo, ”Real-time Augmented Reality with Occlusion Handling Based on RGBD Images,” International Conference on Virtual Reality and Visualization (ICVRV), 2019.

[30] AM. B. . T. P. and . H. B. , ”Gesture Interaction with Augmented-Reality Interfaces,” IEEE Computer Society, 2014.

[31] J.-L. L. R. C. and . M. C. , ”A High-level Event System for Augmented Reality,” IEEE, 2007.

[32] D. K. . C. S. . S. W. and . D. S. , ”Visualization Techniques for Augmented Reality,” Institute for Computer Graphics and Vision, 2011.

[33] M. M. and A. L. , ”Augmented Reality: Applications, Challenges and Future Trends,” Applied Computational Science , 2014.

[34] C. A. and N. T. , ”The Evolution and Future Scope of Augmented Reality,” International Journal of Computer Science Issues, 2014.

Articles:

[35] T. I. Partner, ”Augmented Reality and Virtual Reality Market Size Worth 252.16Bn dollars, Globally, by 2028 at 36.9percent CAGR - Exclusive Report by The Insight Partners,” PR newswire, 21 03 2022. [Online]. Available: https://www.prnewswire.com/news- releases/augmented-reality-and-virtual-reality-market-size-worth-252- 16bn-globally-by-2028-at-36-9-cagr—exclusive-report-by-the-insight-partners-301505652.html: :text=In

[36] M. D. Forecast, ”Global AR VR in Healthcare Market Size, Share, Trends, COVID-19 Impact Growth Analysis Report,” 01 2022. [On- line]. Available: https://www.marketdataforecast.com/market-reports/ar-vr-in-healthcare-market.

IMPACT OF ONLINE EDUCATION ON SECONDARY STUDENTS DURINGCOVID-19 PANDEMIC

Ms. Ravita Rajendra Patil and Prof. Mrs. Shravani Pawar
Department of Master of Computer Application, Bharati Vidyapeeth's Institute of Management andInformation Technology (BVIMIT), University of Mumbai, C.B.D Belapur Navi Mumbai, India

15. ABSTRACT

The COVID-19 pandemic has created the biggest disruption of education systems in human history. The main challenges that the scholars encountered are: (a) struggle with on-line education, (b) problem connecting with instructors, (c) lack of motivation, (d) losses, (e) problem accessing alternative learning resources, and (f) unsafe/inaccessible home setting. Recommendations area unit provided for instructors and directors to support students in these difficult times. Within a brief span of the COVID-19 pandemic, several researchers have shared their works on teaching and learning in several ways in which. Many faculties, faculties and universities have discontinued face-to-face teachings. There is a worry of losing 2020 school year or perhaps a lot of within the coming backfuture. The necessity of the hour is to introduce and implement various instructional system and assessment methods. The COVID-19 pandemic has provided North American country with a chance to pave the means for introducing digital learning. This article aims to supply a comprehensive report on the impact of the COVID-19 pandemic on The Impact of on-line Education on secondary students

Keywords: online Education, education on secondary students, COVID-19, Offline Lectures, Digital learning

1. INTRODUCTION

Online courses provide flexibility, as they will not need learners to be at a selected location for sophistication participation. Students may match with course materials at their ownconvenience, or they will work collaboratively with different students during an internet setting. Today, distance education serves not solely adult learners, however conjointly education students. The Covid-19 pandemic affects all the sectors of bread and butter. Thanks to the internment, students were not able to attend a standard schoolroom that falls a negative impact on their studies. That the instructional government of Republic of India set to start out on-line categories for the scholars in order that their studies may be continued. Online education provides high school students the flexibility to review on a versatile schedule, ciao as a course is completed inside its selected timeline, giving them longer to have interaction in extracurricular activities, like sports, arts, music, volunteer work, or part-time jobs

No one unreal that Covid-19 would flip our world the wrong way up and would bring major changes to our manner. The virus has unfold all over sort of a wild fire thanks to that various changes were accepted by individuals everywhere the planet, and it took a while for everybody to adapt to the new traditional. Online categories and technology have emerged as a superhero throughout the internet days. We have all been underneath confinement however, square measure still connected with the planet of education. Thanks to the internet, students have not been able to keep connected with the outer world and the lack of exposure is obvious. The sole reprieve for the students' mental well-being has been the transition to on-line categories. Lecturers created positive that the educational for college kids was not compromised, so that they took a good step forward to search out solutions and build new learning environments for his or her students to make sure that learning ne'er stops. With very little time to arrange, curriculums were changed, new lesson plans were created, activities were planned, all in order that their students stay actively concerned through on-line learning.

2. OBJECTIVE/SCOPE

The objectives of this research paper are as follows:

Online education enables the teachers and student to set their own learning pace but there is a lack of willingness and desired to learn. Students are simply not motivated in online classes/ Lectures. They are usually easy as and are time efficient, but student learning outcomes tend to be lackluster. During COVID pandemic offline survey of secondary school students lectures are conducted online. Here we collect student's data and information on online learning and a cross-sectional web- based survey was data collection through a questionnaires. We evaluated the association of various factors and effects of online lectures on students.

3. LITERATURE REVIEW

Review of connected Literature very little research-based literature is accessible on the present standing of on-line learning in high faculties. The data concerning what high faculties do to produce on-line learning to their students is maybe not shocking considering the relative novelty of the development. However, Websites exist that provide elaborated samples of the ways that within which high faculty area unit is creating on-line learning doable. many that have administered the start phases of on-line learning programs have written articles giving steering to others, but, in general, not a good deal of knowledge exists relating to the standing of on-line learning in pedagogy. Although very little analysis has taken place associated with the standing of on-line learning in high faculties, there has been a good deal of activity that deserves attention. Simply a careless look at the fourth estate from Wisconsin, for example, reveals each curiosity concerning on-line learning and anxiety concerning the policy problems it presents.

Although very little analysis has taken place associated with the standing of on-line learning in high faculties, there has been a good deal of activity that deserves attention. simply a careless look at the fourth estate for example, reveals each curiosity concerning on-line learning and anxiety concerning the policy problems it presents.

[1] This paper aims to investigate student essays within the kind of views or responses concerning the challenges of on-line learning throughout the COVID-19 pandemic. This paper collected fifteen students as samples within the Fundamentals of Education I course World Health Organization were actively concerned in on-line learning activities. This study used a qualitative approach. The man of science then collection, reading and highlights every student's response that's thought of relevant for analysis.

[2]The purpose of this study was to conduct on-line web an internet} survey relating to teacher's and student's perception and skill associated with online categories. this survey describes faculty and university lecturers and students' perceptions and issues with relevance taking on-line categories that are created obligatory within the wake of COVID19. Online survey methodology was used for the aim of information assortment. The findings show that the subsequent areas are vital for teacher and student satisfaction with on-line categories, these areas are quality and timely interaction between student and academic, technical support accessibility, structured on-line category modules, and modifications to accommodate physical phenomenon of sensible categories

[3]This study used survey strategies and knowledge assortment within the kind of instruments with a Likert scale with a sample of 56 students. The results of this study indicate that lecturers in managing on-line learning don't seem to be in line with student expectations. Students feel that on-line learning has not provided higher expertise and productivity in mastering competencies, however will offer motivation and ease in their learning. Some students declared that that they had the benefit of access to resources, however students were still reluctant to use it sustainably within the future.

[4]This study used survey ways and information assortment within the sort of instruments with a Likert scale with a sample of fifty six students. The results of this study indicate that lecturers in managing on-line learning don't seem to be in line with student expectations. Students feel that on-line learning has not provided higher expertise and productivity in mastering competencies, however will offer motivation and ease in their learning. Some students explicit that they'd the convenience of access to resources, however students were still reluctant to use it sustainably within the future.

[5]The aim of the study is to spot the factors poignant students' satisfaction and performance relating to on-line categories throughout the pandemic amount of COVID–19 and to determine the connection between these variables. The study is quantitative in nature, and also the knowledge were collected from 544 respondents through on-line survey.

[6] This online survey was designed with questions based on ease of accessibility, attentiveness, learning outcome, stress level, preferred learning mode, and was shared through Gmail and WhatsApp. Almost all the respondents could access virtual platforms; 48.3% found themselves inattentive during the online classes, while 71.6% were not satisfied with respect to understanding the topic.

[7]In this paper, they investigate the impact of the abrupt switch to on-line teaching that occurred in 2020 thanks to the COVID- 19 pandemic. By mistreatment responses from 362 professors and students from thirteen European countries, they realize that universities and students were terribly fast to adapt to the new changes, which a mixture of synchronous and asynchronous interaction and assessment ways area unit presently used.

[8]This paper highlights some measures taken by Govt. of India to provide seamless education in the country. Both the positive and negative impacts of COVID-19 on education are discussed and some fruitful suggestions are pointed to carry out educational activities during the pandemic situation.

[9]This study aims to explore whether or not on-line learning has a control on communication between instructors and students in an exceedingly negative method, whether or not on-line learning affects students' productivity levels and to gauge and counsel ways that of rising effective on-line communication between instructors and students.

[10]This article emphasizes on however on-line learning is helpful throughout times of crises like work absences or pandemics. Therefore, some tools and techniques for on-line learning which might make sure the continuity of learning area unit highlighted. Some rising approaches of presidency of Bharat for on-line learning area unit bestowed deserves and demerits of on-line learning platform also are mentioned. Perceptions of learners and educators on on-line Learning system throughout internment area unit pointed.

4. PROBLEM DEFINITION

During COVID-19, pandemic on-line lectures have affected an oversized variety of scholars. Before the matter statement is crafted, the matter should be outlined. It is attribute to require to start performing on an answer as shortly as potential and neglecting the definition of verity drawback to be resolved. However, a poorly outlined drawback will increase the danger of implementing an answer that does not totally meet the expected results. A reveals can't be resolved if it's not fully understood

5. METHODOLOGY

For this study, the author shaped one short survey: for college kids. The survey queries assessed the final perception students regarding on-line and offline categories. The survey had a cross- sectional of ten demographic questions about taking on-line categories. The literature suggests that one amongst the largest benefits of Web-based courses is:

- That they supply anytime and anywhere learning. It had been argued during this paper that the Pedagogy of on-line courses ought to be driven by active learning ways. Implementing these ways may not work into the "anytime" and "anywhere" options of the Web-based courses. As an example, period of time collaboration of learners needs their composition a time and meeting within the on-line (or offline) house. Therefore, it is vital to think about alternative discourse factors of the net course beside the methodology of the course.

6. ANALYSIS AND FINDINGS

Our study compared learning via F2F vs. on-line learning modalities in teaching associate degree biological science course to boot evaluating factors of gender and sophistication rank. This information demonstrate the power to equally translate biological science ideas for non-STEM majors in each ancient and on-line platforms regardless of gender or category rank. The social implications of this finding are necessary for advancing access to and learning of scientific ideas by the overall population, as several establishments of upper education permit a web course to be taken while not enrolling during a programmer. Thus, the potential exists for increasing the quantity of non-STEM majors engaged in national science victimization the flexibleness of on-line learning to show biological science core ideas. COVID-19 pandemic resulted in the rise of E-learning.

This situation led to whether e learning is a good alternative to classroom learning. Here we ask questions for students and collect information about what they think and what is effect on students. A total of 76 lecturers and 412 students participated within the survey. For the teacher's survey seventy lecturers completed the whole survey i.e. 92.1% of the entire sample, whereas for the scholars 407 of them completed the whole survey i.e. 98.7% of the entire sample. Thence the information of solely 70 lecturers and 407 students were thought-about for the analysis. No incentives were offered for responding to the survey. The small print concerning the survey was shared with the respondents. Completion of the survey was taken as a style of consent to participate.

Online vs Offline Class

Questions	Students opinion	Agree	Disagree
Online classes/ lectures are more effective than classroom mode	Offline class/ lectures are more effective	60%	40%
Method of Teaching is good in online	Traditional tools and methods of teaching in offline and Digitalised tools and methods of teaching in online so doubt are not clear properly	40%	60%
Online classes are fun and interactive than offline class lectures	Offline classes are more interactive and fun	20%	80%
Is online Cost-effective and Time saving	More expensive than online education and consumes more time and online classes are Cost-effective and time-saving	70%	30%
Flexibility	Online classes have a flexible schedule	75%	25%
Student and teachers interaction in online	There is a sample amount of interaction between students and teachers over the online platform and There is face-to-face interaction in the case of offline classes, especially because teaching is synchronous. There is active	35%	65%

	communication between students and academics that permits for spirited discussionsand debates between them		
Level of Commitment	Students are less likely to remain serious andcommitted to their studies in online	70%	30%
It is difficult to engage students in onlineclasses	There is a lack of supervision on each student	50%	50%
There is lack of teacher student interactionin online classes	It is not possible to focus on every studentonline because virtual presence	76%	24%
Difficult to keep classes for longer durationduring online classes	Longer classes may effect on student healthexample-eye problem etc.	70%	30%
It is difficult to control group interactionduring online classes	Lack of physical presence to observe individually, hence difficult to control.	60%	40%
student interaction	Lack of discipline on virtual mode, so lessinteraction.	40%	60%

Student's Perception of Online Classes

Questions	Students opinion	Agree	Disagree	Solution
Technical issues effect theflow of online classes	No proper internet so problemin connectivity	70%	30%	Take a seem which has a proper network in your area
Lack of gadgets	Every parent can't afford smartphone so lack of gadget	40%	60%	Government should provide a subsidy to for the low-income people/share a gadget
Addicted to mobile	Student use mobile for maximum time so addicted to mobile	75%	25%	Mobile should have access only to the classes
Lack of study environment	Everyone do not proper studyenvironment at their home.	80%	20%	Group of 8-10 student can identify a one place where they can study.
Lack of teacher attention	Teacher is not able to reach every student individually so lack of attention	40%	60%	Less student in a one batch
Lack of discipline	Student also do not follow thediscipline	75%	25%	Video call should be monitored properly
flexible	It is flexible to all and can beattend from anywhere	60%	40%	It is flexible
Less fees	As it is virtual so no seat limitshence can provide with the affordable fees.	70%	30%	So no one will lose the academic due to high fees.

Students Perception of Offline Classes

Questions	Students opinion	Agree	Disagree	Solution
Travelling time	In today's world due to heavy traffic it takes longer time to reach classes	60%	40%	Traffic Management Measures: Effective Use of Bus Service and
Lack of transport	Lack of transport in rural area	80%	20%	Government should ensure transport in all areas frequently
Practicebased teaching	Teacher takes a practice basedstudy so that every student should know the each concept	88%	12%	It is a good for students'academic growth
Interaction withstudent	It is more easy to connect withthe teacher and students formore help	80%	20%	It helps to clear a doubt
Increase studen tcompetition	Student get a competitive environment so that they can reach to their maximum level.	90%	10%	Student get motivated for the study
Classroom interaction	More convenient to interact with each other	90%	10%	Interaction makes student teacher relation healthy
Extra activities	Some student are good in sportthan academic so they can make their carrier in sport or other games	65%	35%	Student may find their carrier in extra curriculum activities.

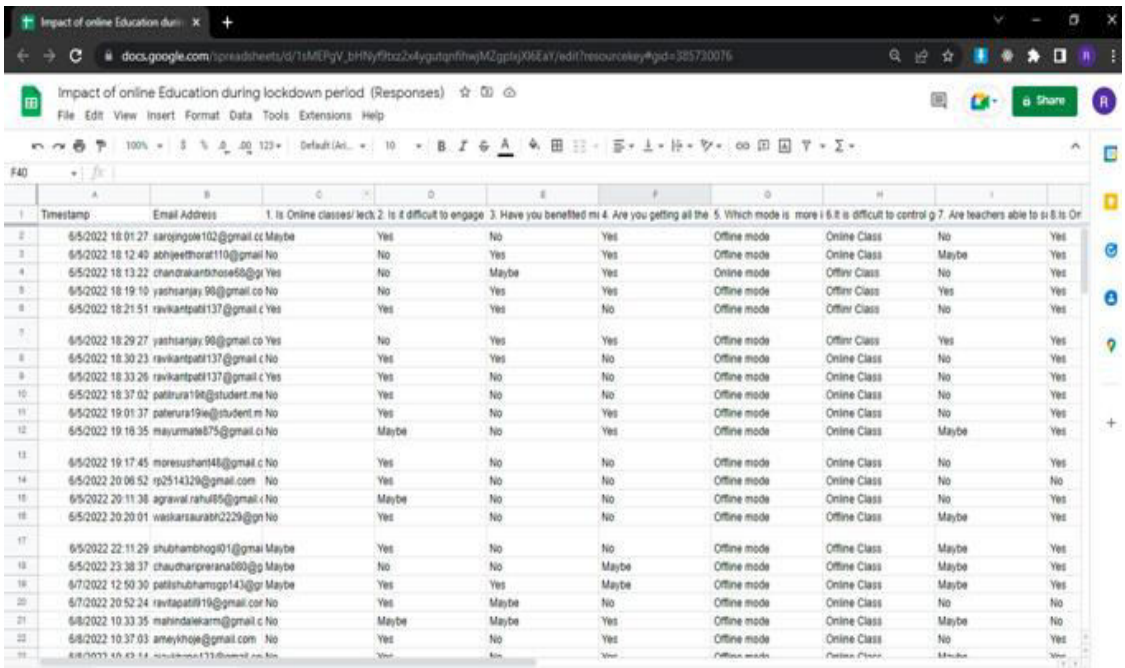


Fig 1: Data of student's response

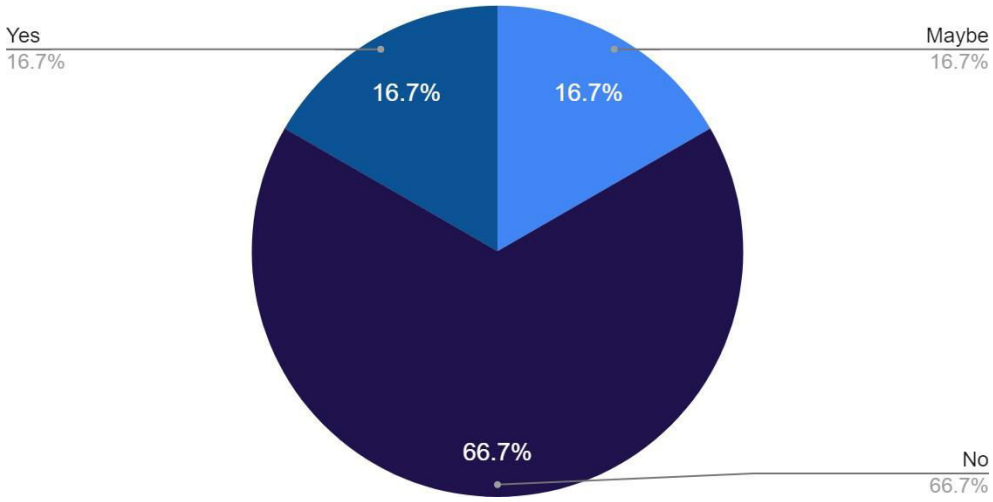


Fig 2: Offline Classes more effective than Online Classes

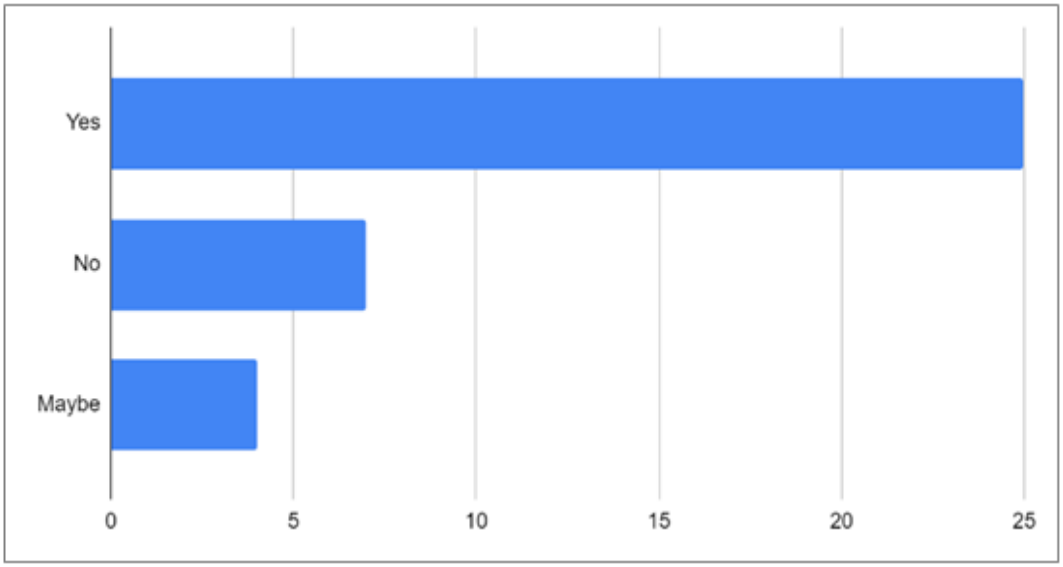


Fig 3: Count of difficult to engage students in online classes

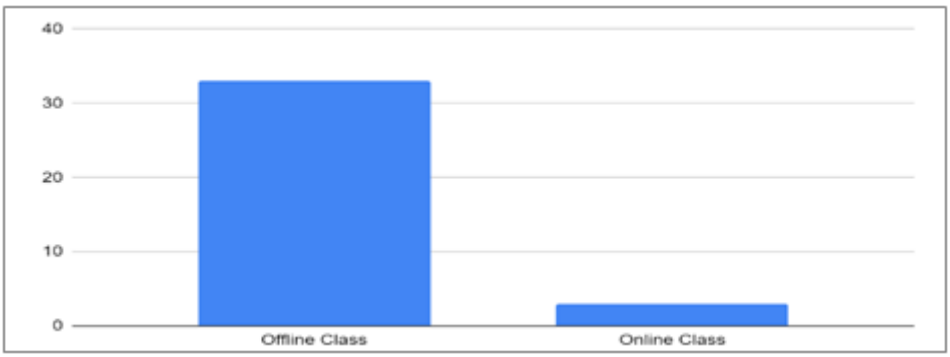


Fig 4: Count of students those are preferred most

7. CHALLENGES OF ONLINE LECTURES

- In the classroom, students will not only learn the subject butalso interacts with other students and thereby make friends. Classroom influences the overall personality development of students. With e learning, students will be deprived of this opportunity.

- As students have to look at screens continuously, it can strain their eyes.
- With e learning, teachers may not be able to focus on all the students, which will be possible in the classroom. Teachers might not additionally perceive whether students may grasp the conception or not.
- The classroom environment is lively in nature, whereas sitting in front of a computer or smartphone to listen to the classes will be boring.
- Some people do not have internet facility. Therefore, online learning deepens the inequality between rich and poor.
- Online learning may not create as much seriousness as classroom learning. Therefore, students may not be motivated enough to listen to the class.
- Not all parents are technologically educated to help their children in case of any issues.
- If the device has other apps such as YouTube, students may become distracted. Several students are already suffering from smartphone addiction. So, parents may not feel safe to leave the children unsupervised

8. FUTURE SCOPE

- The offline mode of study permits direct interaction between the academics and students
- Offline studies give a healthy competitive atmosphere to the scholars.
- If facilitates smart schoolroom communication that helps in understanding the ideas simply.
- academics pays equal attention to each student within the category.
- Extracurricular activities in offline mode facilitate within the overall development of scholars
- students there like offline education owing to higher schoolroom interaction and understanding. it's inevitable for anyone to be sitting before of the screen for a full lecture and not get distracted.
- Offline education means that teacher gets to understand their student higher, not simply that however once a lecturer is aware of concerning their student's thinking then that helps in designing the teachings.

9. CONCLUSION

Generally, offline courses area unit a lot of accepted approach to education. Since it's Been in use for hundreds of years and offers higher results. however there area unit each professionals and con to both the ways of education. several establishments have utilized on-line and offline Methods. Offline courses are a region of our education system for as long as we are able to keep in mind years and years later, we have a tendency to still use one to at least one interaction between academics and Students. One goes to a correct college or faculty to institute to receive associate degree education. The emergence of on-line education cannot degrade the importance of offline education

10. REFERENCES

[1] Nambiar, Deepika. "The impact of online learning during COVID-19: students' and teachers' perspective." The International Journal of Indian Psychology 8.2 (2020): 783-793.

[2] Pokhrel, Sumitra, and Roshan Chhetri. "A literature review on impact of COVID-19 pandemic on teaching and learning." Higher Education for the Future 8.1 (2021): 133-141.

[3] Syauqi, Khusni, Sudji Munadi, and Mochamad Bruri Triyono. "Students' Perceptions toward

Vocational Education on Online Learning during the COVID-19 Pandemic." International Journal of Evaluation and Researchin Education 9.4 (2020): 881-886.

[4] Chakraborty, Pinaki, et al. "Opinion of students on online education during the COVID-19 pandemic." Human Behavior and Emerging Technologies 3.3 (2021): 357-365.

[5] Gopal, Ram, Varsha Singh, and Arun Aggarwal. "Impact of online classes on the satisfaction and performance of students during the pandemic period of COVID 19." Education and Information Technologies 26.6 (2021): 6923-6947.

[6] Gupta, Renu, et al. "Covid-19 pandemic and online education: Impact on students, parents and teachers." Journal of HumanBehavior in the Social Environment 32.4 (2022): 426-449.

[7] Tartavulea, Cristina Venera, et al. "Online Teaching Practices and the Effectiveness of the Educational Process in the Wakeof the COVID-19 Pandemic." Amfiteatru Economic 22.55 (2020): 920-936.

[8] Jena, Pravat Kumar. "Impact of pandemic COVID-19 on education in India." International journal of current research (IJCR) 12 (2020).

[9] Alawamleh, Mohammad, Lana Mohannad Al-Twait, and Gharam Raafat Al-Saht. "The effect of online learning on communication between instructors and students during Covid-19 pandemic." Asian Education and Development Studies (2020).

[10] Jena, Pravat Kumar. "Online learning during lockdown period for covid-19 in India." International Journal of Multidisciplinary Educational Research (IJMER) 9 (2020).

STOCK PRICE PREDICTION USING EMA TECHNIQUE

Sahil Thombare[1] and Shravani Pawar[2]
[1]MCA Department and [2]Assistant Professor MCA Department, BVIMIT, Navi Mumbai

ABSTRACT
India's stock market is extremely volatile and un- predictable, which has a limitless number of aspects that regulate the directions and trends of the stock market; therefore, predict- ing the uptrend and downtrend is a complicated process. This paper aims to demonstrate the use of EMA(Exponential Moving Average)which helps us to predict the trend of market. Usingthis we can take trade on daily basis.

Keywords: stock, EMA, Candle, Stop Loss

1. INTRODUCTION
Stock market is characterized as dynamic, unpredictable andnon- linear in nature. Stock price predictions are challenging because they depend on many factors including political conditions, global economies, and a company's financial performance. In order to maximize profit and minimize losses, techniques to predict the values of the stock in advance by analyzing the trend over the last few years could prove highly useful for making stock market movements. There have traditionally been two main approaches to predicting the stock price of an organization. To predict future stock prices, technical analysis methods use historical price information such as closing and opening price, volume traded, and adjacent close values. Secondly, there is the qualitative analysis, which is based on external factors such as company profile, market situation, political and economic factors, and textual sources such as financial newspaper articles, social media and even blogs written by economicanalysts. In today's market, advanced intelligent techniques based on technical analysis or fundamental analysis are used for stock price prediction. The data size for stock market analysis is especially large and non-linear.

To deal with this variety of data efficient model is neededthat can identify the hidden patterns and complex relations in this large data set. Machine learning techniques in this area have proved to improve efficiencies by percent as compared to the past methods [1]. Machine learning can be defined as the data which is obtained by knowledge extraction. Machines dont have to be programmed explicitly instead they are trained to make decisions that are driven by data. Instead of writing a codefor every specific problem, data is provided to the generic algorithms and logic is developed on the basis of that data. When a machine improves its performance based on its past experiences it can be said that machine has truly learnt. The technique for most accurate prediction is by learning from past instances, and to make a program to do this is best possible with machine learning techniques. Any machine learning technique (supervised or unsupervised) is efficient enough to generate rules for programs, in consideration with present ones to take a better decision. In this scenario, the decision is whether the stock will increase or decrease (Stock analysis). [1]

Over the past 25 years, NSE's identity crafted in the nineties has stood for reliability, expertise, innovation, and trust. India's economy and technology landscape have undergone dramatic changes in the last 25 years. In its new identity, the NSE reflects its multidimensional nature: numerous asset classes, many customer segments, and its various roles as an exchange, regulator, index provider, data and analytics provider, IT service provider, facilitator,and teacher. An image of a blooming flower represents growth inthe new identity. A multitude of colors represents the company's diversity. The red triangle symbolizes NSE's strong foundation, while the yellow and orange triangles are inspired by the flower of prosperity and

auspicious ventures, the marigold, and the blue triangle symbolizes our compass, always looking forward.

