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EPIDEMIOLOGIC IMPACTS OF WATER AND WASTE POLLUTANTS ON HUMAN WELL BEING. A CASE STUDY OF APAPA, LAGOS -NIGERIA

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Water quality, trace gas (SO₂, CO₂, and NO₂), particulate matter (PM 10 as well as PM_{2.5}), and effluents emissions were quantified at near cements and oil factories and nearby suburban areas within Apapa Lagos Nigeria. Results display that ambient air particulate matter PM_{2.5} varies between 2.1 to 7.9 µg/m³ and VOC (0.013 – 8.53 µg/m³), while CO and CO₂ was 100% and 30% respectively not within regulatory limits, consequently leads to asthma, coughing and difficulty breathing. Four out of nine sites investigated for noise effect were above WHO stipulated limits. While some parameters such as BOD and COD displays critical level for effluent scrutiny and conductivity, calcium, TDS, total hardness, Do and total alkalinity was also above clean water specification. Wastewater consists of spills and other water effects which produced pollutants such as soluble organic chemicals that deplete dissolved oxygen, anions, volatile materials and other heavy metals. Based on age, the greatest impact (52%) was seen in ages varying from 0 to 16 while that of the age set 16 to 60 was 45%. Curb of oil and cement particulate pollutants and requesting a buffer region between the cement and oil depots and neighborhood complemented with regulatory enforcement and persistent monitoring, should be a top precedence to the regulatory authority.

Keyword: Emission, Particulate, Combustible, Monoxide, Contagion.

AN OVERVIEW OF CRIME AGAINST WOMEN WITH SPECIAL REFERENCE TODOMESTIC VIOLENCE

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At present, crime against women remains a worldwide problem. Crime against women in India reported by (NCRB) is 185,312 cases in 2007, 3,39,457 cases in 2014, 3,29,243 cases in 2015. 3,38,954 cases across the country in 2016. In 2016, the number of women harassed by in-laws was 1,10,434, 66,544 women were kidnapped, 39,068 women were raped, 7,628 women were killed due to dowry, and 462 women were victims of forced abortion, 225 cases of acid attacks. The figures like dowry death, forced abortion and harassment by in-laws are examples of domestic violence against women. It is a very shameful and heart-wrenching topic that today, every moment, women are being insulted and various kinds of obstructions are being done against them. Not only this, but it has also been found in many survey opinions that even in COVID-19 pandemic, there has been a rise in problems like domestic violence. The paper mainly focuses on the kinds, causes and suggestions regarding domestic violence against women. The main causes reported for domestic violence were family set-up, socio-cultural, physiological aspects, and psychological factors. To stop this crime, several steps have been taken along with rituals in which the Domestic Violence Act 2005 is the main one.

Keywords: Women, Cruelty, Domestic, Violence, Harassment

ANALYSIS OF GREEN MARKETING PRACTICES: A MICRO AND SMALL

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Enterprises Perspective Green marketing is a developing idea interfacing feasible inward business tasks and corporate social obligations. Consequently, the review investigated the green showcasing practices of chosen miniature and little endeavors in India. The elucidating causal examination configuration was used, and the 20 lawfully enrolled miniature and little undertakings were purposively chosen. MSEs in India are overwhelmed by sole owners with 1-9 workers, have an expected resource size of 3,000,000 or less, have been in activity for 1-3 years, and have a typical month to month income of 20,000 and underneath. They utilize green showcasing practices, for example, giving safe items and administrations, executing greater climate well disposed methods of contamination avoidance, publicizing green mindfulness and fascination, and using vehicles that consume less energy. MSEs' green promoting rehearses underway, bundling, publicizing, and activity are profoundly compelling, while circulation is less successful. Business profiles and MSE have no massive contrast, barring the distinction between the quantity of representatives and the apparent adequacy of green showcasing rehearses concerning activity. MSEs confronted troubles in dissemination because of wellbeing conventions and absence of assets.

Keywords: green marketing, green marketing practices, micro and small enterprises, dissemination

A SURVEY ON DETECTION OF OIL-SPILL IN SATELLITE-BASED SYNTHETIC APERTURE RADAR (SAR) IMAGES USING NEURAL NETWORK

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The use of satellite and airborne remote sensing has become standard practice for global oil spill monitoring. When oil leaks into the water, it is an immediate crisis. Monitoring oil spill on the sea surface is made possible using optical remote sensing. On the sea's surface, there is a moving oil leak. An essential part of preventing and mitigating oil spills is quick and effective monitoring of the location, size, and effects of the spill. Only a small sample of data may be collected due to the influence of cloud and weather, the limits of the satellite revisit duration, and other factors. The capacity to learn sample characteristics using a single supervised classifier in the case of small samples is constrained, which can not meet the needs of accurately monitor oil spill. By using neural network the oil spill regions has been extracted in radar image. In this paper we will be studying the survey of various papers related to oil spill detection.

Keywords: Convolutional neural networks (CNNs), DEEPLABV3, feature extraction, oil spill, segmentation, synthetic aperture radar (SAR), U-NET

A COMPARATIVE REVIEW OF MACHINE LEARNING TECHNIQUES FOR AUTISM SPECTRUM DISORDER PREDICTION

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Autism Spectrum Disorder (ASD) is a neuro- developmental disorder that affects how people interact with others, communicate, learn, and behave. Initial signs typically appear in the early stages of childhood. Children with ASD are prone to several unusual or repetitive behavioral changes including problems with speech, touch, eye contact, and facial expression. Autism is described as a developmental disorder since these symptoms become more severe as age progresses. The best and most effective way to detect and treat ASD is by early diagnosis. This article presents a comparative review of the different machine learning and deep learning techniques for autism spectrum disorder prediction. It highlights the works of many researchers and provides an analysis of the various machine-learning techniques that are used for the detection of autism spectrum disorder.

Keywords: Autism Spectrum Disorder, Machine Learning, Deep Learning.

ANALYSIS OF AVAILABILITY OF ICT INFRASTRUCTURE ON USE OF ICT IN TEACHING-LEARNING

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Utilizing Information and Communication Technology (ICT) in Learning process depends upon availability of its related infrastructure like computing device, internet connectivity, smart class room, software etc. at institution and with students. If adequate infrastructure is available then only it can be utilized by the students in learning process. This paper emphasize on analysis of ICT infrastructure with students. A questionnaire consisting 23 questions using two options: Yes and No was framed for collecting data related to availability of ICT infrastructure. The data were collected from 566 students and analyzed in terms of various groups like: Gender (Male and Female), Institute type (University and college) and discipline (Science and Non-Science). Empirical results show that availability of ICT related infrastructure does not differ in different groups. There are about 10% difference of ICT infrastructure in between various groups. However responses related to questions to join any MOOC course and availability of Kindley reading device are more negative than positive, means less number of students have joined any MOOC course and having kindley reading device. Empirical data also show that adequate ICT facilities are available with different groups of students. It was also observed that mobile computing device is most preferred device and popular among students to use ICT in learning.

Keywords: Information and Communication Technology (ICT), ICT infrastructure, Teaching-Learning.

IMPROVED MEMORY TYPE RATIO ESTIMATOR FOR POPULATION MEAN IN STRATIFIED RANDOM SAMPLING UNDER LINEAR AND NON-LINEAR COST FUNCTIONS

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This paper offers an improved memory type ratio estimator in stratified random sampling under linear and non-linear cost functions. The issue is given as All Integer Non-linear Programming Problems (AINLPPs). The sampling properties mainly the bias and the mean squared error of the introduced estimator are derived up to the first order of approximation. The optimum value of the characterizing scalar is obtained by the Lagrange method of Maxima-Minima. The least value of the MSE of the suggested estimator is also obtained for this optimum value of the characterizing constant. The suggested estimator is compared both theoretically and empirically with the competing estimators. Under this setup, the optimum allocation with mean square error of the suggested estimator is attained, and the estimator is compared to other comparable estimators. The AINLPP is solved using the genetic programming approach, which is applied to both actual and simulated data sets from a bivariate normal distribution.

Keywords: Stratified random sampling, Ratio estimator, Linear cost function, Non-linear cost function, Genetic programming technique, AINLPP.

HEPATOPROTECTIVE POTENTIAL OF KYLLINGA MONOCEPHALA

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The present study was carried to evaluate the hepatoprotective potential of traditionally used tropical plant, *Kyllinga monocephala*, against paracetamol and carbon tetrachloride induced hepatic toxicity. Methanolic extract at dose levels of 200 and 400 mg/kg offered significant hepatoprotective action ($P < 0.01$) by reducing the serum marker enzymes like serum glutamate oxaloacetate (SGOT), serum glutamate transaminase (SGPT). They also reduced the elevated level of serum alkaline phosphatase (ALP) serum acid phosphatase (ACP) and serum bilirubin. Reduced enzymic and nonenzymic antioxidant levels and elevated lipid peroxide level were restored to normal by administration of *K. monocephala* extract. On histo-pathological examination, pathological changes like steatosis, fatty infiltration and necrosis were almost absent in the extract treated group. The results positively indicate the hepatoprotective effect of *K. monocephala* extract against drug induced hepatic damage. The presence of flavonoids in the extract seems to be the probably involved in this protective action.

Keywords: hepatoprotective, *Kyllinga monocephala*, carbon tetrachloride

ROLE OF MOBILE COMPUTING IN OUR DAILY LIFE: CASE STUDY & ITS IMPORTANCE

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Mobile computing has progressed very rapidly in our society today. Mobile computing has provided a new style of learning that is accessible from anywhere, which is considered to be an essential learning style in the future. We can learn at the exact time whenever we need to learn in our daily lives. This technology is very popular and people like it the most. People get the solution of the biggest problem through mobile. Really it is nothing less than a miracle. This Technical information that allows the transmission of data. Cellular presents enormous benefits for companies that decide to integrate science into their ongoing organizational expertise process. From Wi-Fi laptops to cell phones and Wi-Fi/Bluetooth enabled personal digital assistants to wireless sensor networks, Mobile computing has become ubiquitous in its impact on our daily lives. The purpose of this paper is to point out one of the characteristics, applications and constraints of mobile computing.

Keywords: Mobile, Computing, Rapidly, Learning, System, Miracle, Technical, Information, Transmission, Sensor, Network, Applications.

A MIRROR AND A DOOR MOVING TOWARDS CULTURALLY RESPONSIVE TEACHING IN HIGHER EDUCATION

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A robust curriculum is a mirror and a door that builds knowledge and extends perspective. This means that students need to be able to see themselves in what they're learning as a reflection of themselves and their histories, and also must be encouraged to see outwards and consider perspectives and experiences vastly different from their own.

Culturally responsive teaching (CRT) is a research-based pedagogical approach that focuses on acknowledging and validating the lived experiences and assets students bring to the classroom empowering students with meaningful cultural referents so as to strengthen students' sense of identity, promoting equity and inclusion, engaging students in course material, and promoting critical thinking and reflective reasoning.

Culturally responsive educators recognize that understanding students' lives and perspectives can help foster a sense of belonging that ensures all students feel recognized, respected, and challenged. Culturally responsive educators address and remediate their biases, introspect on how their own identities impact their practices, recognize systems of oppression, and understand the sociopolitical context in which education operates.

Gen Z is the current generation enrolled in higher education, and they are more racially and ethnically diverse than any previous generation valuing multiculturalism and social justice. The best way to meet the educational needs of these learners is for educators to adopt culturally responsive educational practices, and minority-serving institutions, in particular Historically Black Colleges and Universities, are at the forefront of much of this work. This presentation will explore the concept of culturally responsive teaching, summarize the findings in the existing literature, discuss easily adoptable practices that can support culturally responsive teaching practices in higher education, and relay how minority serving institutions can, and are, furthering this charge.

Keywords: earning, Culturally responsive teaching (CRT), Culturally responsive educators

MACHINE LEARNING SENTIMENT ANALYSIS TO PREDICT INDIAN STOCK MARKET

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Indian stock market is influenced by political, financial, and various internal and external factors. It is very challenging for academicians to accurately predicts the behaviour of stock market. Now days, social media plays very important role in all the fields where people share their opinions on various topics depends on what they wish to written. Social media play a very important role to know about the current trends of stock data as now days people share their views in social media whether it is positive or negative. In this study, we analyse sentiments of people on the stock market using twitter data and develop an analytical model using machine learning techniques for classification such as: Bernoulli Naive Bayes, SVM (Support Vector Machine) and Logistic Regression and perform comparative study to find out which model is outperforming for sentiment analysis of Indian stock market.

Keywords: Stock Data, Semantic Analysis, Twitter, social media, Bernoulli Naive Bayes, SVM (Support Vector Machine), Logistic Regression.

EXPLORING THE ROLE OF IOT IN SMART AIR QUALITY MONITORING

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How to report air Quality under IOT with its help. Said it is being used . Will learn about The health of animals, plants and humans living in any place depends on the air there , but in today's time a Question mark has been put in the quality and purity of the air . Which is very important to be monitored. Areas where air quality is extremely low , the level of air purity should be tracked . in this study, the importance of IOT in improving the air quality of the areas will be seen and evaluated. At which places, how monitoring and sensors are being used .etc.

Keywords: Internet, Artificial intelligence, weather reporting, weather monitoring

INVESTIGATION OF VARIOUS EXISTING IOT BASED FRAMEWORKS FOR SMART CITIES AND COMPARISON OF VARIOUS METHODOLOGIES USED IN SMART CITIES : SCOPES IN CHHATTISGARH

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Smart Cities and IoT plays an important role in daily to daily life of the people . IoT provides various services to modular and scalable framework for the peoples living in Smart Cities . IoT provides different scopes in the digital and technological needs to the peoples of Chhattisgarh and raises various opportunities to develop the Life standards of the citizens of Chhattisgarh. Investigating the current existing IoT based frameworks used in Smart Cities of India like Noida, Jaipur, Hyderabad, Bengaluru, New Delhi . The main objective is to Compare the excellent methodologies and features used in Noida, Jaipur, Hyderabad, Bengaluru, New Delhi and finding the scopes in various cities of Chhattisgarh like Raipur, Bilaspur , Durg , Bhilai , Ambikapur, agdalpur , Raigarh, Rajnandgaon . Some scopes and actions to take place by the State Government of Chhattisgarh through Nagar Nigams , Nagar Palikas , Town and Country Planship Authority , Vikash Pradhikarans etc . Investigating Cognitive IoT framework in prospect to Chhattisgarh is also necessary for the proper formulation of various methodologies in Chhattisgarh. In this paper we provide a holistic way how to use Internet of Things with Artificial Intelligence , Machine Learning , Deep Learning and Cloud Computing to make cities of Chhattisgarh Smarter and convert them to Smart Cities with value aided services and facilities.

Keywords: Modular framework , Scalable framework , Artificial Intelligence , Machine Learning , Deep Learning and Cloud Computing .

A REVIEW ON PHARMACOLOGICAL AND PHYTOCHEMICAL INVESTIGATIONS ON *CORDIA MACLEODII* HOOK.F. & THOMSON

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India, a nation that is inhabited by an abundance of indigenous people and has one of the world's most diverse arrays of flora and fauna in its forests, is in a unique position to make significant contributions to the field of ethnomedicine. *Cordia macleodii* Hook, a significant medicinal plant that belongs to the family Boraginaceae and is listed as an endangered taxon, has a wide range of applications in both Western and traditional medicine. Tannins, saponins, alkaloids, phytosterols, and phenolics are only some of the bioactive components that have been extracted from the stem, tree bark, leaves, and flowers of the plant, as well as solvent extracts. In general, the plant has properties that are beneficial to the liver, including those that are hepatoprotective, anti-microbial, wound-healing, anti-venom, and hypertension. These properties have significant value in the pharmaceutical sectors. It is a medium-sized tree that the tribal people of Orissa, Chhattisgarh, and Madhya Pradesh refer to as Panki or Shikari. These trees are only found in extremely remote areas of the forests. Apart for its hepatoprotective properties, the plant has not been examined for its pharmacognostical features or for its pharmacological actions up until this point. This review focuses on the screening of the primary chemical constituents of all the useful parts and their pharmacological activity so that they can be successfully utilised in the pharmaceutical industries for the purpose of producing novel drug formulations.

Keywords: Phytomedicine, antivenom, Chhattisgarh, forest wealth, phytoconstituent

PATCH WISE ASYMMETRY ANALYSIS OF THERMOGRAMS FOR PREDICTING BREAST ABNORMALITY LEADING TO BREAST CANCER DETECTION

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Breast cancer is one of the most common and main reason of death for women all over the world. About one in eight of women is subject to breast cancer over the course of her life time. There is no effective method to prevent or know the reason of growing these cancerous cells, however the number of deaths can be reduced by early detection. Breast cancer detection and classification is the most important fields that the researchers are working on. Thermal breast images are considered as an efficiently screening strategies. The aim of this study is to develop an efficient system to detect breast cancer by using image processing techniques. In this proposed project, we have introduced a new method of cancer detection in dynamic thermograms. The model temperature changes during thermography process using thermal texture analysis methods. Our method produces a compact but detailed representation for the entire sequence of thermograms of each case. We input the representation collected from common and cancer cases into the mlp classification to form a taxonomic model. The proposed method achieves excellent classification results in terms of AUC, accuracy, recall and f-score.

Keywords: Breast cancer, Thermography, AUC, f-score, Thermal texture analysis, Dynamic Thermograms.

IN VITRO EVALUATION OF HEPATOPROTECTIVE PHYTOCHEMICALS AGAINST DAMAGE CAUSED BY CCL₄

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The *in vitro* evaluation of the hepatoprotective activity of plants is vital to assess their potency. This work aims to evaluate the pre-treatment of HepG2 cell lines with hepatoprotective phytochemicals against the damage caused by carbon tetra chloride (CCl₄).

The antioxidant activity was determined by 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging measurements. The three phytomemicals Silymarin (SLM), Quercetin (QCN) and Glycyrrhizin (GCZ) were selected for evaluations. The hepatotoxicity by CCl₄ and cytotoxicity assess through estimation of alanine aminotransferase (ALT), aspartate aminotransferase (AST), lactate dehydrogenase (LDH); total antioxidant capacity (TAOxC), superoxide dismutase (SOD), Glutathion (GSH) lipid peroxidation malondialdehyde (MDA) levels and cell viability,

The antioxidant effect was revealed by QCN (38.69+- 0.74g/ml) and GCZ (14.14+- 0.63 g/ml) in DPPH assessment. The significant alteration was observed in enzyme activities, cell viability, lipid peroxidation, TAOxC, GSH and SOD levels by treating with CCL₄. These changes were maintained significantly till an contact time of 3 hrs. SLM, QCN and GCZ were not noticed for any cytotoxicity. CCl₄ was more compatible in inducing cell damage. The phytochemical QCN revealed significant hepatoprotective. AST, LDH, and MDA levels were acceptable markers of liver injury.

Keywords: HepG2 cell line, Hepatoprotective, Carbon tetrachloride, Glycyrrhizin, Quercetin, Silymarin.

ARTIFICIAL INTELLIGENCE IN HEALTHCARE

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Artificial intelligence is revolutionizing-and strengthening-modern healthcare through technologies that can predict, grasp, learn, and act, whether it's employed to identify new relationships between genetic codes or to control surgery-assisting robots. It can detect minor patterns that humans would completely overlook. This study explores and discusses the various modern applications of AI in the health sector. Particularly, the study focuses on three most emerging areas of AI-powered healthcare: AI-led drug discovery, clinical trials, and patient care. The findings suggest that pharmaceutical firms have benefited from AI in healthcare by speeding up their drug discovery process and automating target identification. Artificial Intelligence (AI) can help also to eliminate time-consuming data monitoring methods. The findings also indicate that AI-assisted clinical trials are capable of handling massive volumes of data and producing highly accurate results. Medical AI companies develop systems that assist patients at every level. Patients' medical data is also analyzed by clinical intelligence, which provides insights to assist them improve their quality of life.

Keywords: would completely overlook, AI in the health sector, surgery-assisting robots. monitoring methods, Medical

INVESTIGATING THE IMPACT OF THE INTERNET OF THINGS IN HIGHER EDUCATION

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There has been an evolution in the field of education, with the introduction of new and innovative methods of teaching. We have revolutionized the way students learn, by providing them with more interactive and engaging experience. IoT in education has been a game-changer move. With time, more and more educational institutions are using IoT technologies, especially after the pandemic. They use IoT-enabled devices in their learning infrastructure to streamline processes and ease life for the management, educators, students, and parents. IoT provides students with better access to learning materials, key resources tracking and real-time or archived communication with other learners and instructors. It allows students to use mobile IoT devices to automate education tasks, such as attending lectures, note-taking, research, etc.

Keyword: education, IoT, mobile IoT devices.

IMPORTANCE OF CRYPTOGRAPHY IN NETWORK SECURITY

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With the initiation of the World Wide Web and the appearance of e- commerce applications and organizations social networks, across the world generate a large amount of data daily. Information security is the most extreme basic issue in guarantying safe transmission of data through the web. Also network security issues are now becoming important as society is moving towards digital information age. As more and more users connect to the internet it attracts a lot of cyber-attacks. It requires to protect computer and network security i.e. the critical issues. The immorality hubs make an issue in the system. It can utilize the assets of different hubs and safeguard the assets of its own. In this paper we provide an overview on Network Security and various techniques through which Network Security can be improved i.e. Cryptography.

Keywords: Security, Threats, Cryptography, Encryption, Decryption.

CHAIN RATIO CUM GENERALIZED PRODUCT-BASED ESTIMATOR FOR POPULATION MODE USING TWO AUXILIARY INFORMATION UNDER SIMPLE RANDOM SAMPLING

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Statistics practitioners frequently come across datasets with skewed distributions. In this case, the mode is thought to be a better location-based than the mean or median. In this study a chain ratio cum generalized product type estimator is proposed for estimating the population mode of the study variable using two auxiliary information under simple random sampling. The bias and mean square error are mathematically determined to approximately order one, and theoretical comparisons with competing estimators are conducted. The present study demonstrates that the suggested estimators for simple random sampling has a lower mean square error than the simple mode estimator, and traditional ratio estimators under the obtained theoretical conditions. The results of our simulations indicate that the suggested estimators outperform the alternatives.

Keywords: Mode estimation, simple random sampling, auxiliary information, skewed distribution, a simulation study

FOREST MANAGEMENT INFORMATION SYSTEM (FMIS): AN INTEGRATED APPROACH TO FOREST MANAGEMENT

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The Forest Management Information System (FMIS) is envisaged as an integrated system which will be used to support the planning, implementation and monitoring of multi-objective forest management activities. The principle of participatory forest management, popularly known as joint forest management in India, is based on 'co-management' and a 'give and take' relationship between the two major stakeholders, village communities and the Forest Department, mediated in most cases by a non-governmental organization.