The sharp edges indicate technology, precision and efficiency. The shape also amplifies NSE's tradition of collaboration. The internal vectors depict NSE's DNA of continuously pushing boundaries. [2]

1.1 CONCEPT

- Using EMA on 5 min, 15 min,1day and 1 Month time frame we can predict the direction of market.
- Set the length of EMA to 5 which calculates the average of last 5 candles.
- For example:- Whenever 5 min candle low not touching 5 EMA on next candle if it breaks previous candle low then we have to take the trade.
- We have to add EMA three times consecutively and set the length of each EMA as (5,8,13)respectively.
- Whenever the crossover of 3 consecutively EMA happensthe trend of the market is determined.
- Whenever the crossover of 3 consecutively EMA happensthe trend of the market is determined.
- When 1 Month candle is not touching 5 EMA on next candle if it breaks high of previous candle we have to invest money for long term and stoploss well be low ofalert candel.

2. LITERATURE REVIEW

NSE was incorporated in 1992. It was once known as a inventory alternate by way of SEBI in April 1993 and commenced operations in 1994 with the launch of the wholesale debt market, accompanied rapidly after by way of the launch of the money market segment.

National Stock Exchange of India Limited (NSE) is the main inventory change of India, positioned in Mumbai, Maharashtra. It is world's biggest derivatives trade in 2021 by using variety of contracts traded based totally on the information maintained via Futures Industry Association (FIA), a derivatives change body. NSE is ranked 4th in the world in cash equities by number of trades as per the statistics maintained by the World Federation of Exchanges (WFE) for the calendar year 2021 . It is beneath the possession of some main monetary institutions, banks, and insurance plan companies.[5] NSE was once installed in 1992 as the first dematerialized digital alternate in the country. NSE used tobe the first alternate in the usa to supply a modern, wholly computerized screen-based digital buying and selling device that provided handy buying and selling services to buyersunfold throughout the size and breadth of the country. [3]

1) Mehar Vijh, Deeksha Chandola and Arun Kumar (2022) present some important concept of stock price prediction using machine learning technique.

Accurate prediction of stock market returns is a verychallenging task due to volatile and non-linear nature of the financial stock markets. With the introduction of artificial intelligence and increased computational capabilities,programmed methods of pre- diction have proved to be more efficient in predicting stock prices. In this work, ArtificialNeural Network and Random Forest techniques have been utilized for predicting the next day closing price for five companies belonging to different sectors of opera- tion. The financial data: Open, High, Low and Close prices of stock are used for creating new variables which are used as inputsto the model. [3] The historical dataset available on company's website consistsof only few features like high, low, open, close, adjacent close value of stock prices, volume of shares traded etc., which are not

sufficient enough. To obtain higher accuracyin the predicted price value new variables have been created using the existing variables. ANN is used for predicting the next day closing price of the stock and for a comparative analysis, RF is also implemented

2) Jingyi Shen M. Omair Shafiq(2020) present some important concept of short term stock market price trend prediction using a comprehensive deep learning.

In the generation of massive data, deep studying for predicting inventory market fees and developments has grow to be even extra famous than before. We accrued two years of statistics from Chinese inventory market and proposed a complete customization of characteristic engineering and deep learning- based mannequin for predicting charge fashion of inventory markets.The proposed solution is comprehensive as it includes pre-processing of the stock market dataset, utilization of multiple feature engineering techniques, combined with a customized deep learning based system for stock market price trend prediction. [4]

3) K.Shrinivas A.Krishna Mohan(2021) present some important survey on stock market prediction using machine learning technique.

This paper provides a review and comparative analysis of different stock market prediction parameter techniques. These techniques are used to evaluate stock market performance and trends. The stock market forecasting system is to increase accuracy. In this study to analyze a novel approach to improve the prediction of the results of stock, it means we will combine two or more methods to construct a novel approach method. [5]

4) Sparsh Sharma and Saurabh Singh(2021) present some important survey on stock market prediction using machine learning technique.

This article reviewed research based totally on a widely wide-spread framework of SMP. It typically targeted on the research from remaining decade (2011–2021). The research had been analyzed and in contrast primarily based on thekind of information used as the input, the information pre-processing approaches, and the computing device getting to know methods used for the predictions. Moreover, an considerable comparative evaluation was once performed, and it used to be concluded that SVM is the most famous method used for SMP. However, techniques like ANN and DNN are mostly used, as they provide more accurate andfaster predictions. [6]

5) Somenath Mukherjee and Nairita Sarkar(2021) present some important survey on stock market prediction using deep learning algorithm.

This study proposes two approaches to predict stock market indices and stock prices. This study first uses a Feed-forward Neural network and performs the backpropagation algorithm for the training process. This model gave a fundamental insights into the prediction trend and provided a graphical results on how the prediction should looks. This model gave satisfactory result with an average prediction accuracy of 97.66 Percent, but it requires many training data and epochsto get to the above accuracy. [7]

6) Ajinkya Rajkar, Aniket Raut Nilima Kulkarni(2021) present some important survey on stock price prediction and analysis.

Our model gives a real number as an output which is the predicted closing price for T+1 day. This model can only be compared with the actual closing price to see how accurately it measures the performance of selected stock. [8]

7) Dipak Raut, Ashok Shinde, Anjali Jagtap and Smita Kadam (2017) present some important survey on stock market forecasting using machine learning.

In this lookup which utilized the time sequence evaluation techniques, time sequence evaluation strategies have outperformed the different strategies in the experiment. Data transformation system opens up every other probability to be located by means of the focused algorithms

The use of a different data type by transforming real numbers into categorical ordinal data can improve the outcomes of the techniques. The outcomes are favourable when less structured data are transformed into more structured data in ordinal form. Since there are many other data types, further it canbe conducted to compare the effects of transforming various forms of data types in time series analysis techniques usedfor prediction of stock price trend. [9]

3. TECHNICAL ANALYSIS

1. Technical analysis is the study of stock prices to make a profit, or to make better investment decisions by using charts.
2. Technical analysis predicts the direction of the future price movements of stocks based on their historical data, and helps to analyze risk to reward ratio.
3. Technical analysis uses price charts and certain formulae, and studies patterns to predict future stock prices; it is mainly used by short-term investors. The rate would be viewed high, low or open, or the closing charge of the stock, the place the time factors would be daily, weekly, monthly, or yearly.
4. Technical analysis is most important for intraday traders to make a trade profitable for that purpose they uses some calculations, indicators, chart patterns etc.
5. There are several technical indicators, such as the Moving Average (MA), Moving Average Convergence/Divergence (MACD).

A. EMA (Exponential Moving Average

An exponential moving average (EMA) is a type of moving average (MA) that places a greater weight and significance on the most recent data points. The exponential moving average is also referred to as the exponentially weighted moving average. An exponentially weighted moving average reacts more significantly to recent price changes than a simple moving average (SMA), which applies an equal weight to all observations in the period. [10]

Formula: EMA = Closing price x multiplier + EMA (previous day) x (1-multiplier)

4. METHODOLOGY

To make a trade profitable we are using Exponential moving average(EMA) technique. Now a days most of the traders prefer intraday trading rather than investing. There are many trading techniques in the market use to make atrade profitable .

EMA is one of them technique used for trading whichisexplored below.

- We are using EMA to identify the trend of the market on specific time frames.
- To identify the trend of market we have to add EMAs three times on chart. Then set the length of each EMAs as 5,8,13 respectively. Also change the color of each EMAs so that we know the length of each EMAs.
- Whenever crossover happens of 3 EMAs there is trend change in the market.
- E.g., Whenever the length of EMA(13) is greater than length of EMA(5 and 8) then it is consider as negative trend. And whenever the length of EMA(5)is greater than length of EMA(8 and 13) then it is considered asPositive trend.

There is another one technique called 5 EMA which isexploredbelow.

- This technique is used only for selling(To short the market).

- Using this technique we are going to take an trade inlive market.
- Firstly find an 5 min (negative) red candel which is not touching 5 EMA(Exponential moving average).
- Whenever 5 min negative candel not touching 5 EMA on next next candel if it breaks previous candels lowthen we have to take the trade.
- SL (stop loss) will be high of alert candel.
- Reason behind using 5 EMA is, EMA calculates the average of previous candels.
- Candels and EMA both have to travel simultaniously by touching each other.If candel does not touch to 5 EMA then we can make short position.

5. FINDINGS

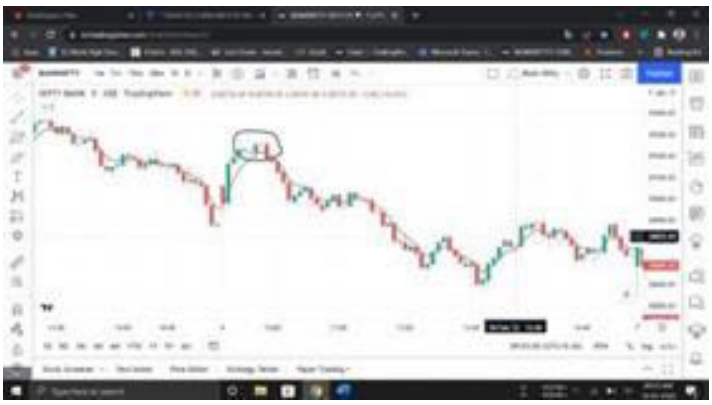
1) In below chart corssover of EMA happens on 15 minutstimeframe and it is showing there is Bullishness in market.

Whenever the length of EMA 5 is greater then the length of EMA 8 and 13 then it should be consider as market is in Up trend.This technique is used for short term trading.

2) In below chart corssover of EMA happens on 15 minuts time frame and it is showing there is Berishness in market.

Whenever the length of EMA 13 is greater then the length of EMA 8 and 5 then it should be consider as market is in Down trend.

3) In bellow chart 15 min candel is not touching 5 EMAand next candel breaking the low of previous candel. As mention above this is the perfect setup of 5 EMA.



6. CONCLUSION

Using this EMA technique we can predict the trend ofmarket. Thesuccess ratio of EMA is 78 percent which is calculated after back testing the technique for more than 6 months. As compare to others technique and research paper this research paper helps us to predict the intraday trend of market. Using this technique we can take trade on daily basis. Other research paper which are mentioned above helps to predict the long term trend of market while this research paper helps us to determine the intraday trend. As Results show that the best values obtained by EMA indicator which indicates the trend change. To identify the trend of market we have to add EMAs three times on chart.Then set the length of each EMAs as 5,8,13 respectively. Also change the color of each EMAs so that we know the length of each EMAs. TO obtain the higher accuracy given rules must be followed. The studies were analyzed and compared based on the type of data used as the input, the data pre-processing approaches, and the EMA techniques used for the predictions.

7. REFERENCES

[1] M. V. a. A. Kumar, ”Stock Price prediction Using Machine Learning Technique,” International Conference On Computational Intelligence and Data Science(ICCIDSn2019), 2019.

[2] ”https://www.nseindia.com/national-stock-exchange/purpose-vision- values”.

[3] ”https://en.wikipedia.org/wiki/National Stock Exchange of India”.

[4] J. S. a. M. O. Shafq*, ”Short-term stock market price trend prediction using a comprehensive deep learning system,” Journalof Big Data, 2020.

[5] K. S. . A. K. Mohan, ”A Survey on Stock Market Prediction Using Machine Learning Techniques,” 2020.

[6] S. S. a. S. Singh, ”Stock Market Prediction Using MachineLearning Techniques,” 2021.

[7] S. M. a. N. Sarkar, ”Stock market Prediction Using Deep LearningAlgorithms,” 2021.

[8] A. R. . N. K. Ajinkya Rajkar, ”Stock Market Price Prediction and Analysis,” International Journal of Engineering Research Technology (IJERT), 2021.

[9] A. S. A. J. a. S. K. Dipak Raut, ”STOCK-MARKET FORECASTING USING MACHINE LEARNING,”INTERNATIONAL JOURNAL OF CURRENT RESEARCH, 2017.

[10] ”https://www.investopedia.com/terms/e/ema.asp: :text=Finally

IMPACT OF MODERN TECHNOLOGY IN EDUCATION

Dr. Abhijit Banubakode[1] and Mr. Deepak Bhusari[2]
[1]Department of Computer Science & Engineering, MET Institute of ComputerScience, Mumbai, Maharashtra
[2]MCA Student, MET Institute of Computer Science, Mumbai

ABSTRACT
Technology is a gift of God. After the gift of life, it is perhaps the greatest of God's gifts. It is the mother of civilizations, of arts and of sciences. Technology has certainly changed the way we live. It has impacted different facets of life and redefined living. Undoubtedly, technology plays an important role in every sphere of life. Several manual tasks can be automated, thanks to technology. Also, many complex and critical processes can be carried out with ease and greater efficiency with the help of modern technology. Thanks to the application of technology, living has changed and it has changed for better. Technology has revolutionized the field of education. The importance of technology in schools cannot be ignored. In fact, with the onset of computers in education, it has become easier for teachers to impart knowledge and for students to acquire it. The use of technology has made the process of teaching and learning all the more enjoyable.

1. INTRODUCTION
The era of 21st century is often regarded as an era of technology. Technology, today, plays a very important role in our life. It is seen as a basis of growth of an economy. An economy which is poor in technology can never grow in today's scenario. This is because technology makes our work much easier and less time consuming. The impact of technology can be felt in every possible field one such field is Education.

2. MODERN TECHNOLOGY IN EDUCATION
According to the latest insights as to how exactly modern students of today prefer to use technology and how does their learning get an impact if they use technology, it was revealed that the use of modern equipment technology and tools, the learning and interactivity of students increases. They also find it much more interactive, as well as full of interesting areas, when aided by technology. The transfer of knowledge becomes very easy and convenient, as well as effective. What this means is, that our minds now tend to work faster when Assisted with the use of modern technology, be it any part of life, here we talk about education. The reliance and dependence of such an innovation, that simply makes life an easy, smooth journey is completely unavoidable these days even in schools, universities and colleges. Students today can make use of technology in the following ways:

1. Internet Connection and Round the Clock Connectivity
The internet has grown in importance by many folds, over the process of decade. Its importance in the education world can now never be undermined. Despite the chances of fraud and drawbacks, the use of the internet is like a blessing for students. Today, the internet is something that is present in almost everything we use. From television to gaming consoles, and our phones, the internet is literally everywhere. The use of the internet allows students to find amazing convenience, they can find various kinds of help, tutorials and other kinds of assisting material which could be used to academically improve and enhance their learning.

2. Using Projectors and Visuals
Visual images always have a strong appeal compared to words. Using projectors and visuals to aid in learning is another form of great technological use. Top institutions

Around the world, now rely on the use of amazing PowerPoint presentations and projections in order to keep the learning interactive and interesting. Technological use such as projectors

within the schools and colleges can take the interaction and interest levels right up and also improve motivation. Students like to see appealing visuals and something that entices them to think rather than just reading words. The learning part also becomes pretty efficient when it comes to technology.

4.1.1 Digital Footprint in the Education Sector

If we talk about digital and education, then the penetration of digital media within the education sector has now grown. This penetration has resulted in round the clock connectivity with students and different forums that are available for different kinds of assignments or help. As the power of digital increases, there are and there will be more applications that will assist students in development and learning.

4. Online Degrees with the Use of Technology

Online degrees now have become a very common phenomenon. People wish to take up online courses for their learning and certifications. Top institutions offer amazing online programs with the use of various applications and the internet. This is a concept that will continue to rise as it gets more support and awareness. The online degree scenario around the world is more famous among students who work and look for flexible studying programs.

Figure 3-: Online Degree with Certificate

5. Importance of Technology in Education

The role of technology in the field of education is fourfold: it is included as a part of the curriculum, as an instructional delivery system, as a means of aiding instructions and also as a tool to enhance the entire learning process. Thanks to technology; education has gone from passive and reactive to interactive and aggressive. Education is essential in corporate and academic settings. In the former, education or training is used to help workers do things differently than they did before. In the latter; education is Geared towards creating curiosity in the minds of students. In either case, the use of technology can help students understand and retain concepts better.

6. Factors Affecting Technology in Education

I. Jung talks about the enormous challenge teachers are facing in our society due to the rapid expansion of knowledge. The modern technologies are demanding that teachers learn how to use these technologies in their teaching. Hence these new technologies increase the teachers' training needs. Gressard and Lloyd (1985) asserted that teacher's attitudes toward computers are a key factor in the successful implementation of ICT in education. They pointed out that teachers do not always have positive attitudes towards computers and their poor attitudes may lead to a failure of the computer-based projects. Also, the most commonly cited barriers are: Another barrier given by Butler and Sellbom (2002) and Chizmar & Williams (2001) is reliability. Reliability included hardware failures, incompatible software between home and school, poor or slow internet connectivity and out of date software which are available mostly at school while the students/educators are having more up- to-date software at home.

5. IMPACT OF ICT ON EDUCATION

In educational context, ICT has the potential to increase access to education and improve its relevance and quality. Tinio (2002) asserted that ICT has a tremendous impact on education in terms of acquisition and absorption of knowledge to both teachers and students through the promotion of:

5.1 Active Learning:

ICT tools help for the calculation and analysis of information obtained for examination and also students' performance report is all being computerized and made easily available for inquiry. In contrast to memorization-based or rote learning, ICT promotes learner engagement as learners choose what to learn at their own pace and work on real life situations' problems.

5.2 Collaborative and Cooperative Learning:

ICT encourages interaction and cooperation amongstudents, teachers regardless of distance which is between them. It also provides students the chance to work with people from different cultures and working together in groups, hence help students to enhance their communicative skills as well as their global awareness. Researchers have found that typically the use of ICT leads to more cooperation among learners within and beyond school and there exists a more interactive relationship between students and teachers (Grégoire et al., 1996). "Collaboration is a philosophy of interaction and personal lifestyle where individuals are responsible for their actions, including learning and respect the abilities and contributions of their peers." (Panitz, 1996).

5.3 Creative Learning:

ICT promotes the manipulation of existing information and to create one's own knowledge to produce a tangible product or a given instructional purpose.

5.4 Integrative learning:

ICT promotes an integrative approach to teaching and learning, by eliminating the synthetic separation between theory and practice unlike in the traditional classroom where emphasis encloses just a particular aspect.

5.5Evaluative Learning:

Use of ICT for learning is student-centered and provides useful feedback through various interactive features. ICT allow students to discover and learn through new ways of teaching and learning which are sustained by constructivist theories ofLearning rather than students do memorization and rote learning.

6. POSITIVE IMPACT

6.1Enhanced Teaching and Learning:

Technological developments like digital cameras, projectors, mind training software, computers, Power point presentations, 3D visualization tools; all these have become great sources for teachers to help students grasp a concept easily. It has to be understood that visual explanation of concepts makes learning fun and enjoyable for students. They’re able to participate more in the classroom and even teachers get a chance to make their classes more interactive and interesting

6.2Globalization:

When school in different parts of the state, students can ―meet‖ their counterparts through video conferencing without leaving the classroom. Some sites, such as www.glovico.com are used to help students learn foreign languages online by pairing a group of students with a teacher from another country.

6.3No Geographical Limitations:
With the introduction of online degree programs there is hardly any need of being present physically in the classroom. Even several foreign universities have started online degree courses that student can join. Distance learning and online education have become very important part of the education system now a day.

7. NEGATIVE IMPACT

7.1 Declining Writing Skills:
Due to the excessive usage of online chatting and shortcuts, the writing skills of today's young generation have declined quite tremendously. These days, children are relying more and more on digital communication that they have totally forgot about improving their writing skills.

They don't know the spelling of different words, how to use grammar properly or how to do cursive writing.

7.2 Increasing Incidents of Cheating:
Technological developments like graphical calculators, high tech, watches, mini cameras and similar equipment have become great sources to cheat in exams.

It is easier for students to write formulas and notes on graphing calculators, with least chances of being caught.

7.3 Lack of Focus:
SMS or text messaging has become a favorite pastime of many students. Students are seen playing with their cell phone, iPhones day and night or driving and very often even between lectures.

Being ever-connected to the online world has resulted in lack of focus and concentration in academics and to some extent, even in sports and extracurricular activities.

8. ADVANTAGES

- It makes students more excited to learn.
- Help students with busy schedules, freedom to work at home on their own time.
- Train students to learn new technology skills they can use later in the work place.
- Decrease paper and photocopying costs, promoting concept of ―green revolution

9. DISADVANTAGE

- Many experts and experienced people say that, due to such technology in education, students' imagination is affected, their thinking ability is reduced.
- Sometime it's also time-consuming from teacher's point of view.
- It is costly to install such technology.
- There can be health issues too when used over limit.
- Some students can't afford modern computer technologies.

10. CONCLUSION

Technology has a positive impact on education and at the same time may also pose negative effects. Teachers and students should take advantage of this in the good light and eliminate the drawbacks which are pulling back many of students as well as schools from achieving excellence. It is thus time for every country to introduce a more technologically equipped education sector in the future.

11. REFERENCES

[1] Bowman, M., Debray, S. K., and Peterson, L. L. 1993. Reasoning about naming systems. .

[2] Ding, W. and Marchionini, G. 1997 A Study on Video Browsing Strategies. Technical Report. University of Maryland at College Park.

[3] Fröhlich, B. and Plate, J. 2000. The cubic mouse: a new device for three-dimensional input. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems

[4] Tavel, P. 2007 Modeling and Simulation Design. AK Peters Ltd.

[5] Sannella, M. J. 1994 Constraint Satisfaction and Debugging for Interactive User Interfaces. Doctoral Thesis. UMI Order Number: UMI Order No. GAX95-09398., University of Washington.

[6] Forman, G. 2003. An extensive empirical study of feature selection metrics for text classification. J. Mach. Learn. Res. 3 (Mar. 2003), 1289-1305.

[7] Brown, L. D., Hua, H., and Gao, C. 2003. A widget framework for augmented interaction in SCAPE.

[8] Y.T. Yu, M.F. Lau, "A comparison of MC/DC, MUMCUT and several other coverage criteria for logical decisions", Journal of Systems and Software, 2005, in press.

[9] Spector, A. Z. 1989. Achieving application requirements. In Distributed Systems, S. Mullende

PREDICTION OF THYROID DISEASE USING LOGISTIC REGRESSION ALGORITHM

Mrs. Sarika Panwal and Dr. Sheetal Deshmukh
[1]Research Scholar
[2]Assistant Professor, Yashwantrao Mohite Institute of Management, Karad

ABSTRACT

Nowadays, in human being Thyroid is very common disease which is affecting health. In Chennai a national workshop was held dated on 5th June 2014 on the Advanced Management of Thyroid Disorders. The key speakers of this workshop revealed that 42 million people in India are suffered from thyroid disorders. Mostly Hypothyroidism is common in India which was affected one person among ten persons. Mainly thyroid is of two types: Hyperthyroidism and Hypothyroidism. Early diagnosis of Thyroid is very crucial and valuable which can assist human being to oppose against thyroid disease. Data mining can be utilized to invent expert system for the classification of data.

In this paper, different data mining algorithms like Logistic, J48 decision tree, support vector machine, RandomForest are utilized to develop classifier model for the prediction of thyroid disease. The dataset is downloaded from UCI repository site consists of 6 attributes which is utilized with the objective of experiments. Entire experiments are performed with WEKA open source software using Windows 10 environment. For each algorithm , k-fold cross validation is also used. A Logistic model with k=7 gives accuracy of 97.67% which is better compared to other algorithms and it is acceptable for the diagnosis of thyroid disease.

Keywords: Thyroid disease, Logistic, Prediction, Classification, WEKA

I. INTRODUCTION

The Thyroid gland is sited in front of neck and just below "Adams Apple" whose weight is near about 28 gm. Thyroid gland is used to take iodine which is present in many foods and transfer it into various thyroid hormones such as Triiodothyronine*(T3) and* Thyroxine(T4). The important use of Thyroid gland is to secret thyroid hormones which controls too many things in the human body such as metabolize the food, sleep patterns, usage of energy, temperature preferences, sleep patterns , body weight balance and growth development in children and adults etc.

Thyroid is of two types which are Hypothyroid and Hyperthyroid. If your thyroid gland secretes lot of hormones, hen this condition is called Hyperthyroidism. Hyperthyroidism causes sudden weight loss, increases your body's metabolism, sweating, rapid or irregular heartbeat and nervousness or irritability. . If your thyroid gland secretes too low hormones, then this condition is called Hypothyroidism.

The Thyroid gland can produce either too much hormones or too less hormones. If Thyroid gland producing too much hormones, it is called as Hyperthyroidism and cold intolerance, fatigue, constipation, too much weight gain, heavier menstrual periods, cold intolerance, thinning hair etc are the symptoms of Hypothyroidism.

II DATA SET DESCRIPTION

The website (*http://repository. seasr.org/Datasets/UCI/arff*) is used to download the data set which is used for experimental purpose. The data set consists of 215 instances out of which 150 are from Normal, 35 are from Hyperthyroid and 30 are from Hypothyroid. In the dataset, there are total 6 attributes and last one is the class attribute. The data set description is given below,

Sr. No	Name of the Attribute	Value of Attribute
1	T3-resin uptake test	Continuous
2	Total Serum thyroxin	Continuous
3	Total serum triiodothyronine	Continuous
4	basal thyroid-stimulating hormone (TSH)	Continuous
5	absolute difference of TSH value	Continuous
6	Class	Normal, Hyper, Hypo

III METHODOLOGY

1) Decision Tree

Decision Tree comes under Supervised learning technique which can be used for both Regression and classification problems. internal nodes represent the attributes, branches shows the decision rules **and** each leaf node shows the output or class. J48 is a popular decision tree algorithm. The important benefit of the decision tree is easy to interpret and implement with easy mathematics. In healthcare industry, researchers have been utilizing decision trees for the diagnosis of thyroid disease.

The function of J48 algorithm is given below:

Step 1: The root node initiates the tree, say S that consists of whole dataset**.**

Step 2: By using Attribute Selection Measure (ASM) the best attribute from the dataset has been chosen.

Step 3: Break the whole dataset S into subsets that consists of required values for the best attributes.

Step 4: By selecting the best attribute, the root of decision tree is created.

Step 5: By considering the subsets of dataset made in step 3, generate the decision tree node recursively. This process is repeated until you cannot divide the nodes further and this is called leaf node.

2) Logistic Regression Algorithm

Logistic Regression falls under supervised learning. It is a machine learning algorithm. The use of logistic algorithm is to predict dependent variable by taking help of independent variables. Categorical dependent variable is used for the prediction in Logistic Regression Algorithm. . It may be either True or False or Yes or No etc. Logistic regression are of 3 types such as binomial, Multinomial and Ordinal. It can be used to provide probabilities. With the help of from discrete and continuous already available datasets, logistic algorithm classifies new data of different data types.

3) K- Fold Cross Validation

In k-fold cross validation, we retain a special sample of the dataset, which was not contained in the training dataset. Then, we evaluate our model on that sample and all this process comes under cross-validation. In this approach, the total input dataset is divided into k same size subsamples which are named as folds. For testing model, only one fold or subsample is kept and remaining k-1 folds or subsamples are used for training the model. This approach is very easy to know. In this cross validation, this process is repeatedly executed for k folds, with taking care that every k subsample must be used once for testing the data. To get single output, all k results from the subsamples can be averaged. The benefit of this method is that all input datasets are utilized for both training and testing purpose and it is entered in the weka software followed by pre-processing step.

After that, the predictive models are developed by applying various data mining classification techniques on the data set. The training set is utilized to train the system. Then 10 fold cross validation method is used to test the system. Testing is done using specific performance measures and outputs are shown in terms of precision, accuracy, TP-rate, TP-rate, F-measure, FP-rate and ROC area. In this research, k-fold cross validation is also used for different values of k for Logistic Regression algorithm.

IV) EXPERIMENTS WITH WEKA

Weka is set of machine learning algorithms which are used for data mining tasks. Weka comprises of data preprocessing tools such as regression, classification, clustering, feature selection, association rules and visualization. Using website weka can be downloaded. The following figure 1 shows weka's preprocessing stage.