The FMIS has evolved to such an extent that it acts as an integrated management tool, bringing synergy between sustainable forestry and state of art technologies. FMIS covers Comprehensive Geodatabase development, Research & Development, Forest mapping, Remote Sensing, Application software development, Forest management and planning, Networking and communication, Training and capacity building. Modern, responsible forest management focuses on ensuring the sustainability of forest resources, ecosystems, and the social and economic structures that rely on them. It is no longer considered acceptable for strategic, tactical and operational planning to be undertaken in isolation. All levels of planning must be linked over all time horizons, and plans must be tied to monitoring systems. Decisions should be based on what is best overall for the organisation. Being aware and sensitive to the fact that the complete implementation of all aspects of an integrated FMIS can span around 10 to 15 years, depending on the size of a Forest Department comprising Resource allocation for people, equipment, data creation and its periodic updation and validation, training, maintenance and repair, upgrades and software support should take cognizance of such a time horizon.

Keywords: FMIS, Integrated system, sustainable forestry, Remote sensing etc.

STAKEHOLDERS' PARTICIPATION IN THE SUSTAINABLE DEVELOPMENT: AN ANALYSIS FROM INDIAN LEGAL PERSPECTIVES

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Development is universally recognized rights of people. From Stockholm to Stockholm+50 global sustainable development principles have been promulgated for maintaining the intra and inter generational equity over the natural resources. Participation of stakeholders in the sustainable development at domestic levels is one of the important goals set out by the United Nations under Sustainable Development Goals (SDGs) 12 and 17 and UNGA Framework Principle 9. This research paper explores the Constitutional law of India and other laws conferring rights to the Indian stakeholders to effectively participate and assess socio-economic- environmental aspects of the governmental developmental schemes and programmes. The participatory rights of the stakeholders have been examined from the point of pre and post consultation rights of the local stakeholders; their rights to bring legal actions for the green crimes. The key stakeholder groups for this research paper are elected representatives of Village and District Panchayats, NGOs, individuals and academics.

Keywords: Right to Development, Stockholm Declaration, Rio Declaration, Rio+20 Declaration, Stockholm +50 Declaration, Sustainable Development, SDGs, Participation of Stakeholder, pre and post consultation, Green Crimes, Legal Actions.

ARTIFICIAL INTELLIGENCE FOR MENTAL HEALTH CARE

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Artificial intelligence (AI) is increasingly employed in healthcare fields such as oncology, radiology, and dermatology. However, the use of AI in mental healthcare and neurobiological research has been modest. Given the high morbidity and mortality in people with psychiatric disorders, coupled with a worsening shortage of mental healthcare providers, there is an urgent need for AI to help identify high-risk individuals and provide interventions to prevent and treat mental illnesses. While published research on AI in neuropsychiatry is rather limited, there is a growing number of successful examples of AI's use with electronic health records, brain imaging, sensor-based monitoring systems, and social media platforms to predict, classify, or subgroup mental illnesses as well as problems like suicidality. This article is the product of a Study Group held at the American College of Neuropsychopharmacology conference in 2019. It provides an overview of AI approaches in mental healthcare, seeking to help with clinical diagnosis, prognosis, and treatment, as well as clinical and technological challenges.

Keywords: Compassion; Depression; Emotional regulation; Machine learning; Robot;

IOT BASED SMART CLASSROOM

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Innovative education is assisted with new technology, computers, projectors, internet, and so on. Various information is being spread among the people. By integrating computers, software's, technology behind audience, assistant devices and audio-visual services, the smart classrooms are now delicate. The old-style teaching-learning approach using lecture and notes writing actually bring down the achievement in modern day education. The main goal of this project is to propose a system that is capable of providing a smart classroom along with automation of a classroom interconnected to achieve automation at higher level in education. The main objective of this project is to afford an efficient learning environment. The model of the smart classroom has been integrated by connecting Raspberry pi with LCD display and the smartphone that is controlled via the internet. This model will bring the automation in the attendance, to display circulars on notice board, online suggestion box and taking of lecture notes in order to manage the time and to make the classroom smart in real time.

Keywords: Automation, IoT, Raspberry Pi, Smart Classroom.

IMPACTS OF WATERSHED DEVELOPMENT PLANS IN SURGUJA DIVISION.

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The Government of India (GOI) adopted watershed management as a strategy to address the sustainable agricultural productivity in the rainfed areas since the last three decades. Further GOI Has adopted watershed management as a national policy since 2003. These days, India's development plans pay considerable attention to watershed development programmes (WDPs), which are primarily focused on enhancing and maintaining productivity levels. With the use of appropriate production and conservation strategies, these programmes aid in enhancing and raising the level of productivity in the dry lands region. The present study attempted to document the on-site and off-site effects of the watershed development programmes in Surguja division of Chhattisgarh as it observed an increase in ground water level, rise in surface water and stream flow, reduction in runoff as well as soil erosion, change in land use and cropping patterns, increased agricultural and dairy production improved livelihood and employment generation. The results indicated that there was an increase in the percentage of cropland in both Kharif and Rabi, but in Zaid they began taking crop, especially cucumber, melon, and vegetables which were previously left fallow. There is a positive change in the land use pattern in the WDP regions. In these regions it is recorded that more waste land were converted for productive use by the farmers which have resulted in an increase in net sown area.

Keywords: watershed, Rainfed, production, conservation, runoff, wasteland.

ARTIFICIAL INTELLIGENCE IN FINANCE

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Artificial intelligence (AI) is rapidly transforming the global financial services industry. As a group of related technologies that include machine learning (ML) and deep learning (DL), AI has the potential to disrupt and refine the existing financial services industry. I review the extant academic, practitioner and policy related AI literature. I also detail the AI, ML and DL taxonomy as well as their various application in the financial services industry.

Keywords: Artificial intelligence, Machine learning, Natural language processing, Financial decision making.

A REVIEW ON ARTIFICIAL INTELLIGENCE IN AGRICULTURE

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Agriculture Sector plays important role in economic sector. The artificial intelligence is main concern and the emerging subject all across world. And population increasing day by day and with the increasing demand employment and food is also increasing. Our traditional method which was used by the farmer were not sufficient enough to fulfill the requirements. Consequently, synthetic intelligence technique is added. This method supplied meals requirement and employment possibilities to many people. Artificial Intelligence in agriculture has added associate agriculture revolution. This generation has covered the crop yield from different factors like weather adjustments, populace increase, employment problems, and meals protection issues. This era includes crop yields caused by various factors such as climate change, population surge, employment issues, and food security issues. The main difficulty of the document is to verify the many artificial intelligence applications in agriculture, including irrigation, weeding and spraying integrated with sensors and other tools used in robots and drones. These technologies can save extra water, the use of pesticides and herbicides, maintain soil fertility, and also help to effectively use manpower, increase productivity, and improve service quality. Implementation of automation in agriculture

Keywords: artificial intelligence, robots and drones, food security

WASTE MANAGEMENT, IMPACT AND METHODS.

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Waste management involves the processes of waste collection, transportation, processing, as well as waste recycling or disposal. Sustainable waste management systems include advanced management strategies to minimize environmental challenges and protect resources. Waste management reduces the effect of waste on the environment, health, and so on. It can also help reuse or recycle resources, such as; paper, cans, glass, and so on. There is various type of waste management that include the disposal of solid, liquid, gaseous, or hazardous substances. For the purposes of this review these sources are defined as giving rise to four major categories of waste: municipal solid waste, industrial waste, agricultural waste and hazardous waste. Poor waste management - ranging from non-existing collection systems to ineffective disposal -causes air pollution, water and soil contamination. Open and unsanitary landfills contribute to contamination of drinking water and can cause infection and transmit diseases. The 3Rs are used to refer to the three terms that are – Reduce, Reuse and Recycle. While recycling is easily using the material again, once it is finished, reusing is discovering a new, alternate way to utilize the trash instead of discarding it.

Keywords: environment, hazardous, discovering, contamination

USE AND ACCESSING OF IOT WAY OF ANDROID

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The intention of this study is to investigate how smartphone are impacting the society and also how smartphone are going to transfer the culture ,social life, technology landscape and other device aspect of modern society ,the intention of this study is to understand all the positive and negative aspects of smartphone on the society the study will primarily focus on impact of smartphone on business ,education, health sectors, human psychology and social life. At the end, the study will summarize the impact and conclude based on wide range of impacts that smartphone's have on society. the paper will also recommended solutions ,in order reduce the negative impacts of smartphone's and realizes more benefits of this exiting technology.

Keywords: Smartphone, mobile application, health, social impact.

DEFORESTATION AND ECO-ENVIRONMENTAL CONSEQUENCES

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Deforestation is a significant environmental challenge that has been occurring for many years. It refers to the destruction of forests or wooded areas, primarily for human purposes. The primary drivers of deforestation include logging, agriculture, urbanization, and population growth. Deforestation has a severe impact on the environment, and it is one of the leading causes of biodiversity loss. When forests are cleared, the habitats of many species of plants and animals are destroyed, which can lead to their extinction. Deforestation also causes soil erosion, which can result in the loss of nutrients in the soil and reduced soil quality. When forests are removed, the sediment levels in water bodies increase, which can cause problems for aquatic life. Another significant consequence of deforestation is its impact on climate change. Trees absorb carbon dioxide, which is a greenhouse gas that contributes to global warming. Deforestation is responsible for approximately 10% of global greenhouse gas emissions. Efforts to address deforestation have included policy and conservation measures. For example, governments have implemented laws and regulations to prevent deforestation, and many organizations work to protect forests and promote sustainable land use practices. By protecting forests, we can ensure that they continue to provide essential ecosystem services such as clean air and water, habitat for wildlife, and carbon storage, which are vital for a healthy planet.

Keywords: Environmental, Deforestation, Greenhouse, Wildlife, Detrimental, Policy, Ecosystem

A STUDY OF IOT–IMPLEMENT SOLUTION OF SMART WASTE MANAGEMENT

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Internet of Things (IoT) has attracted widespread applicability not only limited to smart cities and communities but also in water, waste management and so on. One technology that authorities can use to improve garbage management is the internet of things. IoT technologies are already part of mainstream supply chains, demonstrating this fact. Not only that, but IoT management system have proven to be invaluable in this business for optimizing and automating processes. From day to day, countries, regions, cities, and municipalities embrace the “smart” system and solution in their operations. Accordingly, key waste management players are already operating with digitized solutions. So IoT technology is a crucial step to embed in your operations. Existing technology such as Low Power Wide Area Network (LPWAN) with Long Range (LoRa) has been promising. A Smart Waste Management System makes a smart city Complete. In this project we are going to use the sensors and Other components to make the smart dustbin which help to Make clean and green India also help to reduce the diseases Occur due to waste.

Keywords: IoT demonstrating diseases sensor.

CURRENT STATUS OF HERBAL DRUGS IN INDIA AND SOURCE OF HERBAL DRUGS

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Herbal medicine is defined as a non-vitamin, non-mineral natural product. World Health Organization reports 80% of the world's population utilizes herbal remedies for healing. Herbal drug plants refer to using a plant's seeds, berries, roots, leaves, bark or flowers for medicinal purposes. Example: Holy basil, Aloe barbadensis mill, Curcuma longa, Zingiber officinale, Phyllanthus emblica hennon-alopathic India More than 70% of INDIA'S 1.1 billion population is still using non-alopathic. In India, nearly 9,500 registered herbal industries and a multitude of unregistered cottage-level herbal units depend upon the continuous supply of medicinal plants for manufacture of herbal medical formulations based on Indian Systems of Medicine. It is estimated that more than 6,000 plant species forming about 40% of the plant diversity of the country are used in its codified and folk healthcare traditions. Earliest recorded use of a medicinal plant has been mentioned in 'Rigveda'. Middle of 19th century, 80% of all medicines were herbal Even today 25% of drugs are derived from plant source Most of these drugs came from traditional lead, folk knowledge etc. Some of these still could not substituted despite the enormous advancement in synthetic chemistry eg. Reserpine, taxol, vincristine etc.

Keywords: herbal drugs, medicinal plant, Indian herbal industry

SOIL CONSERVATION

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Soil conservation is an important practice that aims to protect soil from erosion, nutrient depletion, and other forms of degradation caused by human activities. Soil conservation measures include the use of cover crops, crop rotation, terracing, contour farming, and other techniques that help to maintain soil health and fertility. The importance of soil conservation cannot be overstated, as soil is a vital resource for food production and ecosystem services such as carbon sequestration and water regulation. However, soil conservation faces several challenges, including the overuse of chemical fertilizers, deforestation, and unsustainable land use practices. Addressing these challenges requires a holistic approach that combines effective policy and governance, education and outreach, and the adoption of sustainable land management practices. This abstract provides an overview of the importance of soil conservation and the challenges facing the sector, emphasizing the need for collective action to promote sustainable soil management practices for the benefit of future generations.

Keywords: soil conservation, erosion, nutrient depletion, crop rotation

A REVIEW ON LOAD BALANCING ALGORITHMS USED IN CLOUD COMPUTING

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Cloud computing is an advanced networking concept in the field of computer networking in which the computing resources (such as software, hardware etc.) are provided as service through the internet. The service providers manage all the required systems which they want to provide users on demand. The service providers need to manage all the demands by its customers efficiently with minimum delay while maintain the cost reasonably low to gain profit. However the managing of resources with demand is not so easy because of the complex load characteristics which depends upon so many factors which causes large variation in load(total data coming into the cloud for processing) and the type of service requirements (like multimedia processing, database management technique. This paper presents functionality of cloud with some basic load balancing techniques and discusses some of the most recently proposed techniques.

Keywords: Cloud Computing, Resource management, Algorithm.

AGRO FORESTRY EX-SITU CONSERVATION

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In situ and ex situ conservation focuses on the maintenance of species diversity within or away from their natural habitats, respectively. This article outlines why conservation is needed, the major threats to species, and how diversity is maintained at the ecosystem, species, and genetic levels. A model for biodiversity conservation is presented which includes: selection of target taxa for conservation, gene pool concepts, ecogeographic surveys, field surveying, clarification of conservation objectives, the two basic conservation strategies (in situ and ex situ) and the range of conservation techniques, and ways that conservation is often linked to some form of utilization.

Keywords: agro forestry, ex-situ conservation, bio-diversity,

WASTE MANAGEMENT: DISPOSAL OF WASTE MATERIALS IN INDIA

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Waste management refers to the collection, transportation, processing, and disposal of waste materials. Effective waste management is essential for maintaining a healthy and sustainable environment, as well as reducing the negative impacts of waste on human health, wildlife, and ecosystems. The abstract of the topic of waste management highlights the importance of proper waste management practices. Inefficient waste management can lead to air and water pollution, soil contamination, and the spread of disease. Therefore, proper waste management practices are essential for maintaining the health and well-being of both people and the environment.

There are various methods of waste management, including landfilling, incineration, composting, and recycling. Each method has its advantages and disadvantages, and the most appropriate method depends on the type and quantity of waste, as well as local regulations and infrastructure. Effective waste management also requires a collaborative effort from individuals, businesses, and governments. This includes implementing waste reduction measures, such as source reduction and reuse, as well as ensuring proper waste segregation and disposal. Additionally, education and awareness campaigns can help to promote responsible waste management practices and reduce the amount of waste generated in the first place. In conclusion, proper waste management is crucial for creating a sustainable and healthy environment. By implementing effective waste management practices, we can minimize the negative impacts of waste on human health and the environment, while also promoting resource efficiency and economic growth. Recycling is the process of converting waste materials into new products, thereby reducing the consumption of raw materials and decreasing the amount of waste sent to landfills. Recycling has become an increasingly important practice in recent years due to concerns about environmental sustainability and resource depletion. The usage of recycling has several benefits. Firstly, it reduces the amount of waste sent to landfills, which helps to reduce the environmental impact of waste disposal. Recycling also conserves natural resources by reducing the need for raw materials and energy-intensive manufacturing processes. This, in turn, helps to reduce greenhouse gas emissions and mitigate climate change. Recycling also has economic benefits. It creates jobs in the recycling industry and generates revenue from the sale of recycled materials. Additionally, it can reduce the cost of waste disposal for businesses and municipalities, leading to cost savings. To maximize the benefits of recycling, it is important to promote recycling education and infrastructure. This includes providing accessible recycling facilities and programs, as well as educating the public on the importance of recycling and proper recycling practices. By doing so, we can create a more sustainable and resource-efficient society.

Keywords: waste management, recycling, sustainable environment, waste raduce

SOIL CONSERVATION ISSUES IN INDIA

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The primary threats to soil conservation are climate change and traditional farming practices, according to the United Nations. Traditional farming practices include the overuse of harmful pesticides that contaminate soils, slash-and-burn methods, and land overuse. Soil compaction (dense soil that drains water very slowly), topsoil removal, and erosion are three key soil problems. Conservation issues are a growing concern for most scientists. As humans continue to consume natural resources, many organisms are headed for extinction. Conservation issues include the protection of trees, animals and wetlands. Much of the soil erosion in India is caused by faulty methods of agriculture.

Wrong ploughing, lack of crop rotation and practice of shifting cultivation are the most adversely affecting methods of agriculture. Ploughing of land along the slopes makes it highly vulnerable to erosion by wind and water. Over irrigation, deforestation due to mining activities, overgrazing and mineral processing are the factors that have lead to land degradation in India. Crop rotation, cover crops, conservation tillage, and installed windbreaks are methods for better soil conservation that have an impact on both erosions as well as fertility. Soil conservation is proven to increase the quality and quantity of crop yields over the long term because it keeps topsoil in its place and preserves the long term productivity of the soil. To grow enough food not only for ourselves; but also for people in third world countries where there are food shortages.

Keywords: Conservation, Deforestation, Pesticide, Contaminate, Ploughing

A STUDY ON THE CYBER-CRIME AND CYBER CRIMINAL

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Today, Cybercrime has caused lot of damages to individuals, organizations and even the Government. Cybercrime detection methods and classification methods have come up with varying levels of success for preventing and protecting data from such attacks. Several laws and methods have been introduced in order to prevent cybercrime and the penalties are laid down to the criminals. However, the study shows that there are many countries facing this problem even today and United States of America is leading with maximum damage due to the cybercrimes over the years. According to the recent survey carried out it was noticed that year 2013 saw the monetary damage of nearly 781.84 million U.S. dollars. This paper describes about the common areas where cybercrime usually occurs and the different types of cybercrimes that are committed today. The paper also shows the studies made on email related crimes as email is the most common medium through which the cybercrimes occur. In addition, some of the case studies related to cybercrimes are also laid down.

Keywords: financial crimes, cyber stalking, telecommunication frauds, e-mail related crimes, cyber criminals, email spoofing, email bombing.

CYBER CRIMES AND CYBER SECURITY

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The world has become more advanced in communication, especially after the invention of the Internet. A key issue facing today's society is the increase in cybercrime or e-crimes (electronic crimes), another term for cybercrime. Thus, e-crimes pose threats to nations, organizations and individuals across the globe. It has become widespread in many parts of the world and millions of people are victims of e-crimes. Given the serious nature of e-crimes, its global nature and implications, it is clear that there is a crucial need for a common understanding of such criminal activity internationally to deal with it effectively. This research covers the definitions, types, and intrusions of e-crimes. It has also focused on the laws against e-crimes in different countries. Cybersecurity and searching methods to get secured are also part of the study. Keywords: Machine Learning, Mac

Keywords: Cybercrime, e-crime, cyber security, computers, internet, social media, cyber laws, Machine Learning Algorithms, Artificial Intelligence, Big Data.

EFFECT OF IOT DEVICE IN MORDEN SOCIATY

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One of the buzzwords in the Information Technology is Internet of Things (IoT). The future is Internet of Things, which will transform the real world objects into intelligent virtual objects. The IoT aims to unify everything in our world under a common infrastructure, giving us not only control of things around us, but also keeping us informed of the state of the things. In Light of this, present study addresses IoT concepts through systematic review of scholarly research papers, corporate white papers, professional discussions with experts and online databases. Moreover this research article focuses on definitions, basic requirements, characteristics.

Keywords: Internet of Things, IoT, RFID, IPv6, EPC, Barcode, Wi-Fi, Bluetooth, NFC, ZigBee, Sensors,

NEXUS OF POLITICS WITH CRIMINALIZED IN INDIA

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The constitution of India sets democratic, parliamentary form of government and dual polity, at Union and States, as hallmark of the Indian political system. Houses to the legislatures are bicameral, of Union and six State Legislatures. Members of both houses are elected by and amongst the people. Periodic election to the house of people and legislative assembly is direct while for other house (Council of States and Legislative Councils) is indirect. So far as policy making is concerned, both houses hold equal capacities, except in few matters. Democracy makes these elected representatives accountable towards the people. Democracy demands these elections free and fair, cleanness of candidates are concomitant to it. Globalization demands justice to the last person ensuring good governance. It is possible through deep representation only. This paper analyzes causes for criminalization of Indian politics and the means to dislodge it to maintain real democracy through real representation. This paper includes doctrinal research methodology engaging primary and secondary sources.

Keywords: free and fair, elections democracy, criminal

EFFECT OF IOT IN SCHOOL EDUCATION IN INDIA

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Currently smart education systems make efficient use of internet technology that takes advantage of the Internet of Things. Cloud Computing Technologies Increase Battery Life of Internet of Things Nodes To track and act upon multiple education system components the system needs to provide access to the nodes and gateways. Only new wireless and wired technologies allow to provide a proper communication but like other areas converged intelligent cultures Education sector is not an exception Internet of things confirms its importance Information and communication and technology and social development sector role in too much equipment education is associated with The campus leader is able to continuously get more gems Care for data and education A short time centric environment Smart campuses help in taking the collective smart environment to greater heights Strategy for educational institutions to achieve full output Permits and promotes sustainability New paper published in the Magazine book and online by reviewing a good amount of data second grandfather source study the main sadness is to explain the use of internet of thinks in the development of smart education system.

Keyword: Cloud Computing, wireless and wired, Smart Campouses.

PROTECTION OF WOMEN FROM SEXUAL HARASSMENT AT WORKPLACE

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Women contribute half of the world population in the world so as in India. Due to certain persisting evils in the society, women face numerous offences in every span of their life. Such abusive protection got more rigid against them at workplace. To protect women from such violence, UN has come up with CEBAU in 1979 to which India has been signatory along with others democracies in the world. India legislation has been reluctant to give legal color to its commitment to the UN. However the India Supreme Court has headed onto it in an PIL named Vishakha Vs state of Rajasthan AIR 1996 Supreme Court and reminding to the Indian Government laid down guidelines filling the legislative gap, for the protection of women from sexual harassment at workplace. Since then, these guidelines had been law on the issue. Until the parliament enacted the "Protection of women from domestic violence (amendment) act 2012". In spite of these guidelines and laws, there had been little change in the patriarchal society and protection of women at workplace. In this research paper various causes have been investigated which are responsible for causing threat to the women safety at workplace. The universes of this research are Ambikapur located public and private workplaces.