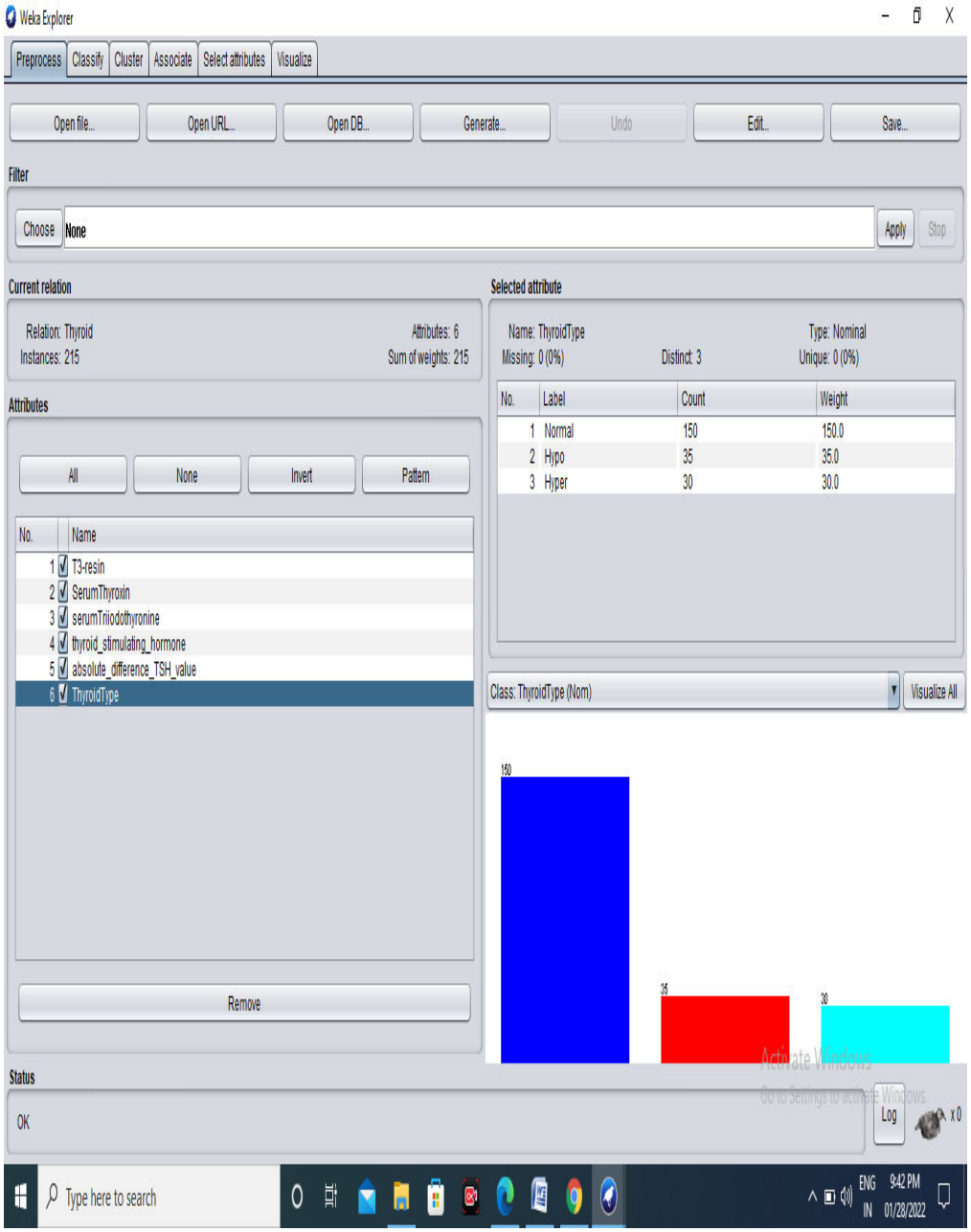


Figure 1

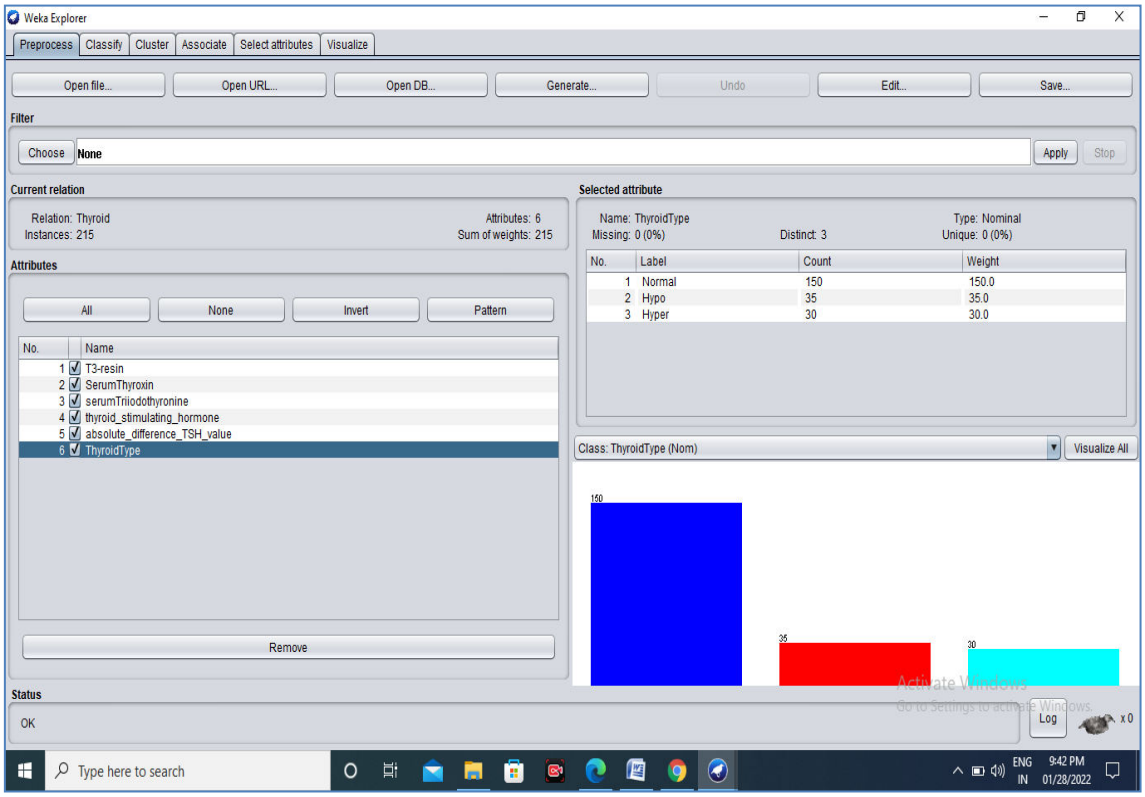


Figure 1

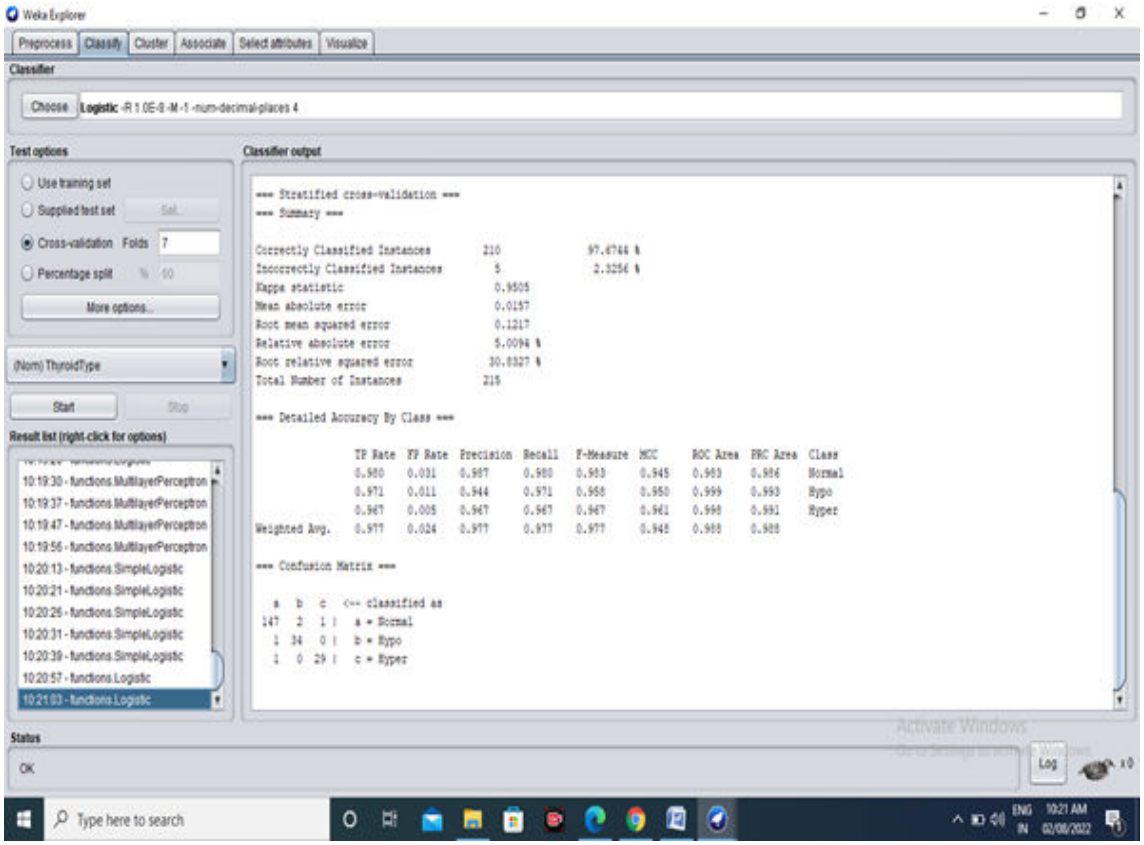


Figure 2 shows Logistic Regression Algorithm

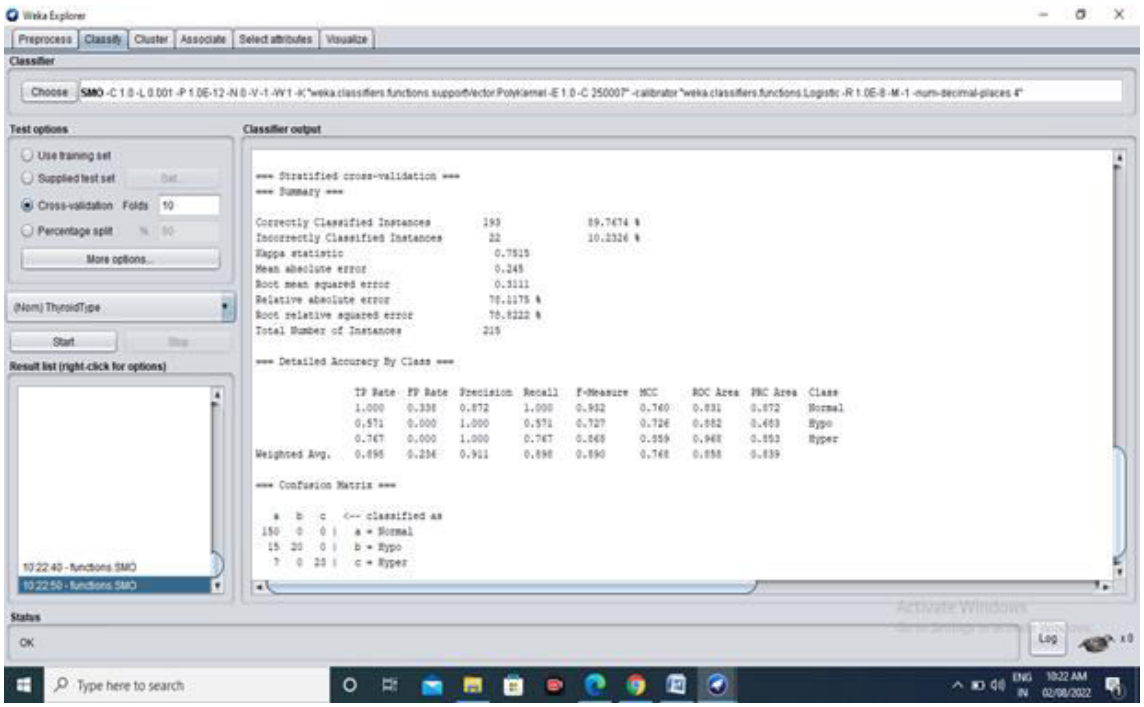


Figure 3 shows Support Vector Machine

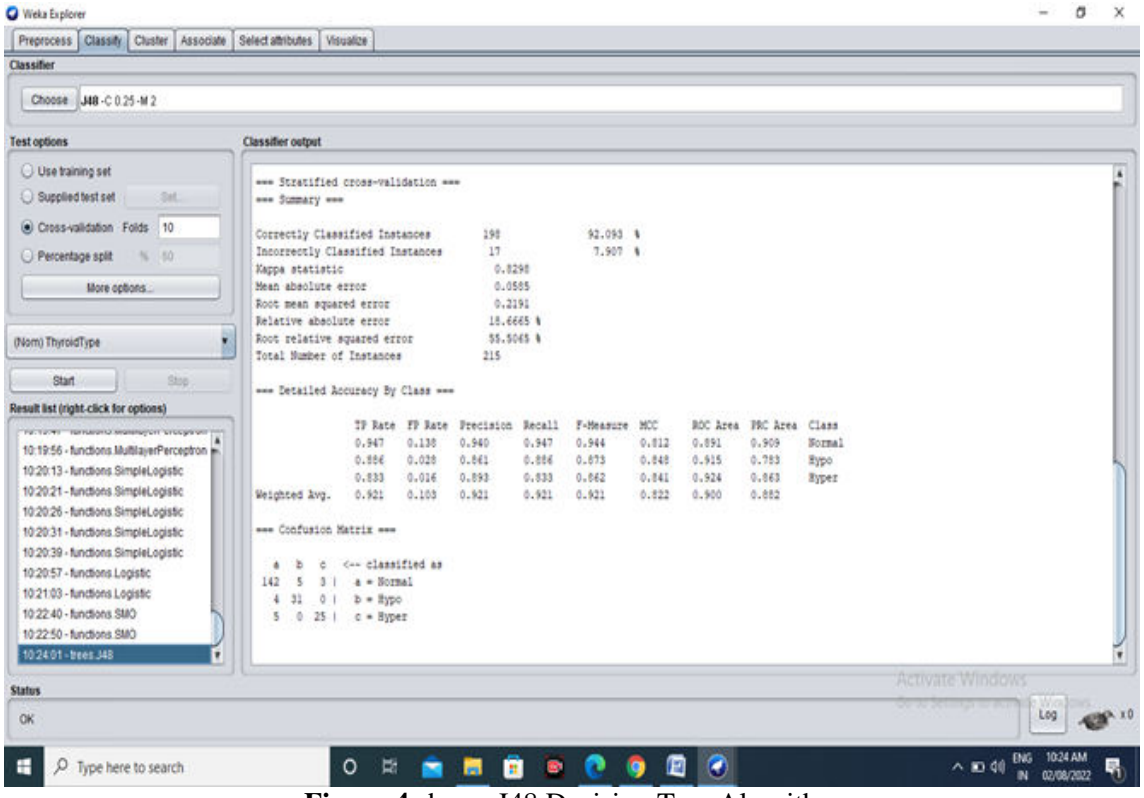


Figure 4 shows J48 Decision Tree Algorithm

V) RESULTS AND ANALYSIS

In the thyroid data set there are 215 records. The classifications of records are Normal, Hypo, Hyper. The dataset is given as input to Logistic algorithm. Confusion Matrix for Logistic Algorithm having cross validation with 7 folds is shown in following table,

Table 2

Target class	Normal	Hypo	Hyper
Normal	147	2	1
Hypo	1	34	0
Hyper	1	0	29

Table 3 shows accuracy for different K-folds for Logistic Algorithm

K=n	Accuracy	TP-Rate	FP-Rate	Precision	Recall	ROC Area
K=10	96.27	0.963	0.046	0.963	0.963	0.986
K=9	96.27	0.963	0.005	0.963	0.963	0.992
K=8	94.41	0.944	0.079	0.944	0.944	0.989
K=7	97.67	0.977	0.024	0.977	0.977	0.988
K=6	97.20	0.972	0.045	0.972	0.972	0.986
K=5	95.34	0.953	0.058	0.953	0.953	0.979
K=4	96.74	0.967	0.065	0.968	0.967	0.992
K=3	94.41	0.944	0.079	0.944	0.944	0.974
K=2	92.09	0.921	0.153	0.922	0.921	0.963

VI) CONCLUSION AND FUTURE SCOPE

In the field of health care, diagnosis of disease is highly complicated task. For decision making , different data mining techniques are helpful. In this research paper, Logistic data mining classification technique is employed to classify the data set along with k-fold cross validation. The Logistic algorithm has given 97.67% accuracy along with k=7 fold cross validation. As the accuracy of Logistic algorithm is more than other data mining classification algorithms, it is used for prediction of thyroid disease.

REFERENCES

1) Dr.D.Anitha, Mrs.S.SathyaPriya “Performance Improvement with Multiple Approaches to Predict Disorders Caused by Thyroid Disease” IOSR Journal of Computer Engineering (IOSR-JCE) e-ISSN: 2278-0661,p-ISSN: 2278-8727 PP 25-29 www.iosrjournals.org

2) M.T.Raghuraman , Dr.E.Sailatha , and Dr.S.Gunasekaran “EFFICIENT THYROID DISEASE PREDICTION AND COMPARATIVE STUDY USING MACHINE LEARNING ALGORITHMS” INTERNATIONAL JOURNAL OF INFORMATION AND COMPUTING SCIENCE Volume 6, Issue 6, June 2019 617 ISSN NO: 0972-1347

3) Hetal Patel “An Experimental Study of Applying Machine Learning in Prediction of Thyroid Disease” International Journal of Computer Sciences and Engineering Vol.7(1), Jan 2019, E-ISSN: 2347-2693

4) G. Rasitha Banu “Predicting Thyroid Disease using Linear Discriminant Analysis(LDA) Data Mining Technique” Communications on Applied Electronics (CAE) – ISSN : 2394-4714 Foundation of Computer Science FCS, New York, USA Volume 4– No12, January 2016 – www.caeaccess.org

5) Sayyad Rasheeduddin, Kurra Rajasekhar Rao “Constructing a System for Analysis of Machine Learning Techniques for Early Detection of Thyroid” International Journal of Engineering and Advanced Technology(IJEAT) ISSN:2249-8958 Volue-8 Issue-6S3, September 2019

6) Suwarna Gothane “Data Mining Classification on Hypo Thyroids Detection: Association Women Outnumber Men” International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-8 Issue-6, March 2020

7) Srinidhi C R , Dr. Prabha R "Prediction of Thyroid Disease Using Machine Learning Techniques" International Advanced Research Journal in Science, Engineering and Technology Vol. 8, Issue 3, March 2021 DOI: 10.17148/IARJSET.2021.8318

8) S. Sathya Priya , Dr. D. Anitha "Survey on Thyroid Diagnosis using Data Mining Techniques" International Journal of Advanced Research in Computer and Communication Engineering ICITCSA 2017 Pioneer College of Arts and Science, Coimbatore Vol. 6, Special Issue 1, January 2017

9) SURESH KUMAR KASHYAP, DR. NEELAM SAHU A COMPARATIVE STUDY OF MACHINE LEARNING BASED MODEL FOR THYROID DISEASE PREDICTION IJCRT2104272 International Journal of Creative Research Thoughts (IJCRT) www.ijcrt.org 2140 Volume 9, Issue 4 April 2021 | ISSN: 2320-2882

10) Shaik Razia, P. Swathi Prathyusha, N. Vamsi Krishna, N. Sathya Sumana "A Comparative study of machine learning algorithms on thyroid disease prediction" International Journal of Engineering & Technology Website: www.sciencepubco.com/index.php/IJET 7 (2.8) (2018) 315-319

11) uresh Kumar Kashyap, Dr. Neelam Sahu Resea "AN ANALYSIS OF PREDICTIVE MODELS FOR THYROID DISEASE USING MACHINE LEARNING TECHNIQUES" International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 Volume: 08 Issue: 03 | Mar 2021 www.irjet.net p-ISSN: 2395-0072

12) https://medium.com/@nilimakhanna1/j48-classification-c4-5-algorithm-in-a-nutshell-24c50d20658e

13) https://www.javatpoint.com/machine-learning-decision-tree-classification-algorithm

14) https://www.javatpoint.com/logistic-regression-in-machine-learning

A SYSTEMATIC STUDY OF WEB 3.0

Amey Pradip Khoje[1] and Sudeshna Roy[2]
[1]BVIMIT, Navi Mumbai
[2]Assistant Professor, BVIMIT, Navi Mumbai

ABSTRACT
In this paper, we have done a study of Web 3.0 and done a SWOT analysis on Web 3.0 to explore more on this. We have done an overview of Web 3.0 so we are able to conclude its benefits and challenges/threats.

Keywords: Web 3.0, Web Technology, SWOT Analysis

1. INTRODUCTION
Web 3.0 is a new form of the web which will represent the web in a different way. Like in the previous version we had dynamic content, responsiveness, and all. In this version, we will have a web page served as a database in a distributed format like blockchain. While using this we might think that from time to time the way data is shown or expressed on these platforms is getting changed. Like take the example of web apps/websites, there are versions of the web which differ in their functions. Web 1.0, Web 2.0, and Web 3.0 are three known versions of the web. Now the question is how do these 3 web versions differ from each other? The answer to that question is with the 1st version of the web we displayed web pages with help of table structures. At that time, there was no dynamic content serving in web 1.0 and pages built using server-side, and content served in file's system manner. Similarly in Web 2.0, it is a pretty dynamic data serving version where we see dynamic content, advertisement, and specific flow added to the web with this version. The dynamic word refers to content that is presented the way it is generated with the help of user input. This web also moved to PWA and normal Web Apps with different web technologies, responsiveness is getting added with this 2.0 version of the web. Now let's see about 3.0, in 3.0 web is presented as a database that is based on blockchain. Web 3.0 is also called as Semantic web. Web 3.0 content is served with Artificial Intelligence so the user will get exactly what the user is looking for. Web 3.0 will have 3D Graphics so the viewing experience will change [4].

2. LITERATURE REVIEW
Web 3.0 is a new way of working on the web, like the up-gradation of features. Web 3.0 will be getting served from databases that will be linked with blockchain. Decentralized data networks are the form in which data will get presented on web 3.0 Decentralised data networks are making it possible for these data generators from an individual's personal health data to a farmer's crop data, or a car's location and performance data) to sell or barter their data without losing 1 ownership control, giving up privacy, or reliance on third-party middlemen. As such, decentralized data networks can bring the entire long tail of data generators into the emerging 'data economy'. Artificial intelligence is powerful enough to generate meaningful data wherever we want. User will only get what he/she exactly wants to see on the web. When decentralized data is structured gives access to a wealth of data that could be great for today's tech giants

3. OBJECTIVE/SCOPE
The objective of web 3.0 is very huge and deep as it has very much small-small features. Decentralized data comes with handling data in a different way, not like normal SQL and NoSQL databases. It applies different data structures and ways to present data on the web. Like in the current scenario we are having large databases such as SQL, and NoSQL but these databases are centralized means all data is stored in one place elsewhere in decentralized database data is stored in a small chunk of data so the meaningful retrieval of data is possible.

The help of Artificial Intelligence and Machine Learning algorithms on a decentralized database makes this more powerful as a new way of presenting/fashing data [3]. AI and ML add a way of retrieving only needed data to the user that the user wants to see with helpful resources [3]. In addition to these, web 3.0 also comes with 3D Graphics, like on the current web we are using only 2D Graphics that will be changed to 3D. This will change the user experience to work n the web.

4. SWOT ANALYSIS ON WEB 3.0

SWOT analysis is a method that is used to evaluate/analyze anything that could be a Strengths, Weaknesses, Opportunities, and Threats of the project. With the help of SWOT analysis, we get an exact overview of the project with these four aspects. Let's take a look at Web 3.0 with these four aspects.

4.1Strengths

1. **Search Engine Capabilities**: Traditional search engines cannot be compatible in two major areas, that is, the reliability of the resources and the consistency of the information obtained by a search engine. Indigenous language analysis and Web 3.0 technology will allow the search engine to organize information based on the context within the doc2 ument and not just clause recognition. Web 3.0 technology will contribute to the creation of an intelligent search engine by using XML metadata tags, and the information in question will be searched. XML collected metadata will then be exported to RDF format. This will create a website where information will be released. (Ref 1) Semantic search engine powered by Web 3.0 technology may cause

a. Increased reusability of information

b. Advanced co-operation and expert findings

c. Knowledge exchange and time-saving

2. **Business intelligence:** Business Intelligence is a type of technology which used to gather all raw data and convert it to meaningful data so it can help in improving decision making. Web 3.0 will present the following benefits associated with BI implementation: (Ref 1)

a. Reduced cost of IT infrastructure

b. Opportunity to increase the effectiveness of e-commerce

c. Time-saving for data suppliers and users and the reduction of information bottlenecks

d. Timely and informed decision-making

3. **Knowledge management:** Information management is focused on the release of contextual knowledge and your regeneration through experience and imagination process for a specific end-user. Information management is a new creation of information based on user knowledge and understanding of specific information. Knowledge management includes a variety of tools, strategies, and processes to manage organizational information and intellectual property. The following key benefits are associated with efficient knowledge management: (Ref 1)

a. Reduced research time

b. Business benefits

4.2Weaknesses

The ever-present security challenges in this new Web 3.0 combine data reliability, metadata control, and the privacy implications of large data integration. On the web 3.0, RDF Schema (RDFS) and Web Ontology Language (OWL) develop direct URI-based integration of data into

one RDF store but without defining the boundaries of trust8 of this newly created data. The design of all applications is based on data integration and performance across the web. But the level of reliance on data and job commitments are uncertain. This level of trust can be even more suspicious if attackers deliberately manipulate data and produce such services that they do not do, which they should do. Controlling new metadata is another Web challenge 3.0 application. Sharing this large amount of data can change all business models in current markets. The Push approach will be replaced by a drag method; Artificial Intelligence (AI) agents will only deliver high-quality required numerical information. To sum this up valuable information on new systems can be disruptive to the whole series of a number of current business models. Another important concern for the security of Web 3.0 applications is the secrecy of large data sets. If someone allows you official access to the tags/baggage good data, assuming you will have good control of it, what will happen if you make a mistake and publish it to the world for whom to use? Illegal and modified forms of the same type of data will be available on the web, which will lead to the repetition of mistakes by anyone. Above are a few key safety issues for newcomers developed by Web3.0; where we will get closer to it you will feel that it is really complicated and full of challenges rather than a personal web. (Ref 2)

4.3Opportunities

1. **Web Services:** Web services here refer to websites that provide not only static information and allow user interaction and contribution to information, but also have the ability to create new Web Services which are based on user preference

a. **Automatic Web Service Discovery:** Describes the ability to obtain information on web services. Web 3.0 provides the ability to register semantic descriptions on Web Services on Universal Repository

b. **Automatic Web Service Invocation:** Basic tasks performed by IA on behalf of the user depending on the parameter set for an agent. When each Web Service is described by metadata available in the machine-readable format then Web Service invocation is possible.

c. **Automatic Web Service Composition and Interoperation:** Web application software can be written to manage these libraries as well, and the most stated goals, enable the automatic creation of new Web resources to achieve goals.

2. **Agent-based Information Harvesting and Distribution:** Agent-based distributed computing refers to a shift in computer paradigm from information distributed by client-server initiative. (Ref 1)

4.4 Threats

Unauthorized access to sensitive information. The power of Web 3.0 technologies to personalize the use of the Web, and IAs to harvest browsing history and personal information to create a Web automatically, will reveal a new level of privacy concerns. Okwe Web 3.0 vision for automatic success, protocols need to be installed internally Web 3.0 technology to deal with security, privacy, and unauthorized modification issues unauthorized access and fraudulent data into four categories:

1. **Unauthorized Access:** Access to and collection of sensitive information in the business system without verification. Authorization The risks associated with Web 3.0 technology are non-existent authentication of anything used or when password authentication is used present, but transmitted in plain text format using SOAP headings. Another threat is where basic assertions are made, but data is transmitted via unencrypted channels or when the system receives default passwords.

2. **Parameter Manipulation:** This refers to data interference while it is transmitted over a network. Risks exist in systems data packages that are not digitally signed or encrypted for providing privacy and proof of disruption prior to network transmission.
3. **Network Eavesdropping:** This is often accomplished through careful monitoring of copyright information software contained in SOAP articles. The main risks of the system include small encryption in both messages and transport standards and verification data stored in a blank document in SOAP topics.
4. **Message Relay:** This type of attack allows an unauthorized person to do so capture the data sent over the network and return it to the publisher. Usually, the attacker will change important information in the message, such as a delivery address, and return it to the publisher. System vulnerabilities include messages that do not have ID numbers for verification that duplicate messages are blocked, unencrypted messages, and messages digitally signed.

5. **ARCHITECTURE**

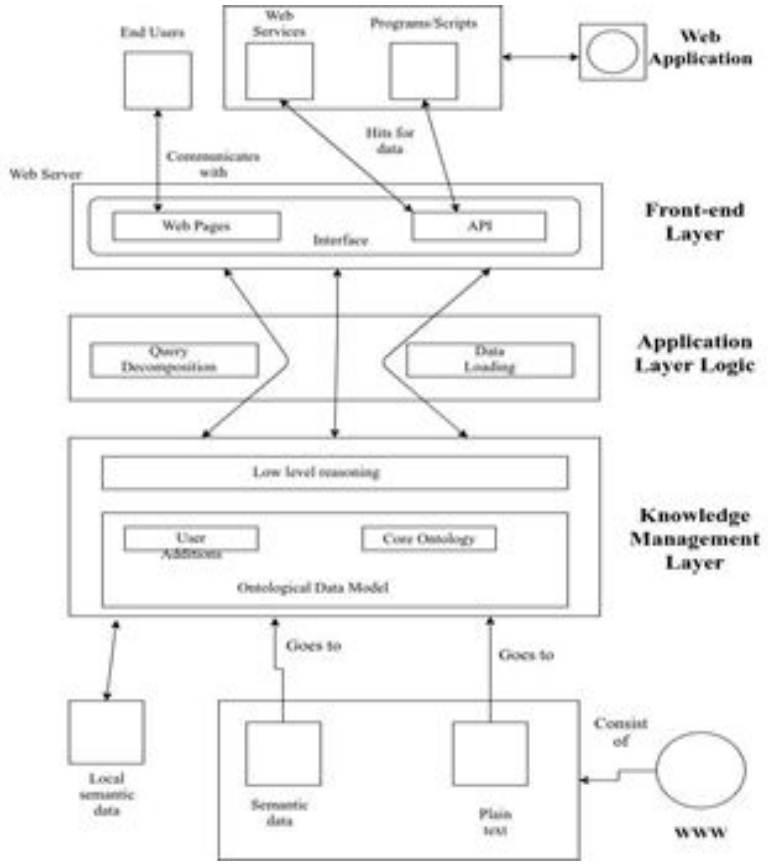


Fig 1: Architecture of Web 3.0 [5]

The Fig. 1 shows the Architecture of Web 3.0, let's take a closer look at it. So, Firstly - WWW(World Wide Web) which is known as the web, which we use to explore web-related things like websites, web apps, etc. It consists of Plain Text and Semantic Data that we see on a webpage that goes to the Ontological Data Model which consists of Core Ontology and User Additions which come under the Knowledge Management Layer which is basically finding correct information on the web which is under communication with Application Layer Logic which includes Query Decomposition and Data loading and then provides data to Front End Layer which consist of Web Pages and API.

6. AREA OF APPLICATIONS

6.1 Semantic Web: Web 3.0 comes with Semantic web which is basically improving the search of users by converting it to meaningful words and providing most-related data to users.

6.2 Artificial Intelligence: Artificial Intelligence is a great way to provide meaningful information to users by processing it. Processing and finding what the user is actually looking for can simplify user search and more comfortable.

6.3 3D Graphics: 3D Graphics will be used over websites which will make them more attractive.

6.4 Decentralized Data Storage: In decentralized data storage data is encrypted and more secure, it is fast to fetch and process. Cost-efficient and storing and accessing files is faster.

7. CONCLUSION

Web 3.0 is a new way of using web technologies. It will enable many unique factors which can be useful for users as well as developers/companies. Web 3.0 will open new opportunities to explore for everyone. Data management all-over web will be changed with rolling over to Web 3.0. With AI/ML and Blockchain there are many aspects that will get used in the web and 5 this could help in improving the web in every aspect like speed, data representation, user-friendliness, etc. Although Web 3.0 also has some weaknesses and threats as we can read in this paper. Every technology comes with a good part and bad part as well. From time to time technologies will overcome these factors and will get better day by day

8. REFERENCES

[1] Hendler, Jim. ”Web 3.0 Emerging.” Computer 42.1 (2009): 111-113

[2] Pattal, Malik & Li, Yuan & Zeng, Jianqiu. (2009) - Web 3.0: A Real Personal Web! More Opportunities and More Threats

[3] What Is Web 3.0 & Why It Matters (Online) - https://medium.com/fabric-ventures/what-is-web-3-0-why-it-matters-934eb07f3d2b

[4] Web 1.0, Web 2.0 and Web 3.0 with their difference (Online) - https://www.geeksforgeeks.org/web-1-0-web-2-0-and-web-3-0-with-their-difference/

[5] Pomonis, Tzanetos, et al. "Towards Web 3.0: A unifying architecture for next generation web applications." *Handbook of Research on Web 2.0, 3.0, and X. 0: Technologies, Business, and Social Applications*. IGI Global, 2010. 192-20

QUERENCIA: A REAL-TIME BIOMETRIC AUTHENTICATIONATM SYSTEM

Nidhi Rohra, Riddhi Khole, Nachiket Joag, Muheet Rashid and Mannat Doultani
Computer Science, Vivekanand Education Society's Institute of Technology, Mumbai

ABSTRACT
In India, the concept of Bio-metric detection- based systems is not wide-spread. The bio metric data is already recorded at the banks but not used extensively. Bio-metric data being unique to the individual and not capable of being dupli- cated, can be used to ensure greater accuracy of identification. Currently, the ATM systems in India work on PIN meaning that if someone has the ATM card and its PIN, he/she can access the account. But this can prove dangerous because if an attacker surfsthe PIN and somehow manages to steal the ATM card, he can empty the bank account within seconds. So, to increase the level of security in this traditional ATM process, we plan to develop an encrypted bio-metric authentication system that would provide a 2-step authentication by using the bio-metric characteristics of an individual which include fingerprint and iris patterns along with PIN in order to ensure maximum security and prevent such attacks.

Index Terms: Fingerprint Recognition, Iris Recognition, Bio- metric, Security, ATM systems

I. INTRODUCTION
To address the problem of security in traditional ATM systems, fingerprint as a bio-metric authentication is imple- mented in very few banks, across the globe. Very few banks in the market have access to such systems. But the cases of fingerprint forgery is noticed, which is the drawback of such systems. To overcome this drawback, we aim to provide multiple layers of security into the systems which includes a two-step encrypted bio-metric authentication. Our project aims to improvise the existing systems by introducing new technologies. It ensures ease of access to the customers and a multi-layer secured system for transactions.

II. RELATED WORK
[1] throws light on the recent studies on the fingerprint recognition system and ex plains its conceptual as well as structural details including the four stages of finger print recognition process and the summaries of fingerprint databases along with their characteristics. [2] attempts to provide a comprehensive scoping of the fingerprint recognition process issues, address its major design and implementation problems, and provide an insight into its prospects. [3] proposes a method for an efficient and secured bio-metric-based user identification system based on minutiae mapping in order to extract the finger, iris and palm print and also discusses RC4, DWT algorithm for encrypting and hiding the information.

[4] Discusses the four stages of fingerprint recognition but the main crux is upon the last stage of this process which is the matching (identification verification) stage used to match two minutiae points by using the minutiae matcher method which uses the similarity and distance measures. It also calculates theaccuracy of the system on the basis of FAR and FRR scores.

[5] Focuses on the most important post-processing stage of the fingerprint authentication process, viz. minutiae matching which is used to distinguish uniquely between various finger- print patterns. An algorithm for minutiae score matching has also been discussed. The research work has been done using C using a custom database of 100 fingerprint images from 25 different persons. Four different fingerprint images of the samefinger have been used for the bio-metric fingerprint matching experiment. The enrolment of 25 fingerprint images has been done, and other fingerprint images of users have been matchedwith already enrolled fingerprint images. Finally, a similarity score has been calculated for differentiating between the original fingerprint image and the enrolled fingerprint image. aims to eliminate the use

of ATM cards completely and to ensure better security. In the proposed system, the idea of using Aadhar number as user ID and fingerprint as password instead of the PIN number is discussed. After bio-metric verification, the user will be allowed to proceed with the transaction of their choice. In case of three successive wrong attempts, the account will be blocked. The main motive is to replace the traditional insecure ATM transaction scheme using PIN which can be misused easily with a modern and a more secure bio- metric authentication scheme. [7] surveys the image quality of images acquired from a standard camera and recognizes the most imperative issues in this regard. The purpose of this project is to study the unique pattern of the iris in the human eye and measure the performance on the basis of variousfactors which introduce errors and influence the execution and accuracy of this idea like different types of noises and reflections from light sources. [8] provides a timeline review of various iris recognition techniques, developed since 1993. It also talks about the iris recognition framework and iris databases. [9] presents a literature survey related to the iris recognition system. The aim of this paper is to explore recent developments in iris recognition systems, the process flow and algorithms used in various stages of the iris recognition system. [10]throws light on an ATM banking system with the help of an optimized and secured AES algorithm. To achieve an ATM system with less power consumption, the AES algorithm has been proposed in this paper using a combination of bio-metric and cryptography-based techniques. The paper also analyzes the speed metric of the processor and also compares it with other studies in ASIC technology to prove its efficiency.

III. METHODOLOGY AND IMPLEMENTATION

A. Fingerprint Recognition

R-305, being the serial scanner, we have used serial commu- nication between the scanner and the Python code. For every fingerprint captured by the scanner successfully, a unique fingerprint ID is assigned to it. The bio-metric fingerprints are stored securely within the scanner itself. We retrieve the fingerprint ID during the matching process to uniquely identifythe customer.

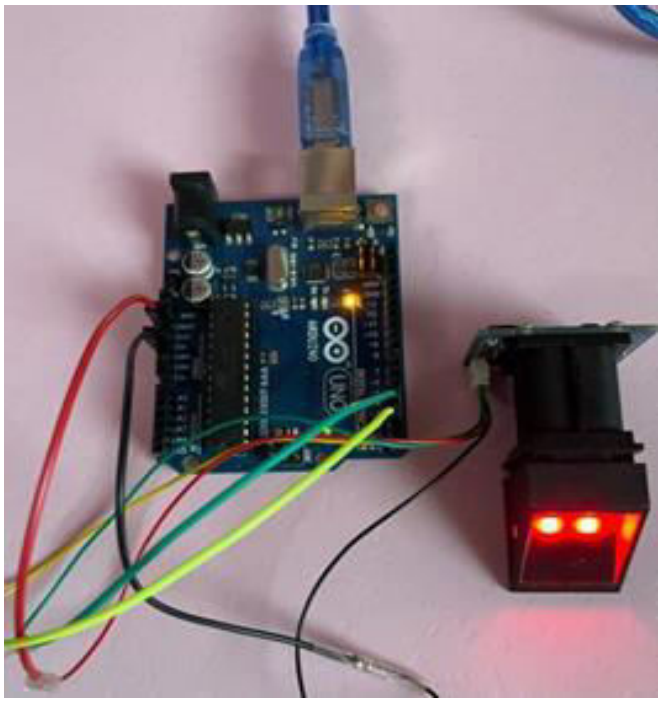


Fig. 1: R-305 Fingerprint Module

Place the finger on the scanner when asked by the appli- cation (before per-forming any transaction).If the finger has been placed properly, the fingerprint gets captured properly. The captured fingerprint is then compared with the stored fingerprint and if a match is found, the application directs us towards iris recognition. The finger must be placed firmly while registering the fingerprint to capture more details and increase the accuracy.

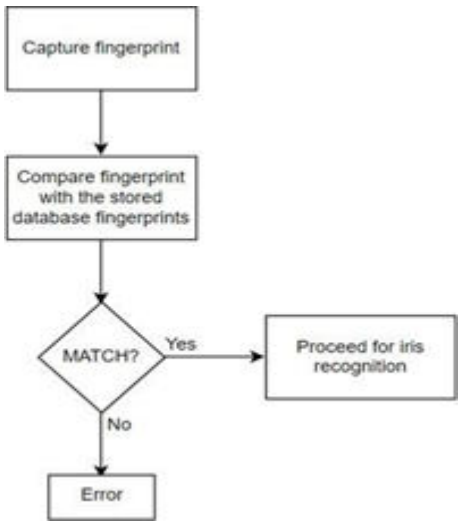


Fig. 2: Fingerprint recognition flowchart

B. Iris Recognition

The main steps in iris recognition are enrolment, verification and identification. For both enrolment and verification, the iris image has to undergo preprocessing stages of localization, segmentation, normalization and feature extraction. The com- monly used algorithms like the Hough transform, rubber sheet model, wave-let, Gabor filter, and hamming distance would be used in iris recognition stages. Visible and near-infrared light scanners are used to take a high-contrast image of the user's iris. Iris recognition phases:

- Segmentation.
- Normalization.
- Feature Extraction.
- Matching.

1) Segmentation

- Circular Hough transform is used to detect radius and center coordinates of pupil and iris region. Parabolic Hough transform is used to deduce eyelids. It is a time- efficient but less accurate process.
- Daugman Integro-differential operator locates the iris and pupil region along with the border of the iris. It is a time consuming but more accurate process.

2) **Normalization:** Daugman rubber sheet model Produces the iris region by nullifying the effects of dimensional in- consistencies. Transforms a segmented image into a fixed dimensional rectangular box and polar conversion of the iris image is done.

3) **Feature Extraction:** The Gabor filter used, is sensitive to textures with specific orientation and wavelength. Based on feature extraction, unique iris templates are generated. The ex-tracted features are encoded to generate unique mathematical templates for the iris.

4) **Matching:** Both the iris templates-iris template received from ATM and template stored at

the Bank's database, are compared to check similarity and dissimilarity. Matching is performed using the Cosine Distance metric. The other proposed equations are the Weighted Euclidean distance and Canberra distance metric.

IV. RESULT AND ANALYSIS

A. Fingerprint Recognition Module

In a bio-metric system, the primary evaluating factor is the accuracy of fingerprint recognition and Iris recognition. In this system, the fingerprint recognition module and the iris recognition module give nearly 100 % Accurate results. One of the reasons for this accuracy is that we have considered One-to-one (1:1) matching of fingerprints in the database. One-to-one (1:1) matching is typically used in cases where security is a high priority. This method is more secure than 1: N be-cause 1:1 matching requires the person to present information that identifies themselves.

However, before implementing this system we underwent multiple approaches and compared the accuracy of those systems. We built a fingerprint recognition system using MATLAB, and the Minutiae Score Matching algorithm to compute a similarity score. Based on this similarity score and the threshold score, it deter-mines whether the fingerprint is matched or not. This system gave an accuracy score of about 87 %. Since FMR and FNMR are the most common metrics used to evaluate the performance of bio-metric systems, EER(Equal Error Rate) is computed which is the crossover between the FMR and FNMR. Since EER is inversely proportional to the Accuracy of the system, the lower EER value suggests our system is quite accurate.

Since we have used the R-305 fingerprint module, which is a high-precision and high-performance device, our system has an accuracy of nearly 100 %, provided that the user is registered and has an account with the bank.

B. Iris Recognition Module

For iris, if the cosine distance is more than the threshold, then it is 1 (accepted) otherwise it is 0 (rejected). Thresh- old=0.97 gives accurate results. The value of the correct correction rate(crr) is given by the count of the iris that are correctly matched divided by the count of the total number of iris. Thus, we calculate crr cosine value.

To calculate ROC, we use the matching-cosine. ROC we got from IrisMatching() and compare it with our actual matching- cosine answer to calculate the FMR and FNMR.(Refer Fig.4)

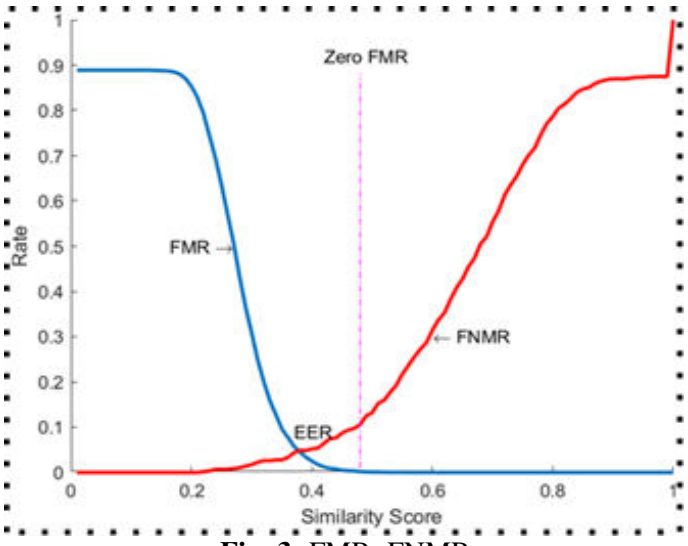


Fig. 3: FMR FNMR

```
Performance evaluation
ROC Measures :

Threshold       0.965
CRR cosine     36.000
FMR             0.640
FNMR            0.000
Name: 0, dtype: float64

Threshold       0.968000
CRR cosine     69.230769
FMR             0.307692
FNMR            0.000000
Name: 1, dtype: float64

Threshold       0.969000
CRR cosine     81.818182
FMR             0.181818
FNMR            0.000000
Name: 2, dtype: float64

Threshold         0.97
CRR cosine     100.00
FMR              0.00
FNMR             0.00
Name: 3, dtype: float64
```

Fig. 4: ROC measures

$$FMR = \frac{Numberofimagesincorrectlyaccepted}{Totalnumberofacceptedimages}$$

$$FNMR = \frac{Numberofimagesincorrectlyrejected}{Totalnumberofrejectedimages}$$

I. SCREENSHOTS

The image shown below (Refer Fig. 5) is the main page of our proposed system, where a us-er will be asked to enter the account number and the PIN provided. If the user needs some help he/she can click on the HELP button.

Fig. 5: Home Page

The Fig. 6 is the Dashboard of our proposed system, where a user can select any of the Four options provided. A user can choose to Withdraw money, Deposit, Check Balance or Change PIN.

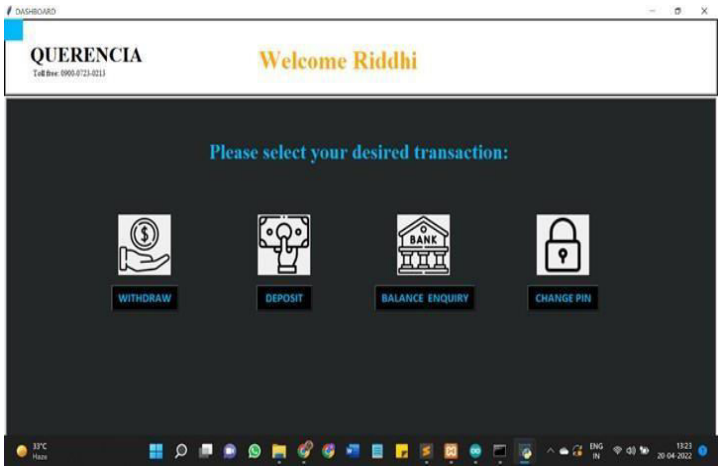


Fig. 6: Dashboard

The Fig. 7 shows the Authentication page, where a user will be asked to prove his identity via Fingerprint matching and Iris Scanning. On successful verification, the user will be granted access to the transaction and his process will be proceeded further.

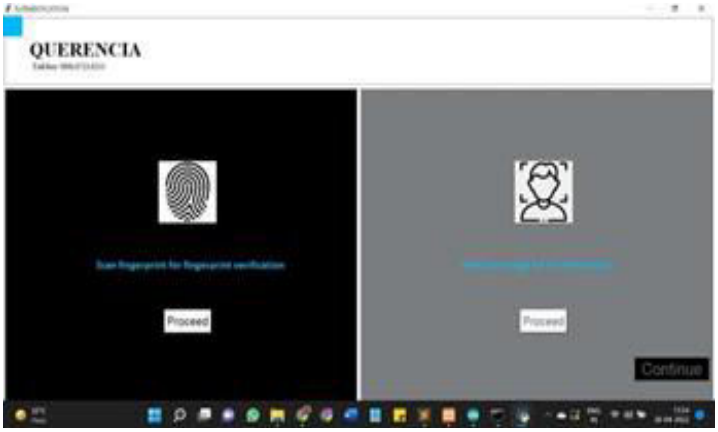


Fig. 7: Bio-metric Authentication

V. FUTURE SCOPE

Introducing the concept of nominees for user authentication: In cases of emergency such as an accident or death of an account holder, his/her bio-metric pat-terns cannot be used for authentication. In such scenarios, his/her closest relative/s should be allowed to access the account. Hence, their finger- print and iris patterns have to be stored in the database right at the time of the bio-metric registration of the account holder while opening a new bank account.

Detection of fingerprint forgery: Detecting attempts of iden- tity theft and violation and bypassing of the fingerprint au- thentication mechanism by using machine learning algorithms, raising a red flag immediately and reporting such cases to concerned authorities. Mobile app: A mobile app (for the respective bank) may be developed to authenticate the users directly via app (for those with mobile phones having a built- in fingerprint scanner and a camera) to further escalate their user experience.

VI. LIMITATIONS

- Some people (majorly senior citizens and illiterate peo- ple) may not feel comfort-able to use the technology- packed system due to digital illiteracy and/or less tech- nological acquaintance and hence may hesitate to use it.
- Normalization.

- Not suitable for people with eye problems (e.g. cataract surgeries which can alter the iris patterns in the eye leading to errors in bio-metric verification and hence would lead to a failure during user authentication).
- Not suitable for totally blind people.

VII. CONCLUSION

Although the bio-metric authentication system has been employed today in mo-bile phones and laptops heavily and for recording attendance in many schools and colleges, it has not been implemented in any other domain so extensively, espe- cially in the banking sector. Our solution could serve as a good attempt to utilize the bio-metric system in banking effectively as it is a blend of bio-metric and cryptography techniques. It is extremely difficult or rather almost impossible for the attackers to tamper with the system and bypass the 3-layer authentication procedure illegally. Thus, our proposed system guarantees a great level of security altogether. Such systems when deployed at banks, would be preferred by the customers which will indirectly have a positive impact on the business of banks. The bio-metric system is revolutionizing globally and many industries are innovating its usage across their products for the convenience and safety of their customers.

REFERENCES

[1] Ali, Mouad Mahale, Vivek Yannawar, Pravin Gaikwad, Ashok. (2016). Over-view of Fingerprint Recognition System. 10.1109/ICEEOT.2016.7754902.

[2] L Karthik Narayan, Sonu. G, Soukhya S. M, 2020, Fingerprint and its Advanced Fea-tures, INTERNATIONAL JOURNAL OF ENGINEER- ING RESEARCH TECHNOLOGY (IJERT) Volume 09, Issue 04 (April2020)

[3] Malathi R., Jeberson Retna Raj R.,An Integrated Approach of Physical Biometric Au thentication System,Procedia Computer Science,Volume 85,2016

[4] M. M. H. Ali, V. H. Mahale, P. Yannawar and A. T. Gaikwad, "Fingerprint Recognition for Person Identification and Verification Based on Minutiae Matching," 2016 IEEE 6th Inter national Con- ference on Advanced Computing (IACC), 2016, pp. 332-339, doi: 10.1109/IACC.2016.69

[5] Patel R.B., Hiran D., Patel J. (2021) Biometric Fingerprint Recognition Using Minutiae Score Matching. In: Kotecha K., Piuri V., Shah H., Patel R. (eds) Data Science and In-telli gent Applications. Lecture Notes on Data Engineering and Communications Tech-nologies, vol 52. Springer, Singapore.

[6] a J, Bhuvaneshwari. (2019). SECURE ENHANCED ATM WITH BIOMETRIC AUTHENTICATION

[7] Sevugan, Prabu Swarnalatha, P. Gopu, Magesh Sundararajan, Ravee. (2017). IRIS RECOGNITION SYSTEM. International Research Journal of Engineering and Technology.

[8] Nithya, Alice Lakshmi, C. (2015). Iris recognition techniques: A Lit- erature Survey. In ternational Journal of Applied Engineering Research. 10. 32525-32546.

[9] Nanayakkara, Samitha Meegama, R. (2020). A Review of Litera- ture on Iris Recogni-tion. International Journal of Research. 106-120. 10.32968/1632-2882.

[10] Nawaz, Ali Hossain, Fakir Khan, Grihan. (2013). Biometric Authen- tication Scheme for ATM Banking System Using Energy Efficient AES Processor.

IoT ENABLE UNDERGROUND CABLE FAULT DETECTION USING RASPBERRY PI

Ms. Pratiksha Varade, Mr. Atitesh Chalke, Ms. Shravani Pawar and Mrs. Rasika Patil
BVIMIT, Navi Mumbai

ABSTRACT
In Mumbai as population is very large, cables cannot be used in open space. It is very easy to find fault in open space cables and we can fix it very easily. But due to above reason we use underground cables for transmission purpose. As cables are underground it is very troublesome to detect fault and resolve it. Hence this paper represents the detection of underground cable fault. We use concept of "ohm's law" to detect fault. A set of switches have been used to represent the cable and a direct current is provided at input side and with the help of change in current, fault can be detected using an analog to digital converter and then raspberry pi displays the fault's latitude and longitude on LCD and then through Wi-Fi its exact latitude and longitude will be displayed on the website. Therefore, paper is about IoT enable underground cable fault detection using raspberry pi that is invent by us, which is capable of finding exact latitude and longitude where the fault lies, so the concern authority can directly get the hole dig at exact point and resolve the issue

Keywords: Underground cable, fault location, raspberry pi, putty.

1. INTRODUCTION
We are in the world of digitalization so towers are needed and many other electric power systems is required, as the need of technology is increasing rapidly, the number of cables in operation and their total length and usage has largely increased. Underground cables have been widely utilize due to cost efficient, tough nature and due to environmental concerns. To improve the trust ability of a distributed system, exact identification of fault in cable is needed in order to minimize intrusion time during fault. Fast and accurate fault detection plays an important role in fast system mending, minimizing outage time, minimizing financial deprivation and significantly improving reliability of system. A cable fault can be defined as any type defect, unpredictability, frailty or heterogeneous that influence the performance of a cable. Faults in underground cables are unique and the success of a cable fault detection system depends on its positive feature and the experience of the authority who is detecting fault. An efficient cable fault detection service companies should take care of electrical safety.

Cables in fault can be classified in three groups*:*

Open circuit fault, Short circuit fault, and line to line fault. Short circuit fault is of two types' symmetrical fault and unsymmetrical fault .

2. LITERATURE SURVEY
Till last decades i.e. till 2000 cables were made to put aerial and above the ground & currently it is put inside underground; which is superior level to earlier method. Because the underground cable are not affected by any unfavourable weather condition like earthquake, tsunami, tempest and so on. But, it is affected by any defect, unpredictability, frailty or heterogeneity in cable that affect performance of cable. When any fault occur in cable, it then becomes very difficult to detect the fault. So, we will move to find the exact location of fault in cable.

Table 1: References showing mode of fault detection

Sr	Name of the paper	Mode of fault detection
1.	Underground cable fault using distance locator[3]	Microcontroller
2.	Underground cable fault detection and identification via fourier analysis[5]	Fourier analysis
3.	A line to ground fault location algorithm for underground cable system [4]	To detect, classify, discriminate the transient and the reflected signal from noise and thus discriminate the fault position and locate the fault accurately on underground power cable system using stationary wavelet transform.
4.	A fault location technique using high frequency fault clearing transients[6]	a voltage recorder, is placed next to a breaker of current it is on the side of the transmission line, will find the location of permanent faults.