Keywords: Democracy, Violence, Harassment, Protection, Patriarchal, Society

A CUTTING-EDGE AND SAFE SYSTEM FOR EMPLOYING BLOCKCHAIN TECHNOLOGY FOR ONLINE EXAMS

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Several educational institutions now administer exams to students, notably those in secondary and higher education, using online platforms. The most well-known online test software works by giving candidates a user id and password, after which they log in to the specified web page to answer the questions. Unfortunately, this method contains several vulnerabilities, making it possible for test cheating to occur when the password is abused. This demonstrates the need of implementing a safe system to prevent such an issue. A blockchain architecture for securing the online test system is presented in this research. An educational data management system that interfaces to the proposed framework has been secured. Without needing a copy from the central servers, institutions may easily build their historical data. The suggested blockchain structure enhances data security and eliminates any opportunity for user or outside institution fraud while accessing apps and services. In order to guarantee consistency between the student and the server as well as safe transmission of the questionnaire from the server, this study offers a secure framework for performing and assessing topic tests.

Keywords: Blockchain; Education; Consensus; Decentralization; Transparency.

A STUDY ON TRIBAL WOMEN'S AWARENESS ABOUT GOVERNMENT AND NON-GOVERNMENT DEVELOPMENT PROGRAMS/SCHEMES WITH SPECIAL REFERENCE TO SARGUJA DIVISION

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Since India is a developing nation, its 10th five-year plan has prioritised growth that benefits everyone. By including everyone who is currently outside of a country's mainstream development, or marginalised group, the country's overall development will increase.

In the Indian economy, a woman and her tribe hold the reins of power, but she is overwhelmed by the responsibility. The government and non-profits are working to increase her self-assurance so that she can take advantage of the opportunities available to her. This research mostly focuses on describing existing patterns. 350 respondents participated in the survey. Information from the primary sources was gathered by Through the use of questionnaires, primary data is gathered from the participants. Finally, the analysis concludes with recommendations for future study of the most pressing problems facing women and nongovernmental organisations (NGOs).

Keywords: Women, Tribal women, awareness, Government schemes, non-Government development schemes

SPILOVERS BETWEEN SOVEREIGN RISK AND BANKING INDUSTRY

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With the sharp rise in sovereign default risk of many countries in the world, measuring sovereign credit risk and searching for the potential determinants of default sovereign risk become of great importance. It is not surprising that a growing body of literature continues to look for drivers that interact to shape investor views of sovereign creditworthiness.

This article consider fragility in the banking industry as an important driver of sovereign risk and the interconnectedness sovereign vs bank risk and the channels of transmission.

Keywords: Sovereign risk, CDS, spillovers sovereign & banking industry, panel data.

A GROUNDED THEORY OF ABSTRACTION IN ARTIFICIAL INTELLIGENCE

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In artificial intelligence, abstraction is commonly used to account for the use of various levels of details in a given representation language or the ability to change from one level to another while preserving useful properties. Abstraction has been mainly studied in problem solving, theorem proving, knowledge representation (in particular for spatial and temporal reasoning) and machine learning. In such contexts, abstraction is defined as a mapping between formalisms that reduces the computational complexity of the task at stake. By analysing the notion of abstraction from an information quantity point of view, we pinpoint the differences and the complementary role of reformulation and abstraction in any representation change. We contribute to extending the existing semantic theories of abstraction to be grounded on perception, where the notion of information quantity is easier to characterize formally. In the author's view, abstraction is best represented using abstraction operators, as they provide semantics for classifying different abstractions and support the automation of representation changes. The usefulness of a grounded theory of abstraction in the cartography domain is illustrated. Finally, the importance of explicitly representing abstraction for designing more autonomous and adaptive systems is discussed

Keywords: Artificial Intelligence, Machine Learning, Adaptive System.

INFLUENCE OF WILDFIRE ON BIOMASS, CARBON STORAGE AND SEQUESTRATION OF TROPICAL DECIDUOUS FOREST IN CHHATTISGARH

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Wildfire is a common phenomenon across the globe, especially in tropical countries. In India, a forest fire is the most common and devastating event that causes enormous losses and changes in the various components of the forest ecosystem. The present investigation explored the impact of wildfires on forest structure, diversity, biomass, carbon stock, carbon sequestration, productivity, soil attributes, and soil microbial biomass carbon in different sites. The fire may be harmful or beneficial depending upon the fire's return interval, severity, and intensity. The forest fire is called a "*good servant but a bad master*". Four sites viz., no fire zone (NFZ), low fire zone (LFZ), medium fire zone (MFZ), and high fire zone (HFZ) were classified based on the historical data on the forest fire in Boramdeo Wildlife Sanctuary. The present forest reflects a non-linear inverse relationship between density vs. girth showing a small structure. The tree density across the fire regimes varied from 380-880 trees ha⁻¹ least in HFZ and highest in the NFZ. The total biomass for the tree, shrubs, herbs, fine roots, and litter mass ranged from 116.03-358.36 t ha⁻¹, 6.82-15.71 t ha⁻¹, 0.37-0.88 t ha⁻¹, 6.58-19.16 t ha⁻¹, and 2.0-3.65 t ha⁻¹, respectively. Total carbon storage across sites varied from 59.07 to 169.51 t C ha⁻¹. The seasonal mean forest floor biomass and litterfall under different fire regimes varied from 2.0-3.65 t ha⁻¹ and 4.75-7.56 t ha⁻¹ yr⁻¹, respectively. The turnover of litter and time varied from 1.35-1.43 years, and 70-74%, respectively. The total vegetation production varied from 17.89–38.13 t ha⁻¹yr⁻¹ among the different fire zone. The total C sequestration ranged between 7.08 and 15.95 t ha⁻¹yr⁻¹. The carbon stored by soil in 0-10 cm soil was 24.36-42.46 t ha⁻¹ whereas in 10-20 cm soil depth it was 13.14-27.05 t ha⁻¹. Sandy loam soil texture was found for all the sites except for the LFZ which revealed loamy soil. The bulk density ranged from 1.15-1.36 g cm⁻³ for surface soil and

1.18 to 1.38 g cm⁻³ for subsurface soil in different sites. Organic carbon, N, P, K, pH, soil moisture, and organic matter were more in NFZ as compared to other study sites. The seasonal values of soil microbial biomass carbon across the fire regimes at both soil depths varied significantly concerning site, soil depth, and season. The maximum values were measured in the summer season and the minimum in the rainy season at both soil depths. Among the different fire regimes, HFZ faces much of deleterious effects on composition, structure, regeneration, biomass, net primary productivity, carbon storage, C sequestration, soil microbial biomass as well as soil physicochemical properties. Control of such types of wildfire and anthropogenic ignition is required for the conservation of floral and faunal diversity.

Keywords: Biomass, carbon stock, carbon sequestration, fire regimes, productivity

DEFORESTATION AND CLIMATE CHANGE AFFECTS ON ENVIRONMENT

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Deforestation refers to the purposeful clearing or thinning of trees and forests. When deforestation occurs, much of the carbon stored by trees is released back into the atmosphere as carbon dioxide, which contributes to climate change. Deforestation is a primary contributor to climate change, and climate change affects forests. Land use changes, especially in the form of deforestation, are the second largest anthropogenic source of atmospheric carbon dioxide emissions, after fossil fuel combustion. Deforestation comes in many forms: wildfire, agricultural clearcutting, livestock ranching, and logging for timber, among others. The vast majority of agricultural activity resulting in deforestation is subsidized by government tax revenue. Forests store large amounts of carbon. Trees and other plants absorb carbon dioxide from the atmosphere as they grow. This is converted into carbon and stored in the plant's branches, leaves, trunks, roots and in the soil. When we clear forests, we're not only knocking out our best ally in capturing the staggering amount of GHGs we humans create (which we do primarily by burning fossil fuels at energy facilities, and of course, in cars, planes, and trains). We're also creating emissions by cutting down trees: when trees are felled, they release into the atmosphere all the carbon they've been storing. What the deforesters do with the felled trees—either leaving them to rot on the forest floor or burning them—creates further emissions. All told, deforestation on its own causes about 10 percent of worldwide emissions.

Deforestation causes carbon dioxide to linger in the atmosphere. As carbon dioxide accrues, it produces a layer in the atmosphere that traps radiation from the sun. The radiation converts to heat which causes global warming, which is better known as the greenhouse effect. As uncontrolled deforestation carries on carbon is released as carbon dioxide and traps heat in atmosphere. This will then cause global warming. Thus, it can be concluded that deforestation can change in the climate due to internal heating of earth. Moreover, deforestation can lead to change of weather patterns.

Averaged over all land and ocean surfaces, temperatures warmed roughly 1 °C (1.8 °F) between 1880 and 2020, according to the Intergovernmental Panel on Climate Change.

Keywords: deforestation, global warming, intergovernmental, green house effect.

ECOLOGICAL FOOTPRINT: A TOOL FOR MEASURING SUSTAINABLE DEVELOPMENT

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The ecological footprint is a measure of human demand on the Earth's ecosystems. It is a standardized measure of demand for natural capital that may be contrasted with the planet's ecological capacity to regenerate. It represents the amount of biologically productive land and sea area necessary to supply the resources a human population consumes, and to assimilate associated waste. How is an Ecological Footprint calculated. In 2007, the average biologically productive area per person worldwide was approximately 1.8 global hectares (gha) per capita. The U.S. footprint per capita was 9.0 gha, and that of Switzerland was 5.6 gha, while China's was 1.8 gha. The WWF claims that the human footprint has exceeded the biocapacity (the available supply of natural resources) of the planet by 20% . Applicability of Ecological Footprint Per capita EFs show a wide divergence in the demands on nature from people in different societies, ranging from Qatar at the high end (15.5 gha/person) to Haiti at the low end (0.7), with the United States (8.4), Germany (5.1), China (3.7), and others in between (2014 data). These figures are the basis of claims such that if all of humanity consumed like the average American, about five Earths would be needed. EFs also vary greatly within countries according to level of affluence.

Keywords: ecological footprint, earth ecosystems, global ecosystem, worldwide ecosystem,

NATURAL DISASTER MANAGEMENT FOR NATURAL HAZARD

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Natural disaster is the consequence when a natural hazard (e.g., volcanic eruption or earthquake) affects humans. Human vulnerability, caused by the lack of appropriate emergency management, leads to financial, environmental, or human impact. The resulting loss depends on the capacity of the population to support or resist the disaster: their resilience. This understanding is concentrated in the formulation: "disasters occur when hazards meet vulnerability". A natural hazard will hence never result in a natural disaster in areas without vulnerability, e.g., strong earthquakes in uninhabited areas. The term natural has consequently been disputed because the events simply are not hazards or disasters without human involvement. Types of Natural Disaster, Tsunamis, Earthquakes, Volcanoes, Landslides, Floods, Droughts, Forest fires, Hurricanes, Thunderstorms, Tornadoes, Winter storms, Heat Waves, Special Marine, Space Weather. Aspects of Disaster Management. The International Federation of Red Cross & Red Crescent Societies defines disaster management as the organisation and management of resources and responsibilities for dealing with all the humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of disasters. Some Assam faced devastating floods in 2022 but large parts of it was stricken with drought. It took just a week for the situation to change from drought to deluge, a classic case of how climate change is exacerbating extreme weather events. The northeastern Brazilian states of Pernambuco, Alagoas, and Paraíba were hit by heavy rainfall over several days beginning around May 23, 2022. It resulted in landslides and flooding, causing the worst natural disaster to hit the Pernambuco region this century. The third-quarter Aon report focused on three of the most consequential disasters of 2022: Florida's Hurricane Ian, the summer drought and heat waves in Europe, and monsoon flooding in Pakistan.