3. PROPOSED SYSTEM

As Cables are lay underground, it becomes very difficult to locate where exactly fault is present. By using microcontroller we can get to know where fault is there in the cable but exact longitude and latitude where fault exist still cannot be determined. And microcontroller functions are not open source so any addition in the system will be expensive. Hence, the objective of proposed system is to locate underground cable fault in kilometre. This is proposed model of underground cable fault detection using Raspberry Pi-3. It is classified in five parts – power supply, sensor board, controlling, sensor board and display part. DC power supply part consist of AC supply of 230V As we receive High AC to convert it into low Ac the first step is to use step down transformer is used to down convert the AC up to 15V. Next step is to convert AC into DC for that bridge rectifier is used. Secondary of transformer is connected to 4 diodes IN4007. And then Capacitor 1000 f & 1 f are used as a filter to remove the noise or any disturbance in the signal. Red led shows that rectify and filter is ok. 12V regulator is used in 7812 IC. It transforms 15V DC into regulated +12V DC. YELLOW led shows that output of 7812 is ok.7805 IC is used as a +5V regulator it transform 12V DC into regulated +5V DC green led shows that output of 7805 is ok. Sensor board is used to sense the fault and pass the output to opto isolator which will convert 5 V DC to 3.3V DC. And the output of opto isolator is passed to raspberry pi's pin. As raspberry pi 3 b model has 40 pins we can configure it using python language and software is Linux, operating system is raspbian. To find particular locations fault we need to identify that locations raspberry pi IP address so that we will connect with it and display output the fault on website. This procedure is done with the help of putty software.

4. METHODOLOGY

Nowadays people dig along the cable laid and then pull the cable out and then they check whether the fault exists in the cables or not, and the work of checking is done from the starting of the region. By doing this it consumes lot of time, money, man power is wasted. It is a tedious work. Instead of doing all such thing we can utilize same man in some other work which will help the company gain profit. On the other hand it not only effects companies but it also causes a lot of trouble to the normal public. We believe that our cable fault detection system will solve this issue to a great extent and will be really helpful for companies, institutes, housing societies and for normal people. We have designed our project very user-friendly and can be easily controlled. Also, the kit is cost effective. As we are using raspberry pi it is arm 11 based personal computer. Software of raspberry pi is Linux and operating system is Raspbian and we

are using python language for communication purpose between sensor board and with raspberry pi and as they all are open source. Our system is very cost efficient.

It's a difficult task to identify the faults in underground cables using traditional method. But, by using raspberry pi3 we can detect exact fault's latitude and longitude. Once faults occur in the cable, LCD displays that fault is detected and then exact latitude and longitude is displayed on website. It also displays which phase is affected in the cable and how long it's affected and amplifier will then amplify the signal and buzzer will be ON indicating fault is detected. Buzzer system creates an alerting sound signal, once the fault occurs in the underground cable.

In this project we detect all types of fault in the cable be it short circuit or open circuit fault. To find the open circuit fault capacitor is used in ac circuit which measure the change in impedance & calculate the distance of fault.

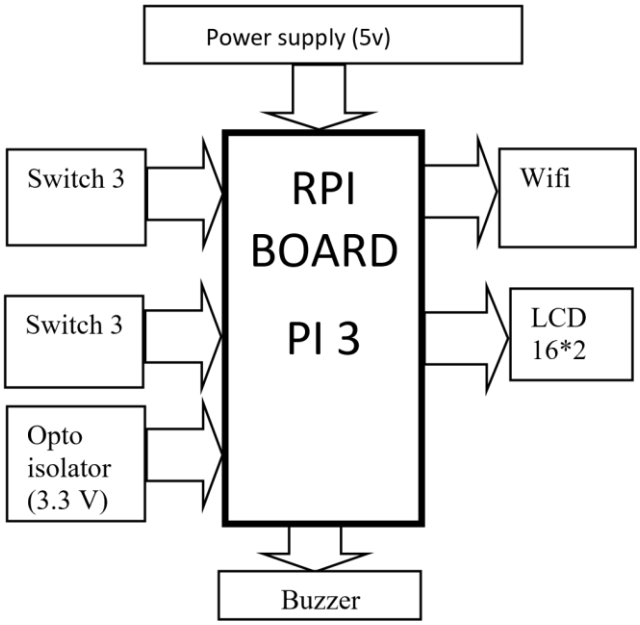


Fig. 1: Block Diagram of underground cable fault detection.

5. WORKING

To turn on Raspberry pi we require power supply of +5v DC .As we receive High AC to convert it into low Ac the first step is to use step down transformer (15V/1A) is used to down convert the AC up to 15V. Next step is to convert AC into DC for that bridge rectifier is used. Secondary of transformer is connected to 4 diodes IN4007. And then Capacitor 1000 f & 1 f are used as a filter to remove the noise or any disturbance in the signal. Red led shows that rectify and filter is ok. 12V regulator is used in 7812 IC. It transforms 15V DC into regulated +12V DC. YELLOW led shows that output of 7812 is ok.7805 IC is used as a +5V regulator it transform 12V DC into regulated +5V DC green led shows that output of 7805 is ok.

When we supply power to raspberry pi, it again has to reduce the current volt as raspberry pi needs 3.3V DC. For this we use opto isolator it converts +5 V to 3.3V. We use Sensor board where fault is detected and is given to raspberry pi and then after programming in python language we can display the fault type on LCD of 16*2. When fault is detected amplifier amplifies the signal and buzzer is ON.

Advantages:

1) Less maintenance
2) It has higher efficiency

3) 3) Cost effective.

4) Underground cable fault detection model is capable of detecting all types of cable e.g. CAT 5, CAT 6, Relimate wires, etc.

5) High speed model.

Disadvantage:

1) Cost of Raspberry Pi model increases.

2) Cost Increases of finding exact location with IOT.

Fig. 2 Raspberry Pi-3

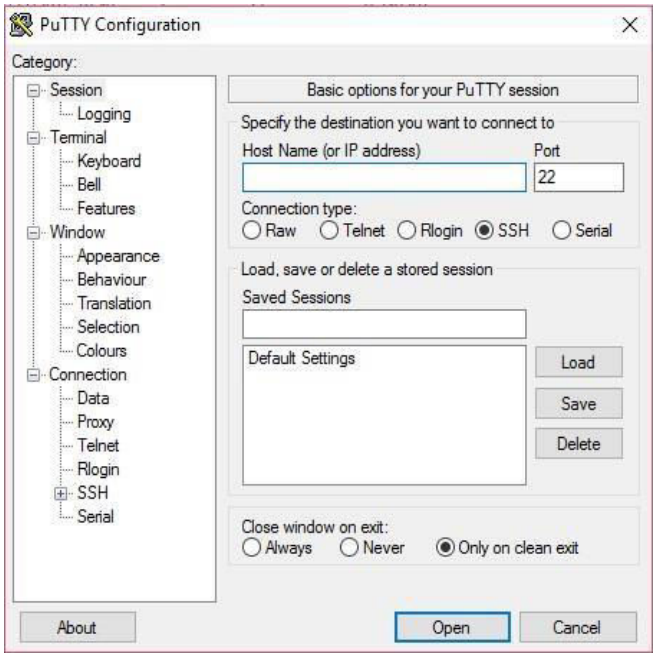


Fig. 3 Network connection putty.

16. 6. RESULT

The proposed system finds the exact latitude and longitude of the fault, and the result is displayed on website with exact location. The underground cable fault detection uses the concept of Ohms law, a DC voltage is given at the starting position of cable (resistor) i.e. in the sensor board, if fault is present then the current will vary, if at a particular point current is zero then voltage will also be zero that will indicate fault is present . This system uses a raspberry pi-3 and a +5V power supply. Here, the current sensor board which consist of wires and current sensor in combination with the resistors is interfaced to the raspberry pi with the help of an opto

isolator for giving output of fault. The fault is made up of switches. Relay driver IC is controlled by relays, which is used to check the cable line. The 16x2 LCD connected to the raspberry pi is used to display the information. In short circuit fault (Line to Ground), the voltage across the series resistors changes. It is then fed to an opto isolator to develop the precise data which is directed to the programmed raspberry pi in order to display the same in kilo meters in LCD.

7. CONCLUSION

Hence in IoT enable underground cable fault detection using raspberry pi we will find out exact fault location. It can accomplish advanced fault detection precision in underground cable, mainly for high impedance.

8. FUTURE SCOPE

In future, there would be more constructed sites on roads, due to which detecting the exact location of the fault and digging the ground for correction of faults would be difficult and tedious. Using Raspberry Pi it will be possible to get the exact longitude and latitude of the fault. This will enable the authorities to get the perfect location for digging at the right place and fix the fault consuming less time and also consume less man power. This will be also be cost effective.

9. REFERENCES

[1] J. Densley, “Ageing mechanisms and diagnostics for power cables an overview.” IEEE Electrical. Insulation. Mag, 14–22, Jan/Feb. 2015.

[2] Md. Fakhrul Islam, Amanullah M T Oo, Salahuddin. A. Azad1, “Locating Underground Cable Faults: A Review and Guideline for New Development”, 2013 IEEE

[3] B. Clegg, “Underground Cable Fault distance Locator”. New York: McGraw- Hill, 1993.

[4] M.-S. Choi, D.-S. Lee, and X. Yang, “A line to ground fault location algorithm for underground cable system,” KIEE Trans. Power Eng., pp. 267–273, Jun. 2005.

ANALYSING DATA USING WEB SCRAPING

Neelam Ramkumar Jaiswar and Suhasni Vijaykumar
BVIMIT, Navi Mumbai

ABSTRACT
As we know data is new money. Data is playing important role in every industry. There is many sources of data, Internet is one of them. In today's era internet generate more data than any other data sources. Now newspapers are available in digital format and each personal can access this information or data from anywhere.

In India every second thousands of web articles has been published, each web articles contains information about particular event, it may belongs to entertainment field, sports field etc. Every Information or articles available on web have their own structure. Collecting this data in particular format or structure and analysing it for future use is so challenging. To settle these issues, specialist spot out a new procedure called Web Scraping.

Web scraping, or web scratching, is a procedure which is utilized to create organized information based on accessible unstructured information on the web. This research paper includes the methods of extracting data from web and storing it into specific format and how to implement this method using python.

Keywords: web scraping, web scratching, python

1. INTRODUCTION
Data analysis may be a methodology of extracting solutions to issues through questioning and decoding information. The analysis method involves finding issues, partitioning the accessibility of acceptable information, and creating selections. Starting with specifications, assembling, organizing, cleaning, reanalysing, applying models and algorithms, and final results. internet info scraping and public support square measure nice ways for making entities naturally on the online. a big range of people have used these ways in analysis and business to make content and critiques, increasing the accuracy of company promotion that permits people to assign resources to the event and development of the corporate. Pages square measure factory-made utilizing content based mostly increase dialects (HTML and XHTML), and far of the time contain a profuseness of cooperative information within the content structure. Be that it should be as most web site pages square measure anticipated for human finish users and not for reductivism of robotized use. Thus, the chest that scrapes internet information was created. As for the paper are targeted on the information analysis mistreatment python`s effectiveness as a programming language, it`s bent associate degree apt alternative as one language for the datacentric application, for this, the version of Python used are Python three.6 for the analysis.

The principal purpose of the paper is to ponder a cycle of cleansing, changing, and demonstrating info to seek out useful information for business dynamic. The thrust behind internet scraped information analysis is to extract valuable information from the knowledge and create decisions supported investigation of the knowledge.

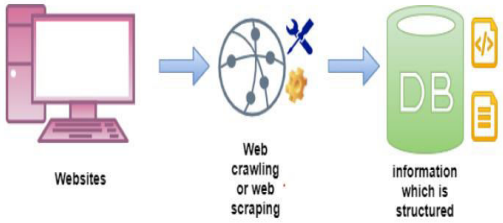


Figure 1: Web Scraping

2. LITERATURE STUDY

Kaushal Parikh and. al., [1] recommend using machine learning to detect web scraping It is useful for firms who rely on search. Web scraping is a difficult pre-emptive strike. Whenever a company places its data on the Internet, it is likely to that it can be copied and pasted and then used in another view without the knowledge of company. Many defense mechanisms have been proposed, but some of them continue to be ignored. So the importance of machine learning. Machine learning is quite good at detecting patterns. Therefore, if we manage to get the machine to understand the intruder's rhythm, it will prevent these types of threats from happening. Web scraping solutions are designed primarily to convert complicated data collected over the network into structured data that can be saved and analysed in a central database. So, web scraping solutions have a significant impact on the outcome of the cause.

Anand Saurkar and. al., [2] discovered the newest technique called Web Scraping. Web surfing is a vital way for generating structured data from unstructured data available on the internet. Structured data was formed, which was then collected and evaluated in spreadsheets in a central database. This study focuses on a summary of the web scavenging process, the different web extraction strategies, and most of the latest tools used for web crawling. The main function of this method is to get information from the web and integrate it into a specific repository. In this paper, the authors covered the fundamentals of web processing. They concentrate on online scraping techniques. The last part of the article provides a summary of the many technology resources available for effective web search in the industry.

Erin Farley and. al., [3] intends to introduce web scraping to law enforcement researchers, and illustrates what web scraping is and how it works. Criminal justice investigators are only recently beginning to use web crawlers. In a review of research on illegal liberties that used web scraping as the information collection method, only a series of trials were uncovered. Although web scraping is commonly thought of as a method of data collecting to facilitate analysis and study, the design and implementation of web scraping requires technological capabilities that many social scientists lack. A high level of expertise in computer techniques such as R or Python when developing source code is a must to create the web scraper.

3. RESEARCH METHODOLOGY

Web scraping can be performed in the following steps shown in figure

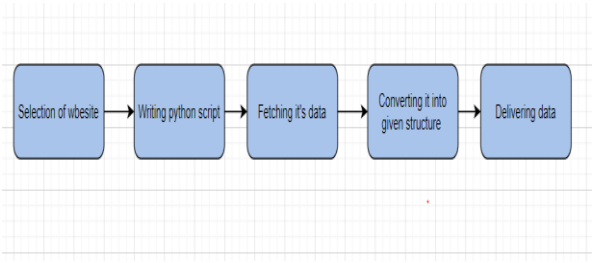


Figure 2: Step to scrap data from site.

The first step of scraping is to select website which you have to crawl and which kind of data do you want to scrap or extract.

After that, the technique is used to scrap the site is used here is writing python script. Python makes this task easier; it has built in libraries and functions.

Python libraries for scraping:

As we all know, Python has a wide range of applications and libraries for a variety of uses. In our further demonstration, we will be using the following libraries:

- **Selenium:** Selenium is a web testing library. It's used to automate web browsing.
- Beautiful Soup is a Python tool that allows you to parse HTML and XML texts. It generates parse trees, which aid in data extraction.
- **Pandas:** Pandas is a library used for data manipulation and analysis. It is used to extract the data and store it in the desired format.

The paper's methodology is to employ the web crawler's vivid features to collect all of the data retrieved from multiple sources.

Scrappy is a tool that uses python scripts to perform tasks. Examine it further in light of the customer's request, where the data is stored in the company's database Coding. The web crawling script that was utilized for a project that displays the data that was crawled.

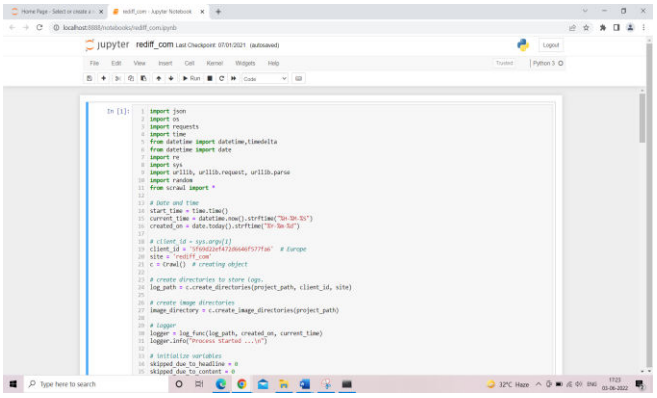


Figure 3: Code for Implementation of Scrapy

After Writing script you have to run the script and in node pad++ we have analysed the log file of that script.

Log file shows the information about how and what data getting fetched. It shows total count of data fetched, duplicate data and data missed by scripts.

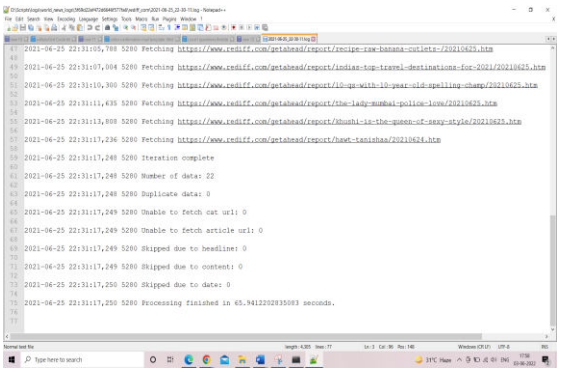


Figure 4: Log file

Site can be scrap in different way some sites contain RSS feed. It makes scraping easier. RSS feed ca be two type single or multiple. If site don't contain RSS feed, then we have to scrap using category wise or we have to search for all news section.

Life cycle of single RSS (really simple syndication) based websites:

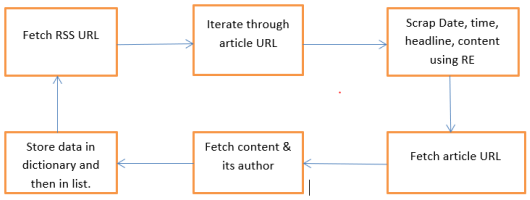


Figure 5: Single RSS websites life cycle

Life cycle of multiple RSS (really simple syndication) based websites:

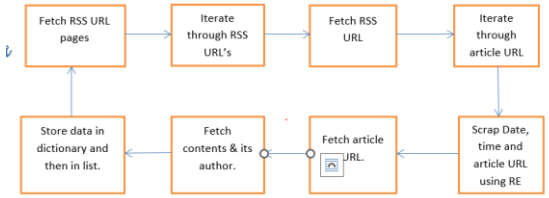


Figure 6: Multiple RSS websites life cycle

4. RESULT & ANALYSIS

This is the one of the best ways to scrap the data of website, it's given you a log file through which you can analyze so many things. You can keep a track of which article links data is not crawled, Total fetched data, duplicate data and total number of articles it has crawled.

It stores data in JSON format as shown in given image. Using this JSON format data analyst can analyze on which category has more article. Which category gives more entertaining new. This data helps so many entrainments industry.

Figure 7: JSON format data

5. CONCLUSION

Extracting data with scraping techniques is a new activity in the field of harvesting techniques. While many organizations still use manual techniques to extract data. web scraping solutions are transforming traditional data extraction methods. The day when can become an exponentially growing phenomenon in this area is not far away, and most companies are dramatically in the value of scraping innovation and the competition for to stay on top. Understand how you can be. This research paper gives us information about scraping using python. This includes an information about web scraping and it's features, common tools and technologies used for web scraping.

6. ACKNOWLEDGEMENT

The authors would like to be ever grateful to the anonymous reviewers who with their valuable inputs, suggestions and comments, have led to significant improvements to the content of this paper leading to a much better version of the same.

7. REFERENCES

[1] Renita Crystal Pereira and Vanitha T, "Web Scraping of Social Networks," International Journal of Innovative Research in Computer and Communication Engineering, pp. 237-240, Vol. 3, 2015.

[2] Anand V. Saurkar, Kedar G. Pathare and Shweta A. Gode, "An Overview On Web Scraping Techniques And Tools," International Journal on Future Revolution in Computer Science & Communication Engineering, pp. 363-367, Vol. 4, 2018.

[3] Richard Lawson," Web Scraping with Python",2015

[4] Ingolf Boettcher, "Automatic data collection on the Internet," pp. 1-9, 2015

[5] EMIL PERSSON, "Evaluating tools and techniques for web scraping", degree project in computer science and engineering, second cycle, 30 credits Stockholm, Sweden 2019

STUDY ON SUICIDE CASES USING DATA ANALYSIS

Emili George, Neha Gadodia and Prof Shravani Pawar
BVIMIT, Navi Mumbai

ABSTRACT

Suicide is defined as the deliberate cause of death. Many mental disorders, depression, in our data and find the relevance of our data.

Although suicide is a personal and personal act it is defined by a number of social factors. In the Indian context, Suicide is an important issue. More than 100,000 lives are lost each year in India as a result of suicide. Men are more likely to commit suicide than women and approximately 40% of those who commit suicide are under the age of 30. This is a matter of great concern because this age group tends to focus on the country's economic growth and development. Unemployed men and women who are housewives are quick to commit suicide. This places a huge social, emotional, and economic burden on our society. More than 6% of students commit suicide in India every year. India is at the forefront of youth suicide which is a major concern for the psychological and social care of students. Farmers who contribute to the 17% economic growth in India also have a higher risk of suicide. This is an important issue that needs to be addressed by the Indian government.

In our paper, we hope to reveal that there are many determinants such as Education, Status as well as Religion that can have a positive influence on mental well-being and harmful ideation. Other factors such as good parenting and schools teaching self-awareness can also reduce suicide risks in India Suicide is a sensitive issue that needs to be addressed. Since Data Science is a multi-sectoral field we can find patterns in our database and we can gain an understanding of why there is a high suicide rate in India. Our aim in this paper is to find a pattern and analyze the relationship between suicide rate and socio-economic metrics and mental health. Here we use python and different libraries to find the pattern relationship problems, and other causes of suicide. According to Wikipedia 0.5%, of people commit suicide every year and there are approximately 10 to 20 million suicide attempts.

Keywords: Analysis, Profession, Religion, Python, Suicide, Visualization.

1. INTRODUCTION

Each suicide is a personal tragedy that premature it takes a person's life too has a continuous flow effect, surprisingly affecting the lives of family, friends, and communities. While it is generally believed that a person committing suicide is due to depression but there are multiple other circumstances too. This implies that the mental well-being of a person can't cure suicidal thoughts. In our research paper, we found some additional factors that induce suicide and help reduce suicidal thoughts. Dataset utilized in our paper is from sources like Kaggle and NCRB. Our data is mainly tailored toward India. Dataset is mainly obtained from secondary sources i.e open sources accessible on the Internet. All the data is available freely and is open-sourced.

Dataset was cleaned and analyzed using Python opensource libraries such as NumPy, sklearn, pandas, scipy and was visualized using matplotlib and seaborns.

I. **Suicide Rate all over India**

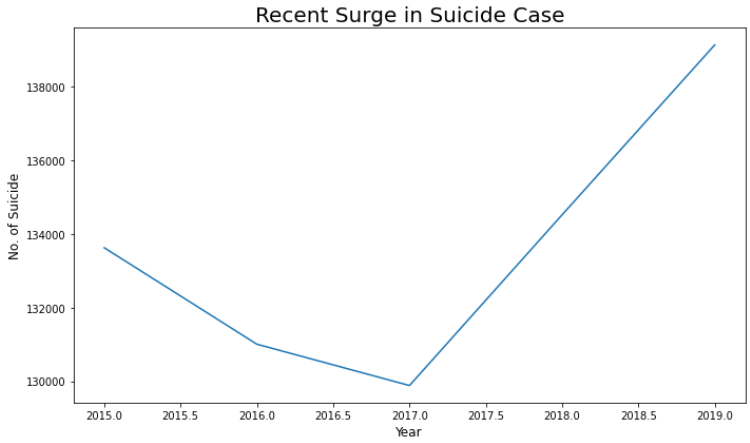


Fig. 1 Surge in SR as per NCRB

India is one of the most populated country in the world and has an HDI rank at 130. It is a tool that measures our country overall development and achievements in multiple dimensions such as economic and social development WHO ranked the Indian suicide rate for women to be 6 and for men is 22.

According to NCRB data, there have been 1,39,123 suicides which have been reported in 2019 with an increase of 3.4% compared to 2018 and with a surge of 0.2% during 2019. This is an issue that needs to be addressed with the increase in the alarming rate

2. LITERATURE REVIEW

As we are looking closely into the causes and nature of the reported suicide cases in India, there has been some research on the topic pertaining to the country India. The limited resources for certain services can often degrade the mental state of an individual. It can be observed in most of the middle and low-income communities. The cause for an increase in suicide rates as per the study can be personal or social reasons as per the NCRB data.

Differences between countries in suicidal ideation may reflect differences in social and economic factors, like in the west the availability of lethal means, and the gun law, rather than differences in morality. Common methods used in developed countries include guns, inhaling car exhaust, and poisoning while in developing countries, pesticide poisoning, hanging and suicide lead the list.

As far studies indicate that the use of pesticides, such as agricultural pesticides readily available in rural areas, is a common form of suicide and suicide attempts in India and areas with low income and facilities. .

Such data collected and analyzed are from a secondary source like NCRB which depends on the cases that are reported by the community. Since attempted suicide is a punishable offense in India, it is often unreported for the same. Even after the under-reporting of such cases, NCRB gives an important insight into directing a plan for further prevention. It is often seen that spirituality is able to make one understand their purpose and work on their self-growth and cope up with difficult times which is to be explored using the data present with us.In that context, we are bound to explore certain factors that might affect the rate of suicide cases throughout certain demography like Age, Education, Profession, and Religion.

3. RESEARCH METHODOLOGY

The methodology for this study is basically analyzing the trends in factors that affect the suicide rates

Firstly we come up with some factors which might be closely related to or impact the suicide rates in the country. In our case Age, Education, Gender, Profession, and Religion are those factors. After analysing the data for the above factors with the suicide rates if there's any trend that it follows, then we considered it as an important factor for further analysis and suggest preventive measures that counteract the pattern that follows. So basically we use two approaches for our paper ie Analytical Approach and Suggestive Approach.

1) **Analytical Approach:** This approach utilized the data from government sources to understand the pattern that follows for certain factors like Marital status, age, and gender.
2) **Suggestive Approach:** By identifying the pattern in the data we will suggest preventive measures that can be a ground for further analytical research as to whether the suggested approach makes a difference in the current box of preventive measures for the current surge of suicide cases in India.

- Dataset was cleaned and analyzed using Python open-source libraries. Dataset has been gathered from Gov.in site and Kaggle.
- And according to the trend of certain factors, we would propose a prevention model which might reduce the number of suicide rates not just in a particular state but for the purpose of getting better results in all other places as well.

4. DATA ANALYSIS AND RESULTS

As per the analysis in fig 2, among other stats, Maharashtra is the second most populated state and has the most number of suicides in the entire country. With rates of suicide up to 12.4% and followed by Tamil Nadu which is 12.2%.

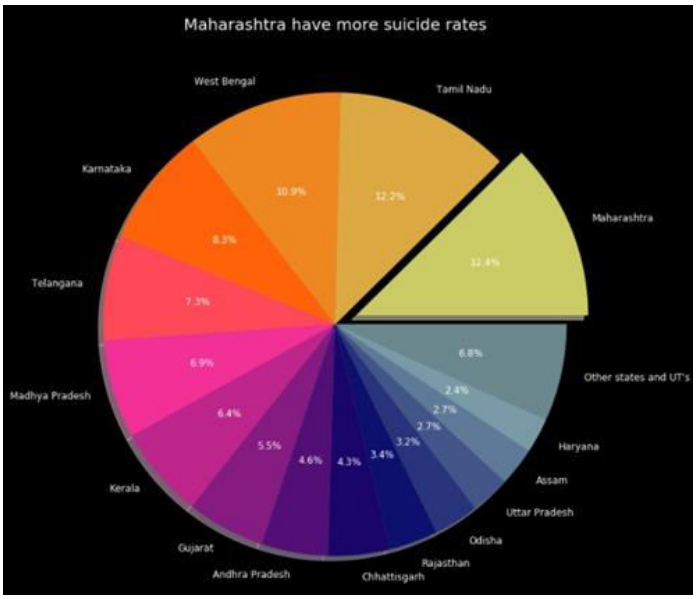


Fig. 2 - Pie chart on SR per state

Other states such as Nagaland have the least amount of suicide over a decade and Union Territory such as Lakshadweep also has a very less suicide rate.

A) Suicide Demographics for Gender

After analysing the data we can see which gender is more inclined toward suicide risk.