Keywords: Natural disaster, effect of natural disaster, human impact, environmental,

THREATS TO FOREST RESOURCES

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The different types of resources like Wood, Timber, bushmeat, medicines etc., provided by forests are termed forest resources. A forest is a dense growth of trees and other plants covering a significant amount of land. It is an ecosystem, a community of plants and animals interacting with one another and their environment. Forestry is the science involved in studying, preserving, and managing forests. Forests are among the most biodiverse and valuable terrestrial ecosystems on the planet. However, maintaining forests and their biodiversity is both complex and sensitive, and natural and human impacts on forest ecosystems is making this increasingly difficult. During the lifetime of forest stands they are subject to many different factors that can potentially threaten their very existence. Abiotic factors such as windthrow and fires can devastate forests while biotic factors such as insect pests, diseases and animal damage can seriously affect their health and productivity. The protection of forests is therefore one of the key objectives of forest management in order to maintain the sustainability of the forest resource. This section outlines the common threats that impact on Ireland's forests and the measures that are taken to avoid them.

Keywords: forest resources, disaster, threats, natural impacts,

AIR POLLUTION MONITORING AND ASSESSMENT

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Air pollution monitoring and assessment are essential practices that help to identify and mitigate the harmful effects of air pollution on human health and the environment. These practices involve the use of a variety of methods, including air quality monitoring networks, remote sensing technologies, and modelling tools to measure and analyse the concentration and distribution of air pollutants. Air pollution monitoring and assessment can help to inform public health policies and strategies to reduce the impact of air pollution on vulnerable populations.

However, the effectiveness of air pollution monitoring and assessment is dependent on the availability of accurate and reliable data, adequate funding, and effective communication and collaboration among stakeholders. Addressing these challenges requires a comprehensive approach that includes the development of advanced technologies, improved data collection and analysis methods, and effective communication and education campaigns. This abstract provides an overview of the importance of air pollution monitoring and assessment, the challenges faced by the sector, and the need for collaborative efforts to develop innovative solutions to mitigate the impact of air pollution on human health and the environment.

Keywords: air pollution, environment, pollution, human health,

SOIL CONSERVATION IN SUSTAINABLE AGRICULTURE

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Soil conservation refers to the practices and techniques used to protect and preserve soil from erosion, degradation, and depletion. It involves the management of soil and its resources in a sustainable manner to maintain its productivity and fertility. Soil conservation methods can include measures such as terracing, contour ploughing, crop rotation, cover cropping, and conservation tillage. These methods help to reduce soil erosion, improve water retention and infiltration, and prevent soil compaction. Conserving soil is crucial for maintaining healthy and productive agricultural land, as well as preserving natural ecosystems. The loss of fertile soil can lead to reduced crop yields, increased water runoff and flooding, and decreased biodiversity.

Effective soil conservation requires a combination of education, research, and the adoption of sustainable agricultural practices. Governments, farmers, and land managers all have a role to play in ensuring that soil resources are used responsibly and protected for future generations. Soil conservation is a critical aspect of sustainable land management, as it helps to prevent soil erosion and degradation, maintain soil fertility, and preserve the long-term productivity of agricultural lands. Soil erosion is a significant problem that affects millions of hectares of land worldwide, leading to reduced crop yields, increased water pollution, and the loss of valuable topsoil. Soil conservation practices can help to mitigate these negative impacts by promoting the health and resilience of soil ecosystems. This paper provides an in-depth overview of current soil conservation practices, including contour farming, conservation tillage, and cover cropping, as well as emerging technologies such as precision agriculture and soil sensors. Contour farming involves planting crops along the natural contours of the land to slow down the flow of water and prevent soil erosion.

Conservation tillage is a farming practice that minimizes soil disturbance by leaving crop residue on the soil surface, which helps to protect the soil from wind and water erosion. Cover cropping involves planting crops between cash crops to improve soil health and fertility. The benefits of soil conservation are discussed, including improved crop yields, reduced water pollution, and increased resilience to climate change. Soil conservation practices can also help to reduce the need for synthetic fertilizers and pesticides, which can have negative impacts on human health and the environment. Additionally, soil conservation practices can help to promote biodiversity by creating habitat for beneficial insects and other organisms. However, the challenges and limitations of soil conservation are also explored, such as the need for greater adoption by farmers and the potential trade-offs between conservation practices and economic profitability. Farmers may be hesitant to adopt soil conservation practices if they perceive them as too costly or time-consuming, or if they are not aware of the benefits. Additionally, some conservation practices may require significant upfront investment, such as the purchase of specialized equipment or the installation of terraces or other erosion control structures. Overall, this paper highlights the importance of soil conservation as a key component of sustainable agriculture and land management.

Keywords: Soil conservation, degradation, crop rotation

IN-SILICO DOCKING ANALYSIS OF NATURAL ANTI-BIOFILM AGENTS AGAINST QUORUM SENSING RESPONSE REGULATORS OF PSEUDOMONAS AERUGINOSA

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The multidrug resistance (MDR) issue has risen substantially in recent years and is considered a global threat. Therefore, some alternative compounds should be unearthed immediately to develop novel strategies to address the issues related to *P. aeruginosa* drug resistance for which *LasR*, *LasI*, and *RhlR*, *RhlI* could be potential candidates. Seven natural anti-biofilm/ quorum sensing inhibiting compounds were retrieved from various literature with significant inhibitory effects against *P. aeruginosa* biofilm in *in-vitro* experiments. Compounds were filtered on the parameters of Lipinski's rule, ADME, and drug likeliness. The screened and standard drugs were docked against *LasR*, *LasI*, and *RhlR*, *RhlI* using AutoDock 4.2 tool. A potential anti-biofilm natural compound Andrograpanin was selected based on filtered parameters and high binding affinity towards all studied QS receptors.

Keywords: *Pseudomonas aeruginosa*, Biofilm, ligand, β -lactamase, quorum sensing.

ETHNOZOOLOGICAL PRACTICES AMONG ORAON TRIBES OF CHHATTISGARH- A CASE STUDY

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The increasing global population has confirmed that the food security problem will be very challenging in the next decade, and we are not equipped to deal with it. Promoting insect/ worm cultivation by various stakeholders of society may draw consumer attention and act as an essential tool to deal with food security problems. The proposed study is an attempt to document the medicinally important insects/worms traditionally consumed by the tribal communities of Sarguja, Chhattisgarh, India. The outcome of the study may make modern-day consumers accept these ancient folk practices of eating insects/ worms for various ailments and farm insects/worms as nutritious food sources. This ethnozoological survey will report on folk practices of the indigenous tribal population of Sarguja, Chhattisgarh and will prevent the gradual loss of traditional culture that constitute the legacy of the Oraon tribal healthcare system. The farming of the most cited insects/worms will create self-employment opportunities for the tribes and local people. The sustainable applications of these insects/worms conserve local therapeutic knowledge.

Keywords: Ethnozoology, Medicinal worms, Oraon tribes

DOMESTIC VIOLENCE WITH RESPECT TO WOMEN

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Domestic violence is a pattern of behavior in a relationship of spouse which is abusive in nature ,used by one partner over the other .It may be physical ,sexual ,emotional, economical ,psychological, coercive behavior .Peculiarity of this crime is that it is not affect to the party only but to the children ,family ,friends also .Although many campaign, reformative scheme initiated and performed by various social reformers for protection and promotion of rights related to women ,honorable courts and law making bodies contributed by interpreting the law in their judgement and law making bodies by enacting the law for their betterment as DOMESTIC VIOLENCE ACT 2005 .Although the implementation of the act have many challenges at ground level .lack of awareness, financial dependency ,societal mindset etc are the main reason behind it . There is need to understand the women are normal and similar creation of God as men so no need to judge them as one's own understanding. The only requirement is to understand their rights and perform our duty towards them.

Keywords: DOMESTIC VIOLENCE, ABUSIVE CAMPAIGN.

EFFECT OF ALTITUDE ON VEGETATION DYNAMICS IN RAMGARH HILL OF NORTHERN CHHATTISGARH

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The present work assesses the effect of altitude on vegetation dynamics in Ramgarh Hill of Northern Chhattisgarh. Three sites i.e., hill-top, mid-hill, and hill-base of Ramgarh were selected for assessment of various attributes. The silent findings of the study reflected that in different sites, a total of 32 tree species with 18 families, 22 sapling species with 16 families, 11 seedling species with 8 families, 7 shrub species with 7 families, 2 climber species with 2 families, 9 herb species with 8 families were recorded. The total density of trees, saplings, seedlings, shrubs, climbers, and herbs ranged from 1150-2160 trees ha⁻¹, 530-610 saplings ha⁻¹, 360-410 seedlings ha⁻¹, 400-4280 shrub ha⁻¹, 0-1280 climber ha⁻¹ and 544000-992000 herb ha⁻¹, respectively. The value of the Shannon index for trees, saplings, seedlings, shrubs, climbers, and herbs ranged from 3-3.91, 1.90-3.59, 1.66-2.55, 0-1.77, up to 0.85, and 0.88-1.92, respectively in different sites. The total forest floor biomass ranged from 2.60-2.81 t ha⁻¹ in different sites. The regeneration status of the species in different sites reflects that good regeneration was found in the mid-hill (40.91%) site followed by the hill-base (26.67%) and least in the hill-top (20%) site. The forest of the present study sites exhibits a substantial population of diverse vegetation in various stratified layers. The phytosociological attributes of the various stands vary as per the altitudinal gradient which reflects that these gradients have a significant impact on the vegetation ecology and their diversity along with the forest soil nutrient reserve. These sites need to be protected and conserved from biotic factors so that the degeneration of this site can be halted in due course of time and can enhance the biodiversity of the region.

Keywords: Altitude, diversity, forest floor biomass, regeneration, vegetation dynamics

FLORISTIC STRUCTURE AND DIVERSITY IN DIFFERENT FOREST STANDS IN NORTHERN CHHATTISGARH

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The floristic structure and diversity of different forest stands (dense forest, moderately dense forest, regenerated forest, degraded forest, and teak plantation) in Northern Chhattisgarh were done to determine the influence of disturbance on vegetation. A total of 21, 25, 23, 14, 17, and 30 species were recorded for tree, sapling, seedling, shrub, climber, and herb, respectively across different sites in Northern Chhattisgarh. The forest of the Duldula region, northern Chhattisgarh exhibits substantial diversity of trees, saplings, seedlings, shrubs, climbers, herbs species, and soil attributes. The quantitative attributes of the vegetation, forest floor biomass, and soil physicochemical analysis vary among different sites, stratum, and depths. The disturbed site among natural stand and teak plantation reflects lower values in terms of phytosociological attributes, litter biomass, and soil macro and micro-nutrient status as compared to the other study sites. This scenario reflects that the disturbance harms the vegetation ecology, diversity, and nutrient pool of the stands. The degraded forest needs to be protected, conserved, and managed properly to improve the regeneration and establishment of the species which have good regeneration potential in this site. This will lead to restoring the site in terms of vegetation dynamics, and biodiversity of the region as well improve the soil health in due course of time. In rest of the site needs to manage the population dynamics of economic species to improve productivity in terms of economic return and gain.