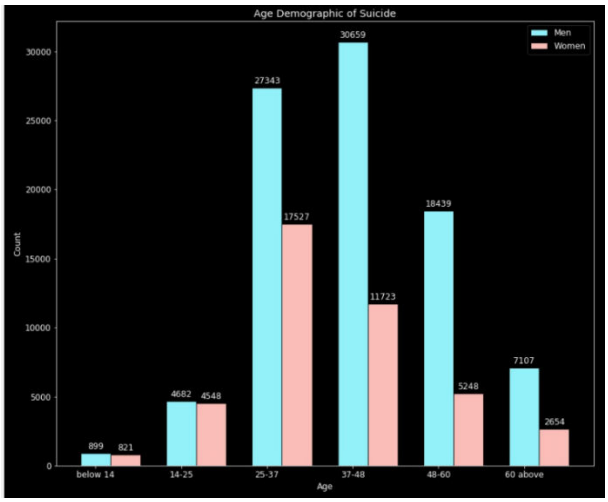


Fig. 3- Categorised Bar Plot as per Gender

As shown in fig 2 our study reveals that men are more prone to Suicide. Men between the age of 37-48 suicide more and women between the ages of 25-37. Children below the age of 14 are also suiciding this marks the question on parenting and schools. Our elderly that are supposed to provide wisdom to the modern generation are having suicidal thoughts.

a) Nature of Suicide most opted

It certainly seems the common way opted for suicide is by Hanging followed by poisoning which is 34254 in total. Many of such poisoning medicines are available at medical stores. The government may use certain conditions in the sale of these toxic drugs without a prescription. This also applies to sleeping pills. Doctors should check their patients regularly to get a prescription and make sure the person is taking the right dose.

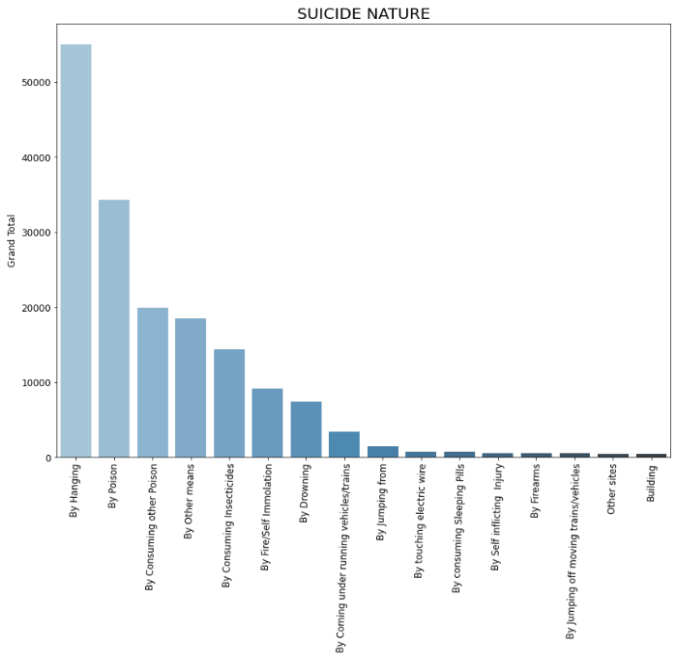


Fig. 4 – Nature of Suicide

b) Suicide cause and Nature of Suicide

As we detect in fig. 5 the causes of suicide with the data available with the NCRB it is evident that the mostly shows that family problems being the primary cause.

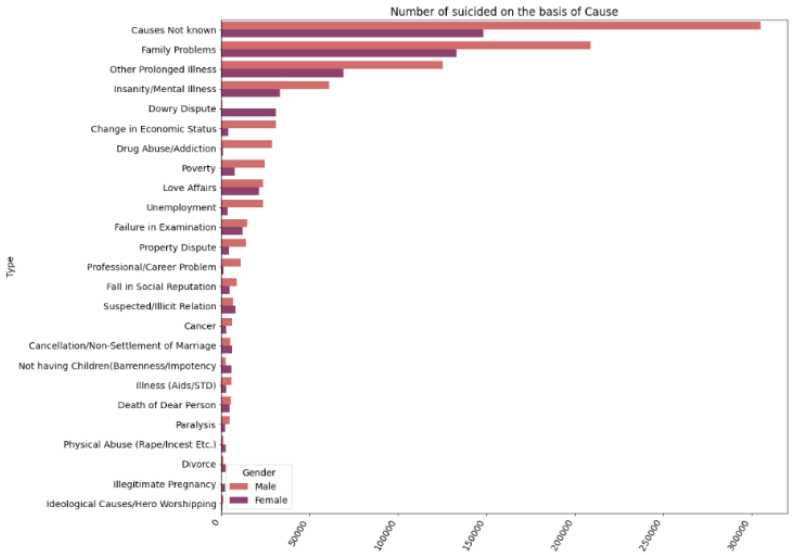


Fig. 5 - Horizontal Bar plot of Cause of Suicide

It is natural that in a community-based country like India family problem arises which as we can see had become the leading cause of an increase in suicide rates. The dispute is caused by accepting or demanding a dowry. These problems are caused by social pressure. Changes in the economic status of the person have more impact on men. Failure in examination also leads to suicidal thoughts. In particular, students fall due to failing exams due to social pressure and low self-esteem.

The cause of the ideas or worship of the Hero is an important factor that we must consider. Celebrities and other people like influencers have a hand in changing the mind set of young people, the media are showing this in the news, and the people who follow them feel depressed and try to do it. This should be taken into account when broadcasting suicide stories

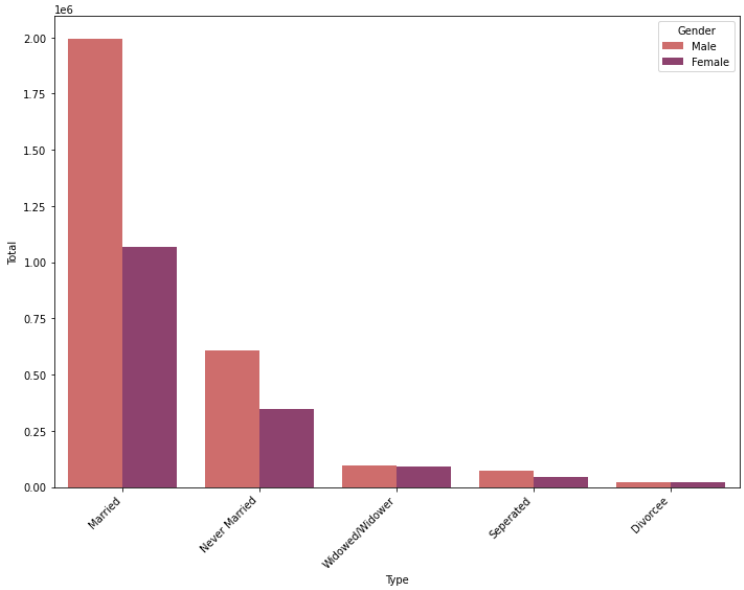


Fig. 6- Categorised Marital Status in terms of Gender

c) **Marital Status of Person During Suicide**

Suicide not only affects the person suiciding but also their family. Family also plays an important role in a person's mental health.

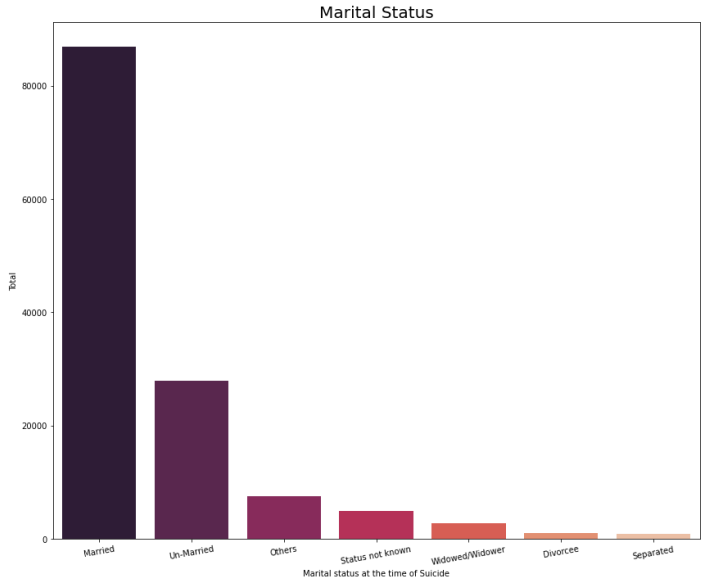


Fig. 7- Bar plot of Marital Status of person

In fig. 7 data shows that married people are more inclined toward suicide. This can be due to economic problems or family pressure on the person.

Married women are also having a great suicide risk. This is mostly due to domestic violence and family disputes.

d) **Profession of Person During Suicide**

Profession for person give him/her identity. Profession is also a way to earn money.

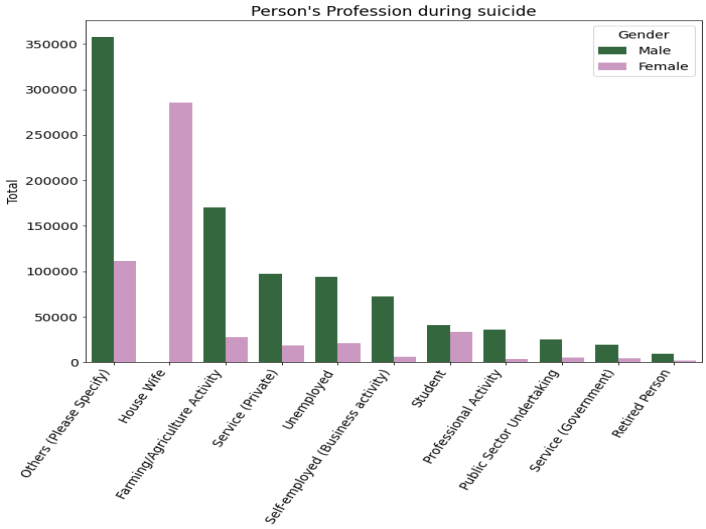


Fig. 8 - Group Bar Plot of Profession of suicide person

As we can see in fig. 8 housewives are more likely to suicide. In our data analysis, I found out that Women with good education and profession are less prone to suicide and our government work is effective.

Agriculture is the primary sector of India. It is important to protect their rights as the Indian economy is mostly dominated by Agriculture and Farmers. Farmer's suicide is a huge impact on our society. Also, people working in the Private sector are more inclined toward suicide than people working in Government Sector.

e) Suicide of Indian Farmers

In our data analysis, we saw that professional farming causes most suicide in India. So we set out to check the number of suicide cases caused due to farming failures.

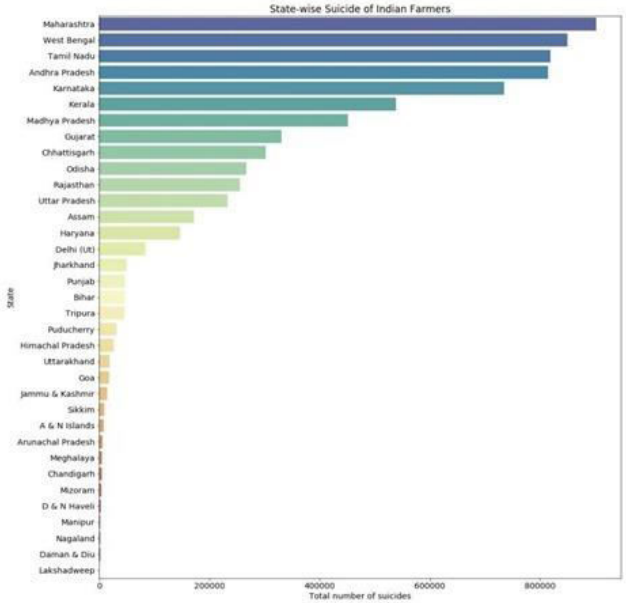


Fig. 9 - Horizontal Bar Plot of Suicide of Farmer wrt States

Maharashtra has the highest number of farmer suicides**.** Farmers from southern and central states suffer the most. These are due to different causes such as –

i. High Monsoon Rate

ii. Water depletion

iii. Ancient farming techniques

iv. Improper water management

v. Other factors such as financial instability

According to the data provided by NCRB, a total of 10,281 victims were in the agricultural sector (including 5,957 farmers/farmers and 4,324 agricultural workers) who committed suicide in 2019, which is 7.4% of total suicide in the country.

f) Suicide due to Drug and Alcohol Addiction

Alcohol and drugs have a great impact on a person's mind and can lead to suicidal thoughts.

As per our analysis shown in fig. 10, Maharashtra has most amount of suicide due to drug and alcohol consumption than any other states. Maharashtra is about 60% ahead of all the states in suicide with drug and alcohol consumption.

The government of Maharashtra needs to address these issues. Alcohol and drug consumption should be monitored by the Government and other bodies.

Treatment for alcohol and drug consumption is to go to support groups, self-care, and counselling.

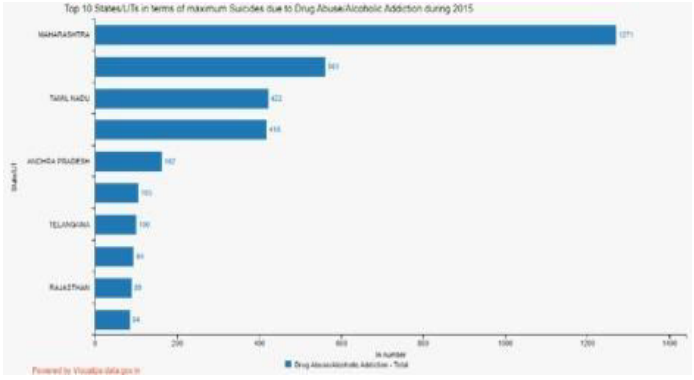


Fig 10 - State wise Suicide due to Alcohol and Drug consumption

g) **Education of Person During Suicide**

As we all know educations play a very important role in the mind-set of the person. Education changes the way a person thinks.

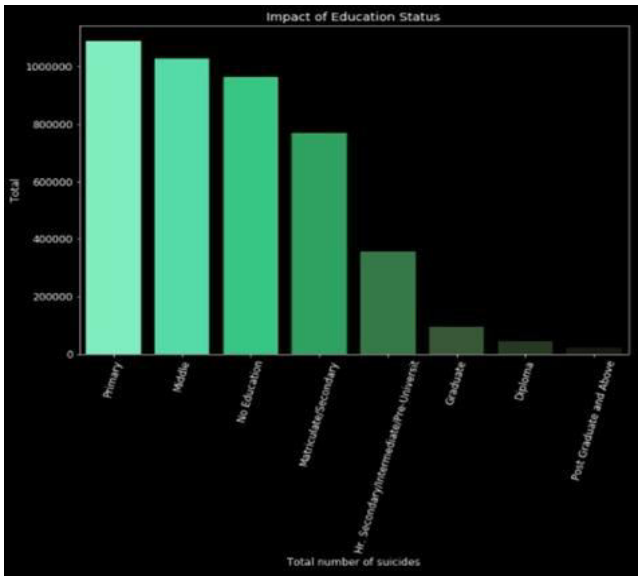


Fig. 11 - Bar plot of Education Impact on Suicide

As shown in fig. 11 our analysis reveals that the impact of education on people's mind-sets is exceptional; people with more than 15 years of education are less likely to suicide. People with no education are more likely to suicide. People with a minimum level of education seem to be more prone to suicidal thoughts due to their inability to contribute to society or lack of understanding of self-worth.

h) Religion and Suicide

It comes to a surprise that religion plays a major role in understanding the impact on the suicide rates.

Certain values and goals have been to be a powerful addition to happiness in life. The results of current research convey that spirituality can be used as a powerful mediator for goal orientation and focus on various values in life.

There are also other variables that religion provides like, religious establishment (Temple, Church, Mosque, etc.) provide a support system and sense of community which could help in tackling loneliness and antisocial behaviour. Also, many religions have strict rules for drugs and alcohol

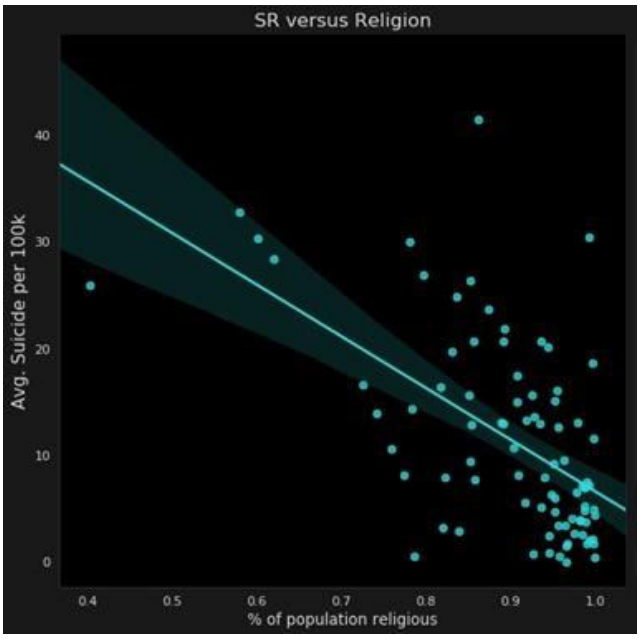


Fig. 12 - Scatter line plot

As we can look from fig. 12 plot, countries with more religiousness are less prone to suicide than a country with atheism.

1. PREVENTION APPROACH

On further research on the preventive approach that we are proposing, we might be able to get a piece of conclusive evidence on whether we can move forward to implement those measures in place.

There is clear evidence of an increase in suicide cases in the metropolitan cities in the country which might be because of the continuous stress, unemployment, and unequal pay. We can bring change by strengthening support for economic policies regarding Housing stabilization by the government.

Marital status, Family problems is also evident in contributing to the increase in the suicide case.

By availing of therapy at affordable rates we can open door to potential victims and understand the underlying reason for most households which might be financial instability, relationship problems, abuse, etc.

With an increase in failure in of farming industry, it has created a sense of financial instability and debt among the farmers. Government should certainly provide better loan waivers, seeds, or fertilizers subsidiary, teaching them better farming techniques, desalinized water, water management, etc. Strengthen access and delivery of suicide care.

Drug addiction itself degrades the mental ability to function normally. So it is significant to detect early and seek help in several ways, people who are dependent on substances often get depressed, with also social and financial problems. It is necessary to have Community based policies that might reduce the excessive drug addiction and substance use in certain areas. And to provide psychiatric and rehabilitation facilities for proper recovery in an engaging surrounding.

One of the surprising discoveries is how religion or spiritual practice has affected the number of suicide cases. Since they are using spirituality or religion, it gives them comfort and it seems to

be a coping strategy in difficult times. The community in itself provides a strong sense of security during social needs. Since Spirituality gives faith and positive feelings of hope it is important to introduce core values of spiritual journey and introduce yoga and meditation in psychiatric centres.

Since the analysis shows a clear picture of the cause it is necessary to create a protective environment by reducing access to lethal means among persons at risk of suicide.

1. CONCLUSION

After all of the data wrangling and data analysis, we conclude that the suicide rate in India is increasing and the youth of India is getting the most of it.

While Maharashtra and Tamil Nadu are having the most suicide other Union Territories such as Puducherry have more suicides per area km.

Looking at the gender demographics of suicide Men between the ages of 37-48 are more likely to suicide than women between the ages of 25-37.

Education has a great impact on the suicide rate. The more the person is educated less likely the person have suicidal ideations.

In the end person's mental well-being is the utmost variable that comes to account for suicide risk. Many Government agencies and NGOs are working toward suicide risk. Aasra is a great example of an organization that helps people by using public charity. Aasra is available in Mumbai and 24*7 available.

2. REFERENCES

[1] Hegerl U, Wittenburg L, Arensman E, et al. Optimizing suicide prevention programs and their implementation in Europe (OSPI Europe): an evidence-based multi-level approach. BMC Public Health. 2009 Nov;9:428. DOI: 10.1186/1471-2458-9-428. PMID: 19930638; PMCID: PMC2787518.

[2] Radhakrishnan R, Andrade C. Suicide: An Indian perspective. Indian J Psychiatry. 2012;54(4):304-319. doi:10.4103/0019-5545.104793

[3] Wagani, Rekha, and Erminia Colucci. "Spirituality and wellbeing in the context of a study on suicide prevention in North India." Religions 9.6 (2018): 183.

[4] Sudarshan S, Mehrotra S. Suicide Prevention Mobile Apps for Indian Users: An Overview. *Cureus*. 2021;13(7):e16770. Published 2021 Jul 31. doi:10.7759/cureus.16770

[5] Snowdon J. Indian suicide data: What do they mean?. *Indian J Med Res*. 2019;150(4):315-320. doi:10.4103/ijmr.IJMR_1367_19

[6] Teja, K & Pravalika, S & Varshitha, G & Basha, Muzamil & Iyenger, N Ch Sriman Narayana & Caytiles, Ronnie. (2018). Data Exploration on Overall Suicides Cases Registered Across India. International Journal of u- and e- Service, Science and Technology. 11. 10.14257/ijunesst.2018.11.2.02.

[7] Syed, Sobia & Amin, Imran. (2017). Prediction of Suicide Causes in India using Machine Learning. Journal of Independent Studies and Research - Computing. 15. 10.31645/jisrc/(2017).15.2.01.

[8] E, du & François, Beck. (2013). Efficient interventions on suicide prevention: A literature review. Revue d Épidémiologie et de Santé Publique. 61. 10.1016/j.respe.2013.01.099.

[9] Rakhi Dandona, Amelia Bertozzi-Villa, G Anil Kumar, Lalit Dandona, Lessons from a decade of suicide surveillance in India: who, why and how?, *International Journal of Epidemiology*, Volume 46, Issue 3, June 2017, Pages 983–993

[10] Cheng, Andrew TA, et al. "Psychosocial and psychiatric risk factors for suicide: Case-control psychological autopsy study." *The British Journal of Psychiatry* 177.4 (2000): 360-365.

SECOND LIFE: METAVERSE

Trishna Tamanna Biswal, Prof. Nidhi
BVIMIT, Navi Mumbai

ABSTRACT
The Metaverse is the post-reality universe, a everlasting and persistent multiuser environment merging physical reality with digital virtuality. It is based on the interchange of technologies that enable multisensory interactions with virtual environments, digital objects and people such as virtual reality and augmented reality.

Keywords: Artificial Intelligence, Blockchain, Digital World, NFT's, Metaverse , Virtual Reality, Cryptocurrency

1. INTRODUCTION
Metaverse is a technology that makes the user to interact with a virtual world[Fig 1] just the way it happens in real world like you can explore the world, you can work and transact, you can talk to people, you can play and eat, etc. Such are the similarities between a real world and the virtual world[Fig 3]. It can be achieved with the help of Virtual Reality, Augmented Reality technologies, etc. Which makes the user fully immersed into the virtual world. Metaverse has definitely changed the level of technology by taking the following into consideration that is; virtual identity, virtual currency, virtual ownership, virtual assets which makes the possibility of a fully functioning economy in the virtual world.[1] A very amazing technology that has also helped in the covid19 pandemic like you can go to the concert, you can discover art exhibitions, you can visit new places and monuments, etc. This way you will be able to see the things and feel a different world in front of you. There are a few examples of metaverse utilized by a few businesses which include Facebook which has launched "Meta Horizon Worlds" wherein the assembly is performed in a digital surroundings that may be accessed handiest with the aid of using the organization with the assist of VR headsets and Horizon Worlds [1]. It allows the interaction between the peers in a virtual environment with your own avatar created[Fig 1]. Roblox started as a game and now is trying to create their own metaverse by teaming up with the fashion brands like Gucci and Vans where you will be able to buy clothes for your virtual self. Minecraft, a lego game world which is played almost by everyone where you can create your own identity, virtual worlds, assets and many more.

Fig 1: Metaverse

3. LITERATURE SURVEY
The Metaverse is described as a virtual fact that mixes factors of social media, games, augmented fact, digital fact, and cryptocurrencies that permit customers to engage virtually[2]. This paper offers a concept of ways Metaverse emerged as Second Life with the assist of

technology. It essentially approach having real-world-like trends inclusive of strolling down the street, speak to people, working, playing, doing business, going to concerts, and so on. The Metaverse is absolutely the following evolution in technology.

Below will be the foundations for enabling metaverse–

2.1. It Infrastructure -

Metaverse is created through using generation that wishes to art work with admire to showing the virtual three-D global in which you may control each element and revel in the sensation of being in it. Such era are however needed to way huge portions of data, create and manipulate 3D virtualizations and beautify character interactions. The IT infrastructure wishes to be proper and powerful that consists of specialized virtualization hardware structures with GPU, CPU and TPU, great community generation the usage of 5G networks and furthermore Cloud Computing offerings for the garage of data's over the net. Such have been server-facet technology whereas, the consumer-facet have to consist of clever glasses, gloves, suites, and so forth or even cellular gadgets with higher processing powers.

2.2. Tools and Standards –

For the better interaction with metaverse, you need to have computer languages, easy to use design tools, VR/AR/XR standards, security standards, transfer protocols, technology standards like geospatial mapping.

2.3. Payment And Transactions –

An important consideration in metaverse is to make it a functioning ecosystem and therefore, there needs to be a universal mode of payment and transactions like Nft's, cryptocurrencies, etc.

2.4. Rules And Regulations –

A virtual world needs to have some rules and regulations just like we have in the real world in order to protect and keep our users safe which is why we need global rules and laws in the virtual world.

Identity Management and Avatars –

In a real digital world, we want to confirm the actual identification in order to stabilize ourselves by our own means.

Digital Working Ecosystem –

For doing anything in the virtual world, we need to have a functioning digital environment where we can travel, attend virtual fairs and exhibitions, attend lectures, play sports, watch movies, do shopping, work in a virtual company, etc., just like the real earth[Fig 2].

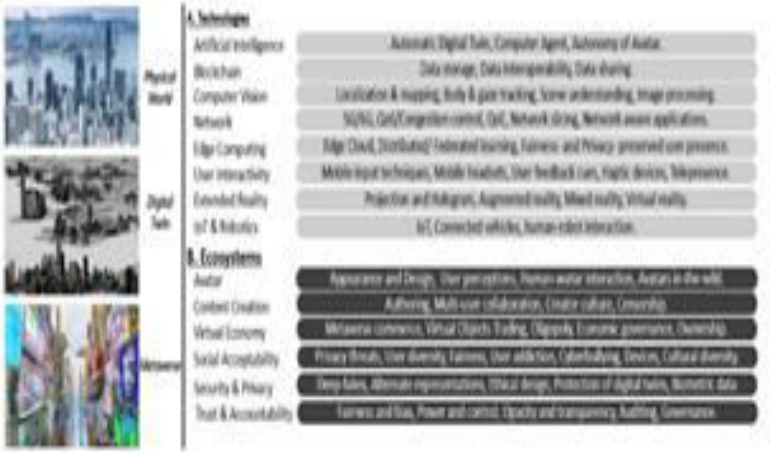


Fig 2: Connecting the digital world with its digital twins

2.5. Artificial Intelligence –

In metaverse, AI can be applied with NPC's (Non playing characters) in different scenarios. It's in almost many games and is designed to respond and react to the user's actions. With respect to AI's Processing abilities, NPC's can be placed across the 3D spaces to facilitate lifelike conversations with users or players and perform tasks. It is also used for creating avatars, facial expressions, clothes, and enhance the digital humans too.

2.6. 3D Modelling –

For metaverse to become a truly immersive platform, it will need a three-dimensional environment. There are some hundreds of 3D modelling tools which will be a foundation for companies looking to create a Metaverse or any VR-related product or service and apart from building objects from scratch in programs like Blender, it has now become possible to reconstruct objects in 3D with sensors[3]. In some cases, this can be fulfilled by mobile devices like iPhone which has got an infrared depth scanner called LIDAR sensor that can help in digitizing objects for use in virtual environments.

2.7. Blockchain & Cryptocurrency –

Blockchain is a kind of technology which will provide a decentralized and transparent solution for digital proof of ownership, transfer of value, governance, accessibility, and interoperability whereas, cryptocurrencies[2] will enable users to transfer value while they work and socialize in the 3D digital world and for example, cryptocurrencies can be used to purchase virtual lands in the form of non-fungible tokens (NFTs) and with the support of blockchain technology, the ownership of these virtual lands can be established and secured and in the near future, cryptocurrencies[2] can potentially incentivize people to actually work in the metaverse[Fig 2]. As more companies are taking their offices online for remote working, we might see metaverse-related jobs being offered.

2.8. Brain-Computer Interfaces –

Brain-computer interfaces will allow us to control avatars, various objects and digital transactions with our brain signals.[8] This technology is expecting to gain an initial foothold in the video game and workforce productivity markets. This technology will however, by the mid-2030s, get connected to the neocortex by some researchers.[8] The neocortex is basically a part of the human brain's cerebral cortex, where higher cognitive functioning is originated and there are some companies like Neurolink, NextMind and Neurable that are already developing this technology called brain-computer interfaces.

3. TECHNOLOGIES USED

3.1. Reality & Augmented Reality –

Both VR & AR can give us an access to digital worlds. They provide us with immersive and engaging 3D experiences. Both are different in terms of how they work. The difference is that AR uses some digital visual elements and characters to transform the real world.[3] It can be used on almost any smartphone. With the help of AR applications, users can view their surroundings and interactive digital visuals just like in some mobile games.

Whereas, VR creates completely a computer generated digital environment and users can experience it using VR headsets, gloves and sensors.

Both will expand the metaverse experience and soon the users will be able to interact, feel and hear others from different world.

3.2. Internet Connectivity –

Some companies are trying to overcome the difficulties of delivering a real-time, immersive virtual world.

Firstly, we will talk about 5G and 6G technologies because Metaverse will require extremely high internet speeds, high bandwidth, and low latency,[14] specially when the user will enter a big virtual world with highly detailed textures and unbelievably high polygon counts.[15] 5g technology enables extremely high frequencies at the millimetre wave spectrum, which opens up possibilities like VR experiences that include the sense of touch and AR experiences that let visitors have in-depth conversations with AI characters in real-time. However, 6G be will replacing 5G and some countries have already launched research initiatives.

Metaverse and NFT's –

NFT's also called as Non-Fungible tokens which came into existence in the year 2014 is basically a digital asset that represents real-world objects like music, art, videos and in-game items. They are bought and sold online, frequently with cryptocurrency, and they are generally encoded with the same underlying software as many cryptos. These tokens are 100% unique just like some certificate of ownership that exist on the blockchain. They are created when a digital file (like an image, video or GIF) is minted. This actually means that a certificate of ownership and originality is generated via cryptocurrency (usually Ethereum) and NFTs are very important in the Metaverse for creating an exclusive environment and enhancing the digital community and social experience. sold/granted to the new owner.

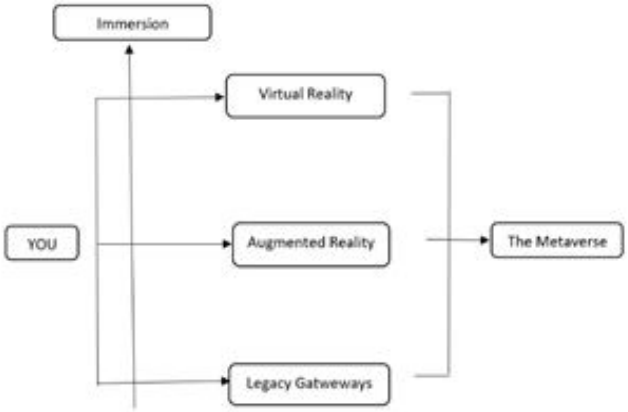


Fig 3: Flow of Metaverse

4. METAVERSE AND NFT'S

NFT's also called as Non-Fungible tokens which came into existence in the year 2014 is basically a digital asset that represents real-world objects like music, art, videos and in-game items. They are bought and sold online, frequently with cryptocurrency, and they are generally encoded with the same underlying software as many cryptos. These tokens are 100% unique just like some certificate of ownership that exist on the blockchain.[16] They are created when a digital file (like an image, video or GIF) is minted. This actually means that a certificate of ownership and originality is generated via cryptocurrency (usually Ethereum) and sold/granted to the new owner.

NFTs are generally useful because digital art and assets are mostly vulnerable for being easy to steal and copy. But NFTs cannot stop somebody from stealing digital assets so, they provide a unbiased and neutral confirmation of the designated owner. If we ever see NFTs integrated into copyright law, they may also serve as evidence against the misuse of digital goods. Users can have complete control over their digital assets in the Metaverse with the help of NFTs. NFTs are very important in the Metaverse for creating an exclusive environment and enhancing the digital community and social experience. Premium NFTs are used to gain access to the digital world's wealthiest and most affluent communities, as well as exclusive perks, staking rewards, and other high-end collectibles. The CryptoPunks collections, for example, grant select users

access to premium communities with password-protected content and even offline parties [Fig 4].

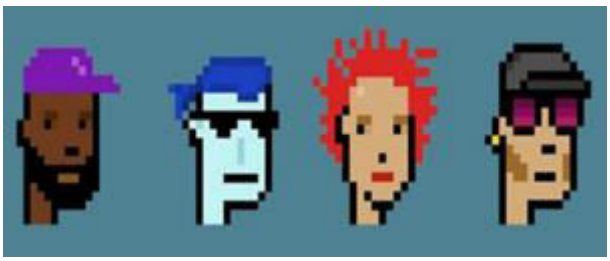


Fig 4: Cryptopunks

5. CRITICISMS AND CONCERNS

The metaverse has got several severe problems that needs to be solved in order to become a safe place.

Some examples of concern are Privacy, using of data, mental health concerns and also real-world social implications and imagine if someone has a better life online than in real life, why would that person want to live in the real world, date in real world, have children, get a real-life job, etc and another issue is about the privilege and power it could give a single person. This means that literally one person could have the power to create a virtual world with his or her own laws, with an own economic ecosystem, with own identities and evading real world rules and governance. [7] User addiction and problematic social media use is another concern.

6. CONCLUSION

After reviewing some of the information provided, we can conclude that Metaverse will be the most loved version on the internet today.Metaverse is a virtual world that would help people to achieve jobs who cannot physically be present. Metaverse promises an immersive environment with unlimited limits on what we can do and the experiences we create[Fig 3]. To fully develop the Metaverse, key players in virtual reality space need to work together to achieve common standards and protocols for building virtual worlds.

6. FUTURE SCOPE

The metaverse technology is definitely a next logical step from the internet. Those early days, when you could just read the existing information to the world of social media and creators economy and now in the age of virtual world into our own world has been really a great change so far.[5] Also, the direction of internet and information age is clear, we are definitely going to see the virtual worlds coming up where many users will experience or dive into it. We, in the society have still got many concerns to solve as social interaction, virtual economy and the illusion of complete virtual worlds will have lots of implication on our physical daily life. Metaverse development is still in its infancy but with acceleration in its development and billions being invested into it and also due to the covid pandemic, it will soon be a big part of our life. Even the people working on it like Mark Zuckerberg and Bill Gates have predicted that all our work, meetings and events will be done in the metaverse instead of physical world. We will definitely see how metaverse is going to take masses and position itself to create the much needed network effect as in the next five years, we will see metaverse becoming more real, sampleable and concrete. The amount of craze for this technology is increasing day by day with hardware prices getting affordable in the market[7]. Therefore, as demand is increasing, the need for innovation is getting higher.[12] Mark Zuckerberg's meta has decided to build a new AI supercomputer which will have the ability to bring the metaverse into reality.

The AI research super cluster or the RSC will help meta's AI researchers to build better models that will enhance their ability to make augmented reality tools and many more. Ultimately, the help from RSC will pave the way for building technologies like Metaverse where AI driven-applications and products will play an important role.[11] However, with the speed at which technologies are being developed and many companies are executing their innovating ideas with respect to immersive reality shows us that it is only a matter of time before metaverse becomes a reality.

REFERENCES

[1] William Burns III. Everything you know about the metaverse is wrong?, Mar 2018.

[2] Aaron Bush. Into the void: Where crypto meets the metaverse, Jan 2021.

[3] Diego Martinez Plasencia. One step beyond virtual reality: connecting past and future developments. XRDS: Crossroads, The ACM Magazine for Students, November 2015.

[4] William Burns III. Everything you know about the metaverse is wrong?, Mar 2018.

[5] Aaron Bush. Into the void: Where crypto meets the metaverse, Jan 2021.

[6] Diego Martinez Plasencia. One step beyond virtual reality: connecting past and future developments. XRDS: Crossroads, The ACM Magazine for Students, November 2015.

[7] Slater, M.; Sanchez-Vives, M.V. Enhancing Our Lives with Immersive Virtual Reality. Front. Robot. AI 2016.

[8] Dionisio, J.D.N.; Burns, W.G., III; Gilbert, R. 3D Virtual worlds and the metaverse. ACM Comput. Surv. 2013.

[9] Lanier, J. Virtual reality: The promise of the future. Interact. Learn. Int. 1992.

[10] Bell, G. (2022). The metaverse is a new word for an old idea. MIT Technology Review, 8 February. https://www.technologyreview.com/2022/02/08/1044732/metaverse-history-snow-crash/.

[11] Collins, C. (2008). Looking to the Future: Higher Education in the Metaverse. *Educause Review, 43*(5).

[12] Krueger, M.W.; Gionfriddo, T.; Hinrichsen, K. Videoplace—An artificial reality. In Proceedings of the SIGCHI.

[13] F. V. Langen. Concept for a virtual learning factory. 2017.

[14] D. Schmalstieg and T. Hollerer. Augmented Reality - Principles and Practice. Addison-Wesley Professional, 2016.

[15] Kyle Chayka. Facebook wants us to live in the metaverse, Aug 2021.

A CONCEPTUAL STUDY ON VOICE BASED EMAILSYSTEM USING PYTHON

Sneha Ruke, Ankita Singh, Dr. Suhasini Vijaykumar and Prof. Gunjan Behl
BVIMIT, Navi Mumbai

ABSTRACT
Communication plays a vital role in human life. Today, in the world communication has become very easy with the evolution of many communication technologies using the internet. Using the internet to communicate E-mail is often regarded as the most secure method of delivering and receiving sensitive Information. This application is on voice- based email automation that will provide visually and physically challenged people to get access to Internet communication which they cannot get due to physical challenges. This email application will provide them voice Recognition mailing system in which email can be sent by speaking and received mail can listen to via audio by using python libraries which convert speech to text and text to speech conversion. This application also allows the user to read the attachments which can be in pdf or word form. So this system aims at developing an E-mail Application that will help the naïve visually impaired person & normal people to access the services easily and efficiently for communication without previous training & also allow users to read the received email via audio.

Keywords: E-mail, Internet, Communication, speech-to-text text-to-speech converter, speech recognition.

1. INTRODUCTION
We have seen that the introduction of Internet has revolutionized in many fields. Today the world is running on the basis of internet.[1] No work can be done without use of internet. Electronic mail i.e. email is the most important partin day to day life. Email is one of the most reliable, dependable, authentic, genuine, and frequently used modes of communication in the corporate world.[2] But some of the people in today's world don't know how to make use of internet, some are Physically or Visually impaired people or some are illiterate. So it's very difficult for them when to live in this world of the internet. In this research, the use of speech-to-text and text-to-speech techniques access for Physically or Visually impaired people. Also, this system can be used by any normal person , for example the one who is not able to read. The system is completely based on interactive voice response which will make it efficient. It'll help the visually impaired people to use an email system more effectively and efficiently by gibing the input by their voice.[8] This architecture will reduce cognitive load taken by blind people to remember and type characters using keyboard as all operations are going too enabled through speech. This system can be used effectively by handicapped and illiterate persons as it is based on TTS, STT CONVERSIONS.

2. LITERATURE REVIEW
While working on this project , we get to know that number ofapplication are there that had the same goal as us. some are listed below:

In August 2018 , Naveen S, Sumanth M, Sreenidhi K, Sreekanth P H, Ravi Kumar N MAILING SYSTEM BASEDON VOICE

They proposed a architecture which enables blind people to send and receive voice based email in their native or convenient languages with the help of previous existing mail server. [3]

In July 2021,AkshitaBhandari ,Aayushi Shukla , Darshita Khanna , Garima Verma , Poorva Shinde , Prof. Asif Ali VOICE BASED EMAIL SYSTEM USING PYTHON

They proposed a method for Physically or Visually impaired people who are unable to use the most common communication services that we use on a daily basis that is Email. This is due to the fact that their isn't any means for the person in front of the screen to hear the content. The existing system was available for the disable and able people to use the voice based emailing system through text-to-speech and speech-to-text conversion. Their approach prioritizes user friendliness for all types of people, including normal persons who are visually impaired and illiterate. IVR (interactive voice response) underpins the entire system. The entire system is dependent on voice prompts and mouse clicks [4]

However, the accessibility of the proposed system is for all types of whether able or disabled individuals. In previous research paper they didn't talk about the attachments that can be send via email automation that provides them to send email and received email with attachment to hear, via text to speech (audio in the voice either male or female) the attachments which are in pdf or word formats with the help of python libraries which make it more easier to do. In this research paper we going to talk about that, this will help visually or physically challenged person to make fully use of emailing in the real world.

3. OBJECTIVES

This aims at developing an email system that will help even a naïve, visually impaired person to use the services for communication without previous training. The system does not require the use of keyboard. Instead it will work only on speech conversion to text and text conversion to speech. It can help to increase productivity in many businesses, such as in healthcare industries. It can capture speech much faster than typing. You can use text-to-speech in real-time. The software can spell the same ability as any other writing tool. Helps those who have problems with speech or sight.

4. METHODOLOGY

The Internet is a vast network that connects computers all over the world. Through the Internet, people can share information and communicate from anywhere with an Internet connection. But internet is entirely worthless for the visually challenged and illiterate.[5] The proposed system will be via email to be available for people with poor eyesight and helping the community.[9] This System aims at developing an email system that will help even a naïve, visually impaired person to use the services for communication. The software can spell the same ability as any other writing tool and Helps those who have problems with speech or sight. In this system mainly three types of technologies are used.[6,7]

4.1 Speech-to-Text(STT)

Here whatever we speak is converted to text. Microphone is used by the system to obtain the speech at run time. Here we use speech to text system which directly obtains and converts speech to text with the help of python libraries.

4.2 Text- to-Speech(TTS)

This method is full opposite of STT. In this method, this converts the text format of the emails to synthesized speech with the help of python libraries pyttsx3.

4.3 Speech Recognition

Speech recognition is the ability of a machine or program to identify words and phrases in spoken language and convert them to a machine-readable format. You can then use speech recognition in Python to convert the spoken words into text, make a query or give a reply.

5. FLOWCHART

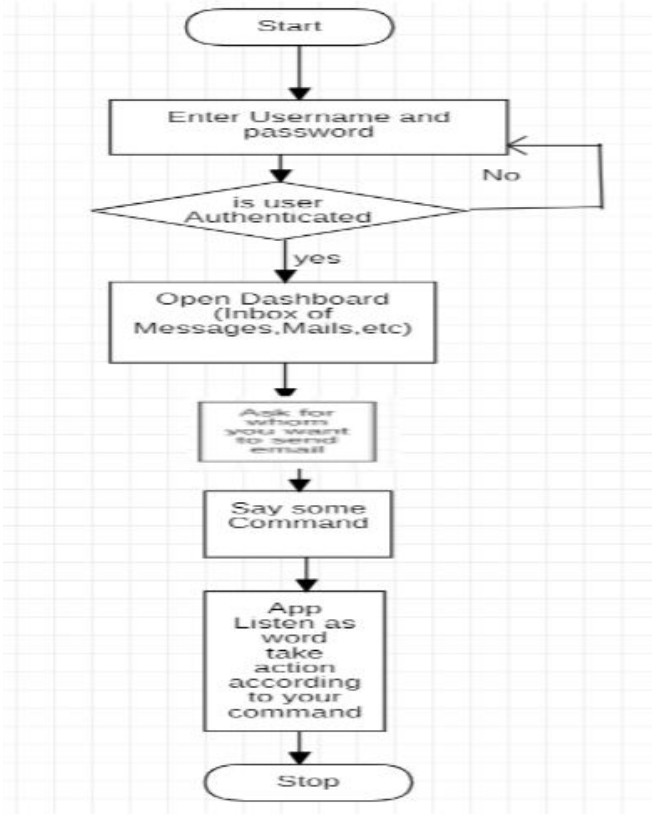


Figure 1: Flow chart of User login and system

In this system, the user can login by speaking username and password when prompted by the system, after verifying the credentials the system will take the user to the menu page which contains Compose, Inbox, Send, Trash, and Logout. According to the users choice operations will be performed.

6. ALGORITHM

Firstly it recognizes the speech for that python has speech recognition library which will help in recognizing speech to text after that it convert text to speech using another library provided by python only pyyttsx3.

For attachments like pdf and word

For pdf we use PyPDF2 which Extract the text from the pdf file page by page using the PyPDF2 ->Text-to-Speech Engine.

First, I take the PDF file and convert each page into text using PyPDF2 library.

Then it takes the text(s) and scan the text in the pdf using PyPDF2 OCR (Optical Character Recognition) library.

Then we use Text to Speech library offline to convert text to audio file using Pyttsx3.

You can tune the speed and volume of speech, and change the voice-over from male to female and vice-versa, depending on your requirements.

Lastly we will change the rate of speed by use getProperty('rate') to get the current speaking rate. Change the rate of speaking using setProperty('rate', x), where x=100 being normal speed (1x).

For Word we use python-docx2txt library to read text from Microsoft Word documents. It is an improvement over python-docx library as it can, in addition, extract text from links, headers and footers. It can even extract images.

7. IMPLEMENTATION

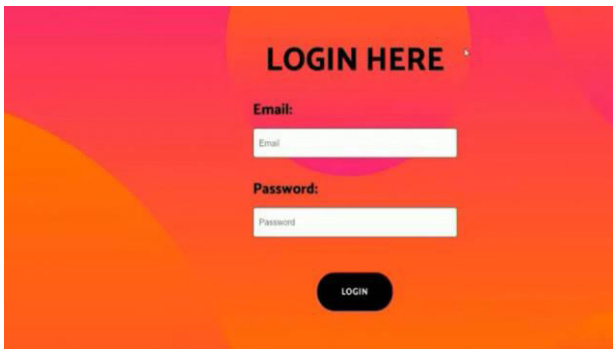


Figure 2: User login

Login module will ask user to provide username and password the details are correct then the user is authorized and will enter to the menu page.

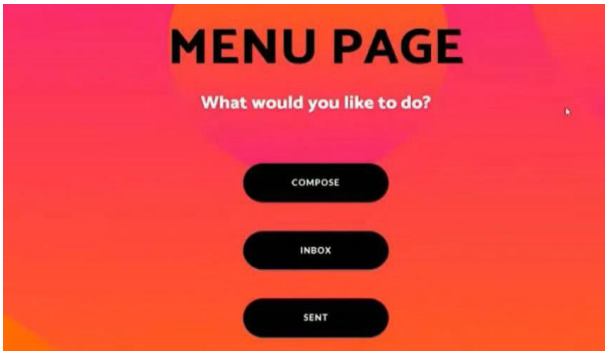


Figure 3: Menu page of the system

After successfully login. User will redirected to menu page which content operations like Compose mail, Inbox, Sent, Trash, Logout.

Figure 4: Compose mail of the system

In this Compose mail page it will ask for recipients email id, subject of the email and body of the email.

8. FUTURE SCOPE

This model can be improved by using database and more advanced feature by adding to it which will ease the usability of this system which help the Physically or Visually impaired people or normal people.

9. CONCLUSION

We have planned a system which can facilitate the visually impaired individuals to access email services efficiently. This application can be used easily by a visually impaired person to access emails related services. Thus dependency of visually impaired persons on other people for their activities related to mail can be reduced. This system can help in overcoming some drawbacks that were earlier faced by the blind individuals in accessing emails. The user solely has to follow the directions given by the system and use voice commands consequently to get the several services offered. Other than this the user may have to be requested to feed info through voice inputs whenever required. Our application will help physically challenged people to access the world according to their ability.

10. REFERENCES

[1] Voice based E-Mail System PranjalIngle, HarshadaKanade, Arti Lanke, Prof. Manasi Choche. .

[2] Voice based e-mail System for Blinds Pranjal Ingle1 ,Harshada Kanade2 , Arti Lanke3

[3] Mailing System Based on Voice Naveen S, Sumanth M, Sreenidhi K, Sreekanth P H, Ravi Kumar N Dept. of ISE,EPCET, Bengaluru, Sreenidhi776@gmail.com

[4] VOICE BASED EMAIL SYSTEM USING PYTHON Akshita Bhandari1 ,Aayushi Shukla2 , Darshita Khanna3 , Garima Verma4 , Poorva Shinde5 , Prof. Asif Ali6 1,2,3,4,5 Student, Department of Information Technology.

[5] Voice Based Email System for People with Visual Impairment Rahul Kumar* 1 ,Vaishali Singh2 , Dr.Nikhat Akhtar3 , MrsVersha Verma4 , ShivamSrivastava5

[6] V-Mail (Voice Based E-Mail Application): Review Asst. Prof. Naziya Pathan, Nikita Bhoyar, UshmaLakra,DileshwariLilhare

[7] Voice Based E-Mail System using Artficial Intelligence Rijwan Khan, Pawan Kumar Sharma, Sumit Raj, Sushil Kr. Verma, Sparsh Katiyar

[8] Voice mail application for visually impaired persons Taslima Binte Hossaina *, Yeasmin Ara Akterb , Md. Ataur Rahmanc

[9] Voice-Based Email System 1Harivans Pratap Singh 1Aman Pratap Kushwaha, 1Aayushmaan, 1Harendra Singh Department of Computer Science and Engineering ABESEC, Ghaziabad, U.P, India

HEART DISEASE PREDICTION USING MACHINE LEARNING

Mansi Rajendra Gade and Rasika Patil
BVIMIT, Navi Mumbai

ABSTRACT
Healthcare field features has immense quantity of information, for process those information bound techniques are used. Data processing is one in every of the techniques typically used. Cardiovascular disease is the major reason behind death world-wide. This technique predicts the arising prospects of Heart- Disease. However, it remains tough for clinicians to predict heart disease because it could be a complicated and expensive task. Hence, we tend to projected a medical web for predicting cardiovascular disease to assist clinicians with diagnostic and build higher selections. The end result of this technique provides whether or not the user features a heart disease or doesn't have a cardiovascular disease. The datasets are classified in terms of medical parameters. The aim of this project is to predict heart disease using data processing techniques and machine learning algorithms. This project implements five classification models scikit-learn: Logistic Regression, Support Vector Classifier, k-Nearest Neighbors, Neural Network and Random Forest Model to analyze their performance on heart information sets obtained from the UCI information repository and from Kaggle.com. The framework that may be accustomed build the project is Django.

Keywords: Heart sickness, Cardiovascular disease, cardiac arrest, clinical Random Forest, machine learning

1. INTRODUCTION
According to the world health organization (WHO), cardiovascular diseases are unit the primary reason behind death worldwide, with over 17.90 million individuals died in 2016[1]. CVDs are unit a group of syndromes affecting blood vessels and heart; which include heart disease (HD), that is usually expressed as coronary cardiovascular disease [2]. However, cardiovascular disease is prevented by perceptive a healthy mode and avoiding risk factors. Thus, understanding what's conducive to those ugly factors might facilitate for the interference and prediction of HD. Typical, Angiography is that the primary diagnosing method; it used to confirm the localization of heart vessels' stenosis. Being expensive, long, and invasive had impelled researchers to develop automatic systems supported information gathered through a group of medical data, like data from past treatment outcomes in addition because the latest medical analysis results and databases [3]. Nowadays, machine learning techniques are used to assist clinicians in creating additional correct predictions of HD based on medical data , these data is demographic, symptom and examination, ECG, and laboratory. Many studies were carried on diagnosis and predicting heart disease using machine learning techniques [4]. Most researches have used the UCI heart disease data set due to its convenience [5]. This data set contains four sub data set and 76 to 80 class attributes; Generally, the studies that used several attributes have applied feature selection to improve relevance [6, 7]. Hence, most studies perform 14 attributes, as well as (Age, Gender, Chest pain, force per unit area ...) That are relevant for the chance factors of HD designation values [8-11]. Numerous prediction models were built using well-known machine learning techniques. The author [8] recommended a predictive model using C4.5 associate decision tree algorithms applied on the four collected and separated UCI data sets; this model achieved an accuracy of 76.06% and 75.48% for C4.5 and quick decision tree severally using only Cleveland data set. The author [7] Combined Infinite Latent feature selection method with SVM classifier and achieved an accuracy of 89.93% using three data sets, including Cleveland, Hungarian, and Switzerland, with 58 attributes. The author [6] predicted HD using the meta algorithm Adaboost on Cleveland data set and suggested

reducing the number of attributes from 76 to 28 to provide higher accuracy of 80.14%. The author [12] used Alizadeh Sani data set to develop a hybrid method by enhancing the performance of Neural network using Genetic algorithm and yielded an accuracy of 93%. A comparative study using four different classifiers including SVM, KNN, C5.0, and Neural network, was approved by the author [9], he achieved a high accuracy of 93.02% by C5.0 algorithm using 14 of attributes with different data sets. Despite a substantial research output, no gold-standard model is available to predict HD. This paper aims to build a clinical decision support system allowing predicting the risk level of HD using UCI Cleveland data set. A classification model is proposed to detect patterns in existing HD patient's data. In the next section, our methodology is described with a brief detail of the data set used. Section 3 presents the experiments and the different representations of outcomes.

2. LITERATURE REVIEW

Different research-based works have been done in the present years to find out the most preferable technique regarding heart disease prediction. In paper [13] the author has used classification algorithm Logistic Regression to build the model for Heart Disease Prediction. It is a simple prediction system. Authors have considered multiple major risk factors that are the cause of heart disease. The major risk factors are age, diabetes, hypertension, high cholesterol, tobacco smoking, alcohol intake, etc. In paper [14] the authors have used Naïve Bayes for the classification and AES(Advanced Encryption Standard) technique to provide security to user's data. The system continuously monitors the coronary heart patient and updates the data to the object converse data base and if any abnormalities are observed. In paper [15] The project involved analysis of the heart disease patient dataset with proper data processing. Then, three models were trained and tested with maximum scores Support Vector Classifier: 84.0 %, Neural Network: 83.5 %, Random Forest Classifier: 80.0 %. This project provides the deep vision into machine learning techniques for classification of heart diseases. In paper [16] authors have considered seven attributes such as Age, Sex, thal, Resting Bp, Cholesterol, Fasting Blood Sugar, Electrocardiographic which are extracted from a medical report to predict heart disease of the patient. The data mining technique used in this research paper is Naïve Bayes. In paper [17] the algorithms has been used the by authors to implement are Neural Networks (NN), KNN and SVM, to test the dataset which contains information of Algerian patients. In the end it was noticed that Neural Network gives the best results with 93% of accuracy. Paper [18] proposes a scalable system for heart disease monitoring using on Spark and Cassandra frameworks. This project is about applying real time classification for heart disease prediction system.

In [19]aim of the authors is to build an application of heart disease prediction system using robust Machine Learning algorithm which is Random Forest algorithm. A CSV file is given as input. After the successful completion of operation the result is predicted and displayed. Paper [20] uses five machine learning models namely Support Vector Machine, Random Forest, KNN, Gaussian Naive Bayes, Xg- Boost algorithms for predicting of heart disease. After performing all the classification techniques, accuracy of random forest is with 88.52% which is good and higher when compared to other models. In paper [21] authors have proposed a clinical support system for predicting heart disease to help clinicians with diagnostic and make better decisions. Machine learning algorithms such as Naive Bayes, K-Nearest Neighbour, Support Vector Machine, Random Forest, and Decision Tree are applied in this study for predicting Heart-Disease using risk factors data retrieved from medical files. The outcome reveals that Naive Bayes outperforms using both cross-validation and train-test split techniques with an accuracy of 82.17% and 84.28%, respectively. The second conclusion is that the accuracy of all algorithm decreases after applying the cross-validation technique. In paper [22] Principal Component Analysis, Hybrid Genetic Algorithm with k-Means two different kinds of data mining techniques are used for the early prediction of heart disease. The author's method reduces the dimensionality of the dataset using PCA and combined the unsupervised heuristic k-means

algorithm with metaheuristic Genetic Algorithms for better combinatorial optimization. After converging, the proposed algorithm has improved the final clustering quality. The outcome reveals that these data mining techniques can predict heart disease early with an accuracy of 94.06%.

3. RESEARCH GAP IDENTIFIED

3.1 Prediction of a Specific Heart-Disease type.

The current systems that are available do not predict the Heart Disease Type such as Heart Attack, Cardio Vascular Disease, Coronary artery disease, etc. For someone who is predicted to be suffering from heart disease.

3.2 Security for User's data.

From the above literature survey what I have understood is that are very few systems that care about user's privacy and provide security to the data.

3.3 Online doctor consultation with the nearest doctor available.

When it is predicted that someone is suffering from a heart disease by the system there is no facility for the user to book an appointment with a near by doctor or to consult the a doctor online.

4. PROPOSED METHODOLOGY

Heart disease refers to any condition affecting the heart. There are many types, some of which are preventable. Heart- Disease Prediction Using Machine Learning is a web application built on Python, Django, and Machine Learning. The web application uses following models:

1. Support Vector Classifier(SVC)
2. K-nearest neighbor(KNN)
3. Random Forest(RF)
4. Neural Network(NN)
5. Logistic Regression(LR)

The detailed architectural diagram of the system is given (Fig1).