Keywords: Diversity, micro-nutrients, phytosociology, structure

IMPACT OF BIOMEDICAL WASTES ON ENVIRONMENTAL PROTECTION: INDIAN PERSPECTIVES

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Biomedical wastes are different from other forms of wastes. So, its management and disposal requires differentiated methodologies than other. The development of medical wastes, the majority of whose components are reportedly infectious, has increased as a result of population growth and greater access to healthcare services. Hospitals, dentist offices, clinics, clinical laboratories, and other facilities providing healthcare are among the facilities that produce medical waste. In an unreliable manner, hospitals and nursing homes produce a rising amount of biomedical waste. Governments around the world are battling to develop policies and infrastructure for proper disposal of the rising amount of medical waste continuously generated from hospitals, pathologies and health centers. As a result, these organizations' subpar waste disposal techniques expose the public to health risks and actual environmental issues. To build improved management procedures and processes, a thorough study of the issue of biomedical waste identification, treatment, and disposal is required. This study's objective was to assess India's medical waste management practices as a developing nation and to compare them to those in the region. This study looks at the knowledge that is currently available and the practices that are currently being used in managing medical and healthcare waste in India. It also looks at how the generation rate of medical waste is affected by various socioeconomic and environmental factors.

Keywords: Biomedical wastes, healthcare services, public health risks, environmental risks, management medical and healthcare waste

RENEWABLE ENERGIES AS A SOLUTION TO CLIMATE CHANGE

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Renewable energies are an indispensable part of today's energy landscape. While until the beginning of this century they were still models of power generation that could never completely shed their experimental character, renewable technologies have become increasingly important in the 2000 s and are now an urgently needed force for our future. At the moment, we rely mainly on fossil energy sources such as oil, coal and gas, releasing CO² from the ground, which produces greenhouse gases and drives global warming. If we want to stop climate change, we need to switch to renewable or regenerative energy sources as soon as possible.

Keywords: Renewable energies indispensable part power experimental, increasingly important urgently fossil energy sources greenhouse gases oil coal and gas CO² from the ground.

SURFACE WATER QUALITY AND IT'S ASSESSMENT

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Assessment of water quality can be defined as the analysis of physical, chemical and biological characteristics of water. Water quality indices aim at giving a single value to the water quality of a source reducing great amount of parameters into a simpler expression and enabling easy interpretation of monitoring data. In this study, various water quality indices (WQI) used for assessing surface water quality are discussed. As different National and International Agencies involved in water quality assessment and pollution control defines water quality criteria for different uses of water considering different indicator parameters, so there are numerous WQI specific to any region or area. This environmetric study deals with the interpretation of river water monitoring data from the basin of the Buyuk Menderes River and its tributaries in Turkey. Eleven variables were measured to estimate water quality at 17 sampling sites. Factor analysis was applied to explain the correlations between the observations in terms of underlying factors. Results revealed that, water quality was strongly affected from agricultural uses.

Keywords : Surface water quality, parameters, water quality index, sub-indices, aggregation

SINGLE-VALUED NEUTROSOPHIC MEASURES OF COMPARISON WITH APPLICATION TO CLASSIFICATION PROBLEM

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Single-valued neutrosophic sets (SVNSs) is a mathematical concept that is used for handling uncertain and intermediate problems. In SVN environment, various information measures such as distance measure, entropy measure, similarity measure and, divergence measure have been applied in many applications such as pattern recognition, multi-criteria decision making (MCDM), medical diagnosis and clustering problems. In this paper, we propose a new divergence measures using aggregation operators with its validity evidence. We also discuss some properties. Finally, we apply the proposed divergence measures to pattern recognition and justify its advantages.

Keywords: Single-valued neutrosophic, divergence measure, aggregation operators, pattern recognition.

HUMAN RIGHTS OF PRISONERS IN INDIA

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No prisoner can be deprived by his fundamental right .They can't be treated with inhumanity ,cruelty and with disrespect. Being a prisoner ,he has already served the prison for his wrong deed. Any additional punishment against violation of his human right should not be imposed on him, because he is also a human being by birth therefore he has right to claim his human right as any other person. He has the right to access medical assistance ,clean drinking water, food, clothes and those basic necessity which are necessary for survival. Article 32 and Article 226 provide safeguard for the protection of heir human right violation. Prison act 1894 is specific act on right and duty of prisoners. The object behind that to reform the prisoner so we should provide an opportunity for the same. Under Delhi Prison act 2002 provide more power to the under trial prisoners than the prisoner who awarded sentenced. No one can take away fundamental right of other. Father of our nation. As the famous quote given by mahatma Gandhi states that "hate the crime not the criminal "

Keywords: disciplinary, contemporary, colonial, hatred, punishable

ASSESSMENT OF ENVIRONMENTAL AWARENESS AMONG SECONDARY SCHOOL STUDENTS OF SARGUJA, CHHATTISGARH

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The term "environment" alludes to the surroundings of every aspect of life, but it is especially relevant when discussing people. The environmental education incorporates both inorganic and biological elements and is profoundly linked to nature. Animals, vegetation, birds, and microbes are examples of organic materials. We're blessed with water, air, minerals, soil, and other inorganic substances. Environmental degradation, the result of careless use of earth's resources, unrelenting population growth, uncontrolled industrialization, unrestrained urbanization, and improper application of science and technology, has led to the impending environmental catastrophe. The public/Students must be made aware of the damage to the environment that is occurring and that will place every living thing of life in peril in order to prevent further harm to the ecosystem. This can be done by educating the populace about the problem.

The study's goals were to identify any notable variations in secondary school pupils' environmental awareness and attitudes. As a consequence, it is clear that there is a huge need for orientation and training programs to help secondary school students develop a more positive attitude toward the environment. Similar to this, the government must work to include environmental education-related material in high school curricula.

Keywords: Environment, Biological Elements, Resources, Environmental Catastrophe, Environmental awareness.

ASSESSMENT OF AGRICULTURAL PESTICIDES USE PATTERN OF RELATED CROPFIELDS OF SITAPUR, SARGUJA, CHHATTISGARH

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Since the start of the Green Revolution, farming output of food and other products has increased significantly in India. Along with high-yielding types, greater watering, and aeration, pesticides have contributed to some of this development. From 10,993 metric tons in the middle of the 1960s to about 80,000 metric tons in the 1990s, pesticide use grew. This resilience, not environmental worries, was the driving force behind the development of IPM. It has been noted that pesticides doses are becoming more and more associated with immune system reduction, hormone disturbance, lowered intellect, anomalies in reproduction, and cancer. India currently places 12th in the globe for pesticide use. In India, the bulks of people works in farmland and are therefore subjected to the chemicals used in that industry. Despite having a much lower typical pesticide usage than many other industrialized nations, India has a serious pesticide residue issue. The sale of farm products has recently been impacted by pesticide residue in a number of crops. In this context, some of the important tactics for reducing human exposure to pesticides include pesticide safety, control of pesticide use, appropriate delivery methods, and integrated pest management. In India, there are not many research that address these problems.

Therefore, the main goal of this study was to gather data from farmers regarding the use of pesticides at the site of the study and to suggest future plans for responsible utilization of pesticides and the minimization of environmental and public health issues.

Keywords: Pesticides, Green Revolution, Integrated Pest Management (IPM), Public Health, Pesticide Residue.

PROBIOTICS: A FAVORABLE ALTERNATIVE FOR PREVENTIVE INTERVENTION OF TYPE-2 DIABETES

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In the present scenario diabetes is one of the leading causes of death worldwide. As per WHO's Newsroom Fact Sheets Detail on The Top 10 causes of death (Geneva, Switzerland, 2018) report, approximately 422 million people worldwide are suffering from this disease. The much-affected people from diabetes reside in developing and underdeveloped countries. Out of the two variants of diabetes, viz Type-1-Diabetes Mellitus (T1DM) and Type-2-Diabetes Mellitus (T2DM), the latter is more prevalent throughout the globe. The disease is multifaceted as it has a firm genetic basis as well as various influencing environmental factors including mainly the lifestyle and diet. The therapeutic strategies being employed presently mainly targets the outcomes of the disease rather than treating the root cause. The insufficiency and the inefficacy of the now used therapies results in many health issues and high mortality. Recently, the scientific community has started to envision the role of probiotics in therapies. There are several hundreds of microbial species within the gut, constituting millions of genes; the gut microbiome may itself act as an organ and may control the energetic as well as immune response of the host. With this assertion researchers have now started working on role of probiotics and gut-micro flora in treatment of metabolic disorders including diabetes. This review mainly emphasizes on examining the prevalence and severity of T2DM and the effectiveness of probiotics in treatment of T2DM.

Keywords: Diabetes, Metabolic, Disorder Probiotics

AN IOT AND CLOUD-BASED REAL-TIME SMART FIRE DETECTION AND MONITORING SYSTEM USING A BOLT IOT KIT AND SENSORS

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The Internet of Things (IoT) is an emerging paradigm that has brought about a transformation in people's ways of living, moving from traditional to modern high-tech. The emergence of this technology has led to various alterations, such as intelligent cities and residences, as well as the mitigation of environmental pollution. The areas of focus related to energy-efficient practices and technology include management, conservation of energy, intelligent transportation, and industries. Several significant research projects and investigations have been carried out in order to advance technology using IoT. By taking a practical approach to automated fire detection systems, research gaps will be filled. The Bolt IoT platform and sensor LM35 deserve credit for that. Data obtained from sensors and gathered by Bolt IoT By comparing the temperature and humidity threshold values with the fire or pollution detection, Bolt Cloud can inform users by alarm and by showing an alert message. The aim of this paper is to help readers and researchers gain a better understanding of the Internet of Things (IoT) and its functionalities offline as well as online. Everything is automated and accessible from any location. Additionally, it demonstrates how the Internet of Things is the revolutionary strategy for upcoming scientific and technical advancements.

Keywords: Bolt IoT kit, cloud, detection, ESP8266 WiFi, fire, IoT, LM35 sensor

REMOVAL OF FE [II] BY USING ALBIZIA LEBBECK BARK

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In our present work we study the adsorption potential of Bio adsorbent for removal of Iron [II] ion from wastewater has been studied. We use bark of Albizia Lebbeck for the adsorption. The local name is Sirisa, Siris, lebbeck, koko and women's tongue tree. In our present study we discuss the effect of different experimental condition for the removal of Iron [ii] ion, it involves effect of initial concentration oh bivalent iron ion, different time, different temperature, adsorbent dose, different pH of solution. Langmuir's pseudo second order kinetic equation fit for the equation; Langmuir adsorption isotherm has been used to discuss the adsorption capacity of adsorbent for removal of Fe [II] metal ion. Thermodynamic parameter such as free energy change, enthalpy change has been calculated and discuss and an idea process are spontaneity and feasibility of the adsorption process.

Keywords: Bio-adsorbent, second order kinetics, Lebbeck, thermodynamic parameters

DYNAMIC ANALYSIS OF MULTI STOREY BUILDING WITH PROVISION OF RC SHEAR WALL

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This review paper provides a comprehensive overview of the dynamic analysis of multi-storey buildings with shear walls, which are an effective solution to improve seismic performance and enhance the structural integrity of buildings. The paper examines various research studies on the behaviour of multi-storey buildings with shear walls under seismic loads, including their impact on parameters such as lateral displacement, story drift, base shear, and time period. The benefits of incorporating shear walls in building design and their effectiveness in mitigating the effects of natural disasters are highlighted. The methodology used in this review paper involves the analysis of a symmetrical, 17-story building with the help of STAAD Pro using various models to identify and compute the lateral loads and their vertical distribution on each floor level, using the response spectrum approach to apply these loads.

Keywords: Multi-Storey Building, Shear Wall, Dynamic Analysis, STAAD Pro, Seismic Performance, lateral Displacement, Base Shear.

FOREST MANAGEMENT FOR THE CLIMATE CHANGE MITIGATION AND ENVIRONMENTAL MANAGEMENT

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Forest management is the process of protecting and maintaining a forested area. It often involves evaluating the soil, trees, and vegetation within a forest ecosystem and performing a variety of complex tasks to improve land management practices. Through the proper management one can optimize the output from the forest ecosystems both direct and indirect benefits to the humankind. The forest resources are helpful towards adaptation and mitigation of the climate change and its negative consequences on the human civilization. These forests resource also serves various ecological, economical, traditional values and services and interlinked with the various ecosystem. Besides these, natural forest supports through supply of various products (timber, non-timber forest produces, medicinal products, etc.) and services that contributes to livelihoods of forest dwellers and rural communities. Thus, forest management is essential for obtaining the forest products on sustainable basis to meet the requirements of the people and various forest bases industries. Moreover, forest management has positive impact on the supply system as well as possible solution towards the climate change mitigation and environmental management for sustainable development.

Keywords: Forest management, Habitat, Climate change, Livelihood

WASTE MANAGEMENT: AN OVERVIEW ON SOLID WASTE MANAGEMENT

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Solid management is the basic importance services provided by municipal authorities, NGO, private companies to keep the cities clean. Solid waste management involves the collection, transporting, treatment and disposal of solid waste together with monitoring and regulation. In India environmental problems are introducing in solid waste management because of urbanisation. Solid waste is one of the largest problem of urban area. Solid waste works on basic principle rule are REDUCE, RECYCLE and REUSE. Inappropriate solid waste management causes a hazardous inhabitant. The study of solid waste management has been carried out to evaluate the current status and identify the major problem. Solid waste are treated and dispose by a various method- Incineration, Composting, Landfill, Recycling and Windrow composting. Solid waste are use as a waste energy. Study of solid waste management is modified the present system of solid waste disposal and further use as energy.

Keywords: solid waste, types, method of disposal, problem, scope

A MACHINE-LEARNED MARKOV MODEL TO ESTIMATE STATE TRANSITION RATES FOR ACQUIRED IMMUNODEFICIENCY SYNDROME AND MORTALITY

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Data on states of disease progression in studies that detect biological changes are usually collected at random intervals between infection and disease onset or periodically during follow-up. The levels of CD4 cell decline and the levels of other markers characterize the progression of the human immunodeficiency virus (HIV). The virus penetrates and settles in the host's tissues. The relationship between the factors that influence the change between these two conditions, i.e., I (state-1) = age of HIV attack and P (state-2) = time of onset of acquired immunodeficiency syndrome (AIDS) symptoms, is examined. The difference ($P-I$) between the period of infection (I) and the appearance of the first symptom of the syndrome (P) is the incubation period (IP). This paper aims to formulate a machine-learned Markov model to investigate dependent aspects of the progression of HIV conditions leading to AIDS-related mortality and to predict IP values for a simulated data set. In addition, Chi-square testing of the difference in the two death rates from states 1 (i.e., I) and 2 (i.e., P) to state 3 (i.e., mortality) shows that the death rate from state 2 is significantly different compared to state 1.

Keywords: Incubation Period, HIV/AIDS, Censoring, Survival function, Markov model, transition rates, death rate

POTENTIAL USE OF AGRICULTURE WASTE IN MUSHROOM PRODUCTION IN SARGUJA DISTRICT OF CHHATTISGARH, INDIA.

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The production of mushrooms using agricultural waste as a substrate is gaining significant attention due to its numerous benefits. Agro-industrial waste, such as paddy straw, wheat straw, cellulosic waste, and leftovers, can be managed and bio-conserved by growing edible fungi. Only 0.03% of all agricultural waste is used to produce mushrooms, according to reports, so if we used 1% of this waste, we could produce 30 million tonnes of mushrooms, which is roughly equal to the current global supply. However, only 3% (120,000 tonnes) of the world's total mushroom production is reported to be produced in India, which is still relatively low compared to other countries. In addition, conventional farming techniques are used, which result in low yields because the crops are susceptible to several illnesses and pests. However the low mushroom production is caused by a variety of factors, such as a lack of consumer awareness of mushrooms, a lack of strains with high yields that are suitable for the climate in India, traditional compost production methods, and a lack of a diversified mushroom portfolio that is suitable for different agro-climatic conditions. In some location Agricultural residue is burned which is one among the many sources of air pollution. On a local as well as a regional level, burning farm waste seriously pollutes the soil and water. Thus the cultivation of mushrooms using agricultural waste as a substrate can be a promising solution for food security, waste management, and sustainable agriculture. This study highlights the potential of agricultural waste in mushroom cultivation and the challenges associated with this practice in Surguja District of Chhattisgarh, India.

Keywords: Food security, nutrition, medicinal values, substrate, soil pollution.

THE IMPACT OF ACTIVE ENGAGEMENT ON STUDENT ACHIEVEMENT IN A COLLEGE-LEVEL STATISTICS COURSE

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In this two year experiment, two groups of minority students were randomly selected from the overall population of more than 400 students enrolled in a course called “Elementary Statistics.” The selected groups (labeled C for Control, $n = 54$ and E for Experimental, $n = 46$) had the same instructor, lectures, and similar assignments, study sessions, and assessments. The C group was exposed to peer-group problem-solving tasks during class (limited to less than 20 minutes per week) but involvement was not required nor graded. In contrast, the E Group learned via the flipped learning model which required them to be responsible for their own learning in three important ways (all of which counted as a percentage of their grade). These components included: (1) preparing for class by submitting hand-written notes on basic information, (2) taking notes on YouTube videos, and (3) completing weekly in-class group activities lasting 50 minutes.

Analysis of this study remains in progress until the Spring semester is over in May 2023. The final report will contain a full description of the flipped learning model. Evidence-based data and analysis will include:

Descriptive measures (mean, median, mode, interquartile range, standard deviations), and Boxplots of both group’s final grades in the course

p -values using the t -distributions to see if the three components of flipped learning (notes, videos, and class activities) made a significant difference in E group’s final grades in the course

The Pearson coefficient r and correlation coefficient r^2 for the E group final grades, followed by scatter plots with regression models to identify relationships between the three flipped learning components and final grades

E group’s written responses to a survey tool, classified into positive and negative categories

Keywords: Statistics curriculum, flipped learning, minority education

SENTIMENT ANALYSIS USING LONG SHORT-TERM MEMORY USING TENSORFLOW

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In recent years, the use of social media has increased enormously, and hence extracting the semantic expression from social media is the basic essential principle of data mining has grown in popularity in sentiment analysis. It has become an area of research for the stakeholders such as researchers, scientists, etc. Sentiment analysis helps to classify expressions in the form of positive, negative, or neutral and it is used to improve the quality of the product. For sentiment analysis, Long Short Term Memory (LSTM), and type of Recurrent Neural Networks (RNNs) are used. In the review paper, we discuss various classification techniques using TensorFlow, opportunities, and challenges used by researchers in recent years. This review paper will help researchers, research scholars, and scientists to carry out their research work.

Keywords: Sentiment analysis, Long Short Term Memory, RNN, classification algorithms.

A NEW FUZZY SIMILARITY MEASURE AND ITS APPLICATION IN PATTERN RECOGNITION

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Similarity metrics are utilized to match two or more records and are essential to deal with data classification and pattern-matching problems. A fuzzy similarity measure is broadly helpful in expert and knowledge-based systems. Many similarity measures have been introduced in the literature and most of them have produced unreasonable results in the problem related to pattern recognition. In this paper, we propose a new fuzzy similarity measure and utilize it in pattern recognition problems. The comparative analysis of the proposed similarity measure established their validity and suitability over the existing prominent fuzzy comparison measures.

Keywords: Fuzzy sets, Similarity measures, Pattern Recognition

CAMPA AFFORESTATION AND REGENERATION MANAGEMENT IN FOREST

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Compensatory Afforestation Fund Management and Planning Authority (CAMPA) are meant to promote afforestation and regeneration activities as a way of compensating for forest land diverted to non-forest uses. National CAMPA Advisory Council has been established as per orders of The Hon'ble Supreme Court on 10th July 2009 issued orders that there will be a Compensatory Afforestation Fund Management and Planning Authority (CAMPA) as National Advisory Council under the chairmanship of the Union Minister of Environment & Forests for monitoring, technical assistance and evaluation of compensatory afforestation activities.

CAMPA Act or Compensatory Afforestation Fund Act is an Indian legislation that seeks to provide an appropriate institutional mechanism, both at the Centre and in each State and Union Territory, to ensure expeditious utilization in efficient and transparent manner of amounts released in lieu of forest land diverted for non-forest purpose which would mitigate impact of diversion of such forest land. State CAMPA would provide an integrated framework for utilizing multiple sources of funding and activities relating to protection and management of forests and wildlife. Its prime task would be regenerating natural forests and building up the institution engaged in this work in the State Forest Department including training of the forest officials of various levels with an emphasis on training of the staff at cutting edge level (forest range level). In short, the department would be modernized to protect and regenerate the forests and wildlife habitat. The State CAMPA would administer the amount received from the Adhoc CAMPA and utilize the funds collected for undertaking compensatory afforestation, assisted natural regeneration, conservation and protection of forests, infrastructure development, wildlife conservation and protection and other related activities and for matters connected there with or incidental there to. In sum, the prime task of State CAMPA would be regenerating natural forests and building up the institution engaged in this task in the State Forest Department.

Keywords: CAMPA, Forest Management, Afforestation, Regeneration, Forest Department.

CONTRIBUTION OF CHHATTISGARH SAINTS IN THE DEVELOPMENT OF HINDI LANGUAGE

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Hindi is the only language of India which is understood, known and spoken by a large number of people. Hindi is the national language of India. is language. Saints in the development of Hindi language. The contribution of Mahatmas and preachers cannot be measured. Because they are very close to the public. They have a huge and direct impact on the public. Surdas, the chief devotional poet of the Bhakti period of North India. Bhajans of Tulsidas and Meerabai etc. are sung with great devotion by the public. The saints of Chhattisgarh have also given their important contribution in the contribution of Hindi language. In which mainly Saint Dhanidharma Das Ji Saint Maha Prabhu Vallabhacharya. Saint Guru ghasidas and Saint Gahira are Guru ji. Hindi is the only language to establish contact with all over India including Chhattisgarh.

Keywords: Bhakti Period, Bhajans, Devotional

PROGRAM FOR ESTIMATION OF EMISSION FOR DIFFERENT VEHICLE CATEGORY

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Human activities generate three broad sources of air pollution: stationary or point, mobile, and indoor. In developing countries such as India especially in the rural area, indoor air pollution from using open fires for cooking and heating may be a serious problem. Industries, power plants etc. are the cause of stationary air pollution. But in urban areas both developing and developed countries, it is predominantly vehicular pollution that contributes to overall air quality problem.

Keywords: Automobile, pollution, Emission factor, Different source of pollution, Program for estimation of Emission.

A REVIEW ON CELLULAR BIOMOLECULE IDENTIFICATION USING MACHINE LEARNING

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Machine learning (ML) has become a ubiquitous tool in various research fields, including protein science and engineering. In addition to predicting protein structure and mutations, researchers are focusing