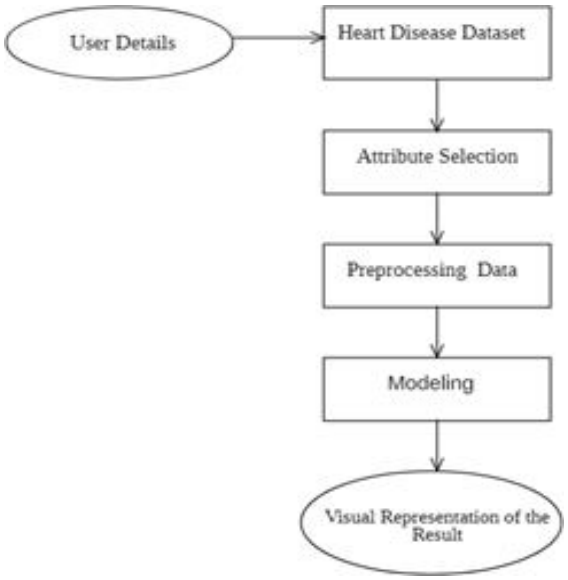


Fig1: Architecturaldiagramforpredictionofheartdisease

5. User Details

In this phase User's details such as Age, Gender, Chest-Pain, Resting BP, Serum Cholesterol, Fasting Blood Sugar, Resting ECG, Maximum Heart Rate, Exercise Induced Angina, ST Depression, Slope of ST Segment, Number of Vessels, and Thal will be collected.

6. Heart Disease Dataset

The dataset that will be used for creating this system are available on Kaggle or UCI Repository. Kaggle Dataset: This dataset has 16 columns and 921 rows.

UCI Heart Disease Data | Kaggle

UCI Repository Dataset: This dataset has 14 columns and 304 rows in total. UCI Machine Learning Repository: Heart Disease Data Set

7. Attribute Selection

The in this phase attributes that are required would be selected using Feature Engineering. The attributes that are required for prediction are explained below in detail.

1. Age - age in years

2. Sex - (1 = male; 0 = female)

3. Cp - chest pain type

- 0: Typical angina: chest pain related decrease blood supply to the heart
- 1: Atypical angina: chest pain not related to heart
- 2: Non-anginal pain: typically oesophageal spasms (non heart related)
- 3: Asymptomatic: chest pain not showing signs of disease

4. Trestbps - resting blood pressure (in mm Hg on admission to the hospital) anything above 130-140 is typically cause for concern

5. Chol - serum cholesterol in mg/dl

- Serum = LDL + HDL + .2 * triglycerides
- Above 200 is cause for concern

6. Fbs - (fasting blood sugar > 120 mg/dl) (1 = true; 0 = false) '>126' mg/dl signals diabetes

7. Restecg - resting electrocardiographic results 0: Nothing to note

1: ST-T Wave abnormality can range from mild symptoms to severe problems signals non-normal heart beat

2: Possible or definite left ventricular hypertrophy enlarged heart's main pumping chamber

8. Thalach - maximum heart rate achieved

9. Exang - exercise induced angina (1 = yes; 0 = no)

10. Oldpeak - ST depression induced by exercise relative to rest looks at stress of heart during exercise unhealthy heart will stress more

11. Slope - the slope of the peak exercise ST segment

0: Upsloping: better heart rate with exercise (uncommon)

1: Flatsloping: minimal change (typical healthy heart)

2: Downsloping: signs of unhealthy heart

12. Ca- number of major vessels (0-3) colored by fluoroscopy

- Colored vessel means the doctor can see the blood passing through
- The more blood movement the better (no clots)

13. Thal - Thalium stress result

- 1, 3: normal
- 6: fixed defect: used to be defect but ok now
- 7: reversable defect: no proper blood movement when exercising Target - have disease or not (1=yes, 0=no) (= the predicted attribute).

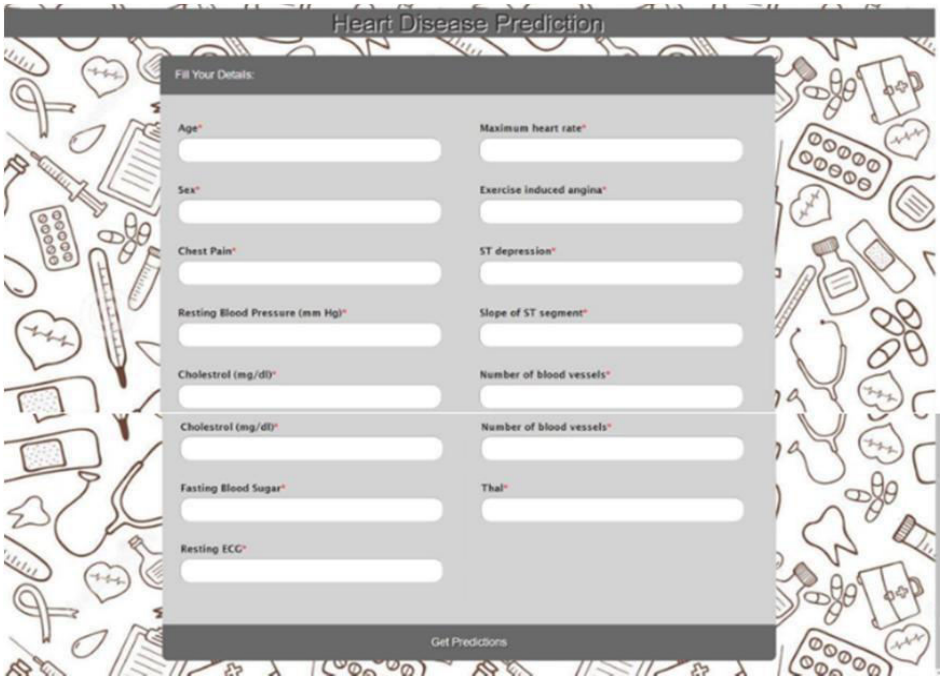


Fig2. Homepageofthesystem

8. DATA PRE-PROCESSING

Data preparation is the most critical first step in any predictive model; it helps to transform data into an understandable format to enhance model efficiency. Medical data are generally incomplete, lacking attribute values, and noisy since containing outliers or irrelevant data [13]. The UCI Cleveland data set used in this study contains six missing values, including four missing values for the number of major vessels (Ca) attribute and two missing values for Heart rate (Thal) attribute. The handle these missing values, we used the “Mode” imputation method that replaced missing values by themost frequently occurring value since all missing values are categorical [14]. The predicted attribute (num) of the original data set contained 5 values; a value 0 indicated the absence of HD and values between 1 and 4 reported different levels of HD, respectively. In this study, we have tendency to have an interest within the presence or absence of HD without interest in the exact disease classification. Hence, the class attribute is reclassified into a binary value of 0 or 1, indicating the absence or presence of HD in the patients, respectively. A detailed diagram for Data pre-processing is given below.

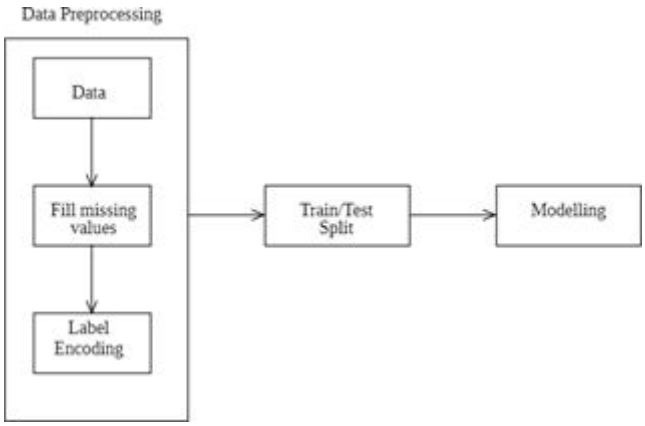


Fig 3: Pre-processing on Dataset

Filling Missing Values: In this step rows that contain missing values will be filled using mean, median method. After filling the missing values the data will then pass to the next step that is label encoding.

Label Encoding: Label Encoding refers to converting the labels into a numeric form so as to convert them into the machine-readable form. Machine learning algorithms can then decide in a better way how those labels must be operated. It is an important pre-processing step for the structured dataset in supervised learning.

Train-Test Split: The train test split technique can be used for classification and regression problems to test machine learning algorithms. The procedure takes the given dataset and splits it into two subsets:

- **Training Dataset:** it is used to train the algorithm and fit the machine learning model.
- **Test Dataset:** Using the input element from the training data, the algorithms make predictions.

The model is first to fit on the available data with known inputs and outputs. It is then run to make predictions on the rest of the data subset to learn from it. This can be used to make predictions on future data sets where the expected input and output values are non-existent.

Fig 4: Heart disease predicted

Fig 5: NO heart disease predicted

Fig 5 shows that three algorithms have shown that the patient does not suffer from heart

Performance measurement In order to evaluate the validity of the predictive model, various measurements can be calculated suchlike sensitivity, specificity, accuracy, and precision, by using the confusion matrix (Table I). Specificity measures the proportion of negatives which are correctly identified, and sensitivity measures the percentage of real positives that are correctly identified [21]. These measures can be mathematically represented by the following formulas. Where TP, TN, FP, and FN signify True Positive (number of positive data that were correctly labelled by the classifier), True Negative (number of negative data that were correctly labelled by the classifier), False Positive (number of negative data that were incorrectly labelled as positive), and False Negative (number of positive data that were mislabelled as negative), respectively.

Table I: Confusion Matrix

		Actual values	
		positive	negative
Predicted values	positive	TP	FP
	negative	FN	TN

$$Specificity = \frac{TN}{TN + FP} \quad (1)$$

$$Sensitivity = \frac{TP}{TP + FN} \quad (2)$$

$$Precision = \frac{TP}{FP + TP} \quad (3)$$

$$Accuracy = \frac{(TN + TP)}{(TN + FP + FN + TP)} \quad (4)$$

9. RESULT

Different experiments are conducted to evaluate the performance and also the validation of the developed model using the Cleveland trained data set with 14 totally different attributes. Results are estimated using confusion matrix measurements and to match the accuracy using totally different algorithms. For the first experiment, we used the train- test split validation technique where our data-set is divided into two parts, and we made several tests with different percentages, the best splitting we achieved is the 70% of the data for training and 30% for testing. Fig 5 Shows the results obtained by applying LR, KNN, SVM, RF, and NN algorithms. Based on the experimental results, it is clear that the classification accuracy of the KNN algorithm is the highest, followed by SVM compared to other algorithms. However, the train-test split validation technique usually causes over fitting since the evaluation may depend mainly on which data is used in the training set and which is used in the test set. Hence, the evaluation may be significantly different depending on how the split is made. Thus, we proposed the cross-validation technique to handle this problem. The cross validation is a robust preventative measure against over fitting it uses the initial training data to generate multiple mini train test splits to tune the model. In our second experiment we used 10-fold cross-validation, where the original dataset spited into 10 same size subsamples, and the accuracy is averaged over all 10 trials to get the total effectiveness of our model. As reflected, each data point gets to be in a test set once and set k1 times in the training. This significantly reduces bias and variance, since we used most of the data for fitting and in the test set. Fig 6 gives the

accuracy obtained using a 10-fold cross validation technique. It can be observed from the Fig 6 that the KNN still worked better, building the model with an accuracy of 91.80%, and SVM was second with an accuracy of 86.88%. We can conclude that KNN performs better and gets better accuracy compared to other algorithms. Also, all the results' accuracy is decreased after using the cross- validation technique.

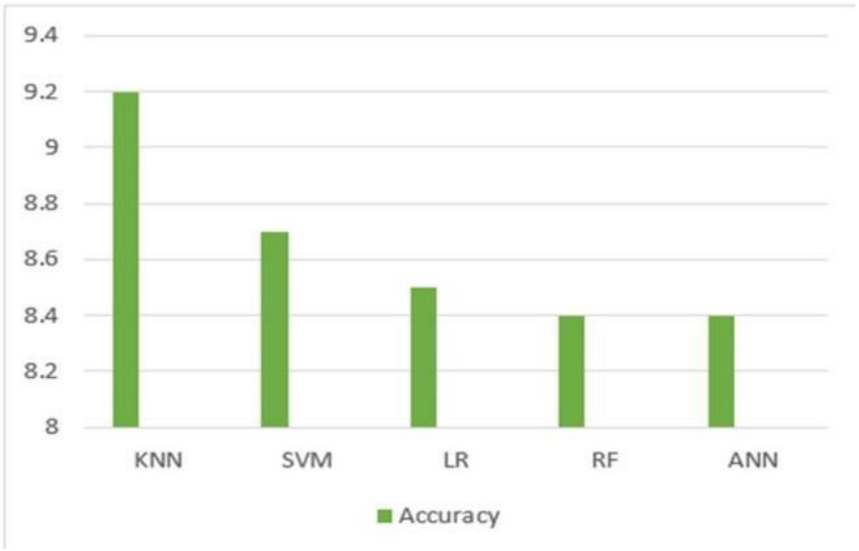


Fig. 6: Comparison of the accuracy of ML algorithms using train/test split technique.

10. CONCLUSION

This study has been conducted to help clinicians to produce an accurate and efficient predictive system, the model validation is conducted with both cross-validation and the train-test splitof data. The results showed that KNN achieved the highest accuracy compared to other algorithms using both validation techniques. Despite the accuracy is decreased once we applied the cross-validation, we tend to believe that this method is that the best in our model since the used data-set isn't large therefore the method did not take an extended time, at the same time we solved the problem of over fitting. The results were significant, and we believe that the achieved results using our predictive model based on ML algorithms could improve the knowledge on the prediction of heart disease risk through better diagnosis and interpretation thus, appropriate clinical decisions.

11. REFERENCES

[1] URL:http://who.int/news-room/fact-sheets/detail/cardiovasculardiseases-(cvds)

[2] URL: http://nhlbi.nih.gov. National heart, lung, and blood institute.

[3] N. Mishra and S. Silakari "Predictive Analytics: A Survey, Trends, Application, Opportunities and Challenges," International Journal of computer science and information technologies, vol 3(3), pp. 4434-4438, 2012.

[4] H. Alharti. "Healthcare predictive analytics: An overview with a focus on Saudi Arabia," Journal of Infection and Public Health, vol 11(6), pp. 749-756, 2018.

[5] R. Detran Heart Disease Dataset. "Retrieved from: http://archive.ics.edu/ml/machine-learning-databases/heartdisease/cleveland.data" 1988.

[6] K. H., Miao, J. H. Miao & G. Miao. "Diagnosing Coronary Heart Disease Using Ensemble Machine Learning," International Journal of Advanced Computer Science and Applications,vol 7(10), 2016.

[7] L. M. Hung, D. T. Toan, & V. T. Lang. "Automatic Heart Disease Prediction Using Feature Selection and Data Mining Technique,". Journal of Computer Science and Cybernetics,vol 34(1), pp. 33-47, 2018.

[8] R. El-Bialy, M. A. Salamay, O. H.Karam, & M.E. Khalifa. "Feature Analysis of Coronary Artery Heart Disease Data Sets". International Conference on Communication, Management and Information Technology. Procedia Computer Science, vol 65, pp. 459-468, 2015.

[9] M. Abdar, R.Sharareh, N. Kalhori, T. Sutikno, I.M. I. Subroto & G . Arji. "Comparing Performance of Data Mining Algorithms in Prediction Heart Diseases," International Journal of Electrical and Computer Engineering, vol 5(6), pp. 1569-1576, 2015.

[10] A. K. Paul, P. C. Shill, R. I. Rabin, & M. A. H. Akhand. "Genetic algorithm based fuzzy decision support system for the diagnosis of heart disease,". IEEE 5th International Conference on Informatics, Electronics and Vision. 2016.

[11] Purushottam, K.Saxena, &R.Sharma (2016). Efficient Heart Disease Prediction System. Procedia Computer Science, 85, 962-969.

[12] Z. Arabasadi, R. Alizadehsani , M. Roshanzamir , H. Moosaei , & A. A. Yarifard. "Computer aided decision making for heart disease detection using hybrid neural network-Genetic algorithm," Computer Methods and Programs in Biomedicine, vol 41, pp. 19-26, 2017.

[13] Montu Saw, Tarun Saxena, Sanjana Kaithwas, Rahul Yadav, Nidhi Lal,"Estimation of Prediction for Getting Heart Disease Using Logistic Regression Model of Machine Learning",2020 International Conference on Computer Communication and Informatics (ICCCI -2020), Pages:6, Jan. 22-24, 2020, Coimbatore, INDIA.

[14] Anjan Nikhil Repaka, Sai Deepak Ravikanti, Ramya G Franklin,"Design And Implementing Heart Disease Prediction Using NaivesBayesian",Proceedings of the Third International Conference on Trends in Electronics and Informatics (ICOEI 2019),Pages:06, 2019.

[15] Baban.U. Rindhe, Nikita Ahire, Rupali Patil, Shweta Gagare, Manisha Darade,"Heart Disease Prediction Using Machine Learning",International Journal of Advanced Research in Science, Communication and Technology (IJARSCT),Pages:08, May 2021.

[16] NinadMarathe ,SushoptiGawade , Adarsh Kanekar, "Prediction of Heart Disease and Diabetes Using Naive Bayes Algorithm", International Journal of Scientific Research in Computer Science, Engineering and Information Technology IJSRCSEIT, May-June-2021.

[17] DhaiEddineSalhi, Abdelkamel Tari, and M-Tahar Kechadi,"Using Machine Learning for Heart Disease Prediction", February 2021

[18] Abderrahmane Ed-daoudy, Khalil Maalmi,**"**Real-time machine learning for early detection of heart disease using big data approach", 2019,IEEE

[19] M.Snehith Raja, M.Anurag, Ch.Prachetan Reddy, NageswaraRaoSirisala," MACHINE LEARNING BASED HEART DISEASE PREDICTION SYSTEM", International Conference on Computer Communication and Informatics (ICCCI 2021), Jan 27-29, 2021

[20] Shaik Farzana, DuggineniVeeraiah, "Dynamic Heart Disease Prediction using Multi-Machine Learning Techniques", 2020 IEEE

[21] Halima EL HAMDAOUI, Saïd BOUJRAF, Nour El Houda CHAOUI, Mustapha MAAROUFI"A Clinical support system for Prediction of Heart Disease using Machine Learning Techniques", 5th International Conference on Advanced Technologies For Signal and Image Processing,2020

[22] Md. Touhidul Islam, Sanjida Reza Rafa, Md. Golam Kibria"Early Prediction of Heart Disease Using PCA and Hybrid Genetic Algorithm with k-Means" International Conference on Computer and Information Technology (ICCIT), 19-21 December, 2020

 ISBN: 978-81-19477-18-0

ANALYSIS OF CARBON EMISSIONS IN FOOD SYSTEM USING MACHINE LEARNING

Dr. Bharati Wukkadada and Nivedita Bhatia
K J Somaiya Institute of Management, Mumbai,

ABSTRACT
Global climate change is mostly caused by carbon dioxide emissions. It is commonly acknowledged that, in order to avert the worst effects of climate change, the world must reduce emissions as soon as possible. However, how this obligation is shared across regions, countries, and individuals has long been a source of debate in international forums. Carbon emissions is the amount of carbon element released from human activity. The greater the emission, the more significant impact it has on the environment. The paper presents the method to identify whether the countries are developed or not based on their carbon emissions/footprint throughout the years. This evaluation is essentialized machine learning methods, i.e., Decision trees, Logistic Regression, and KNN. Through these methods, we can classify the developed or industrialized countries based on the substances produced by the food system. The data used is from EDGAR-global emission inventory for food systems. This research demonstrates the impact of countries collectively on the environment from the food sector.

Keywords: Carbon, Carbon emissions, food, greenhouse gas, carbon footprint, classification, logistic regression, Decision tree, edgar.

1. INTRODUCTION
Food is the necessity to survive and grow on this planet earth. Even the basic need of survival is incorporated of carbon. Everything in this world is compounded with carbon element to maintain the balance the life on the planet earth. Not only driving vehicles or producing smoke, even our lifestyle choices, the food we eat impacts our overall carbon footprint. If we talk about the global emissions, one quarter of it is, is caused by food production and agriculture itself.

Carbon footprint is the amalgamation of greenhouse gas emissions caused by any form of living on this earth. The natural carbon emissions are caused by soil, ocean, etc which supports life on earth. But when humans extract, refine, transport or burn fossils we release an extra amount or greenhouse gas with cutting a source absorbing CO2 leading to greater catastrophic effects. Carbon emissions can be controlled at the consumer level, as producing demand drives production. The increase in greenhouse gas emissions is increase in human activities which results in greater carbon footprint of an individual, organization or a community. The increase in carbon footprint gives us the climate change, droughts, melting glaciers, heatwaves etc.

2. LITERATURE REVIEW
The concept of carbon footprint was developed in the 1990s. It can be measured through various carbon accounting denoted assessments. Food system is responsible for one-third of global greenhouse emission. Several research have been done since the concept came into light. The development of strategies to reduce the carbon footprint of the food system was one of the research programmes in China. It argued that technical means alone will not be able to significantly reverse the direction of climate change, as consumer behaviour has a significant impact on climate change. In other one of the research projects in Spain depicted how dietary choices or sustainable diets can differentiate in environmental sustainability. Since carbon emission with the global atmosphere also effects the health and well-being of humans, several footprint calculating software are also available with increased risk over decade.

3. METHODOLOGY

EDGAR is the global database of human induced emissions of greenhouse gases. The food system globally comprehends necessary economic sectors making sufficiently great contribution to greenhouse emissions. The food system emits far more greenhouse gases than land-based system. Food must be grown, harvested, or captured, transported, processed, packed, distributed, and cooked, with any leftovers disposed of properly. The entire process, from production to disposal, necessitates a tremendous amount of energy. This energy must be available at any given time and in any given location.

```
df.head()
```

	Country_code_A3	Name	C_group_IM24_sh	dev_country	Substance	FOOD_system_stage	Y_1990	Y_1991	
0	AGO	Angola	10:_Southern_Africa	D	GWP_100_CO2	LULUC (Production)	10273.5451	10273.5451	10
1	AGO	Angola	10:_Southern_Africa	D	GWP_100_CH4	LULUC (Production)	7662.4856	7662.4856	7
2	AGO	Angola	10:_Southern_Africa	D	GWP_100_N2O	LULUC (Production)	5009.7985	5009.7985	5
3	ALB	Albania	12:_Central Europe	I	GWP_100_CO2	LULUC (Production)	116.8068	116.8068	
4	ALB	Albania	12:_Central Europe	I	GWP_100_N2O	LULUC (Production)	12.4815	12.4815	

5 rows × 35 columns

Fig 1: Data Exploration

Using a collated database of food system from 1990-2018, countries were classified into two categories; Developed or Industrialized. Four emission substances were found in eight stages of food production. The substances which were contributing to the emission are CO2, CH4, N2O and F-gases. Data of each stage of production was recorded on yearly basis. The predictive models were created using Logistic Regression, Decision Tree Classifier and K-nearest neighbours to identify the country class. In order to design the prediction model data was pre-processed to improve the performance of the model. The pre-processing of data is normalizing raw data or recorded data in order to make it more understandable. The data was divided into training and testing sets. Training Data comprises of 90% of features of data set whereas testing data consists 10% of target of dataset to validate the model. Cross-Validation technique was used for the validation.

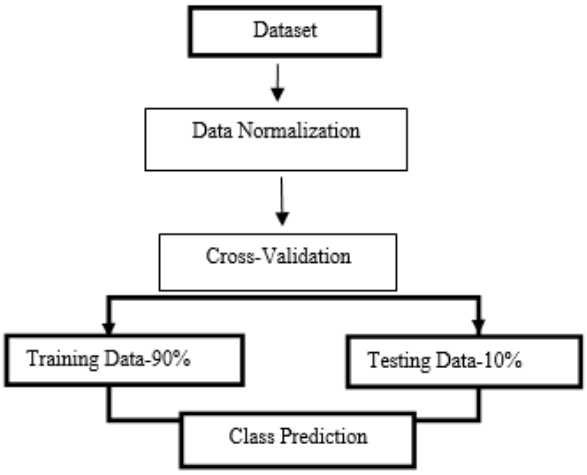


Fig 2: Data Flow

The model was designed to find how the emissions evolves through the different stages of food production system with the growing population and dietary changes and needs. The prediction of country class depends on the evolvement of these various factors. Four features having an object value were label encoded using the label encoder, before splitting the data. Three classification models were used to find the model with the better performance regardless of

same data. The three of the models were logistic regression, decision tree and KNN. The logistic regression model is used to predict the binary outcome which is either yes or no. Whereas, the decision tree model classifies the binary outcome by deciding it from the root and leaf nodes. In the KNN model the binary outcome is determined by calculating the distance between test and training set with identifying the K no of points nearest to the test data. The model with the highest precision was decision tree with accuracy rate of 95% iterated with two max leaf nodes. KNN with 94% accuracy rate was iterated with five nearest neighbors. The model with least accuracy rate was logistic regression with 73% accuracy. The data was scaled using the Standard scaler before being trained in the model.

4. RESULTS

The objective was to attain the model with highest accuracy classifying the country class on dependency of data obtained from lifecycle of food system. It was obtained using the classifier model, decision tree, which resulted in highest precision and accuracy rate. The slight shift was observed between two decades of data. The image below (Fig 3) shows the classification report of Logistic Regression with the accuracy rate of 73%.

```
[[704   2]
 [259   2]]
              precision    recall  f1-score   support

           0       0.73      1.00      0.84       706
           1       0.50      0.01      0.02       261

    accuracy                           0.73       967
   macro avg       0.62      0.50      0.43       967
weighted avg       0.67      0.73      0.62       967

73.00930713547052
```

Fig. 3. Classification Report for Logistic Regression

The below image (Fig. 4.) shows the classification report of Decision tree with the accuracy rate of 95%.

```
[[706   0]
 [ 43 218]]
              precision    recall  f1-score   support

           0       0.94      1.00      0.97       706
           1       1.00      0.84      0.91       261

    accuracy                           0.96       967
   macro avg       0.97      0.92      0.94       967
weighted avg       0.96      0.96      0.95       967

95.55325749741469
```

Fig. 4. Classification Report for Decision Tree

The below image (Fig. 5.) shows the classification report of K-Neighbors with the accuracy rate of 94%.

```
[[699   7]
 [ 43 218]]
              precision    recall  f1-score   support

           0       0.94      0.99      0.97       706
           1       0.97      0.84      0.90       261

    accuracy                           0.95       967
   macro avg       0.96      0.91      0.93       967
weighted avg       0.95      0.95      0.95       967

94.82936918304034
```

Fig.5. Classification Report for K-NeigborsClassifier

5. CONCLUSION

Greenhouse gas emissions have a significant influence on the environment. The global growth in carbon emissions from numerous businesses has an impact on every element. With the recorded EDGAR data of greenhouse emissions at various phases of the food manufacturing system, the overall model aids in identifying the country's class. Adding EDGAR-FOOD to emission-reduction strategies is critical for anticipating future changes in the whole food system and building effective mitigation techniques to prevent non-targeted emissions.

6. REFERENCES

[1] Zhi, Jing, and Jixi Gao. "Carbon Emission of Food Consumption: An empirical analysis of China's residents." *2009 International Conference on Environmental Science and Information Application Technology*. Vol. 2. IEEE, 2009.

[2] Milczarski, Piotr. "Application of Machine Learning Methods in Carbon Footprint Optimization." *2021 11th IEEE International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications (IDAACS)*. Vol. 2. IEEE, 2021.

[3] Scherer, Magdalena, and Piotr Milczarski. "Machine-Learning-Based Carbon Footprint Management in the Frozen Vegetable Processing Industry." *Energies* 14.22 (2021): 7778.

Bharati Vidyapeeth's Institute of Management and Information Technology, Navi Mumbai
(NBA Accredited, Affiliated to University of Mumbai)

BHARATI VIDYAPEETH'S

Institute of Management and Information Technology(NBA Accredited)

Sector- 8, CBD, Belapur, Navi Mumbai - 400 614

www.bvimit.co.in

ISBN 978-81-19477-18-0

NEX GEN PUBLICATIONS

India | UAE | Nigeria | Uzbekistan | Montenegro | Iraq | Egypt | Thailand | Uganda | Philippines | Indonesia

Nex Gen Publications || www. nexgenpublication.com || info@ nexgenpublication.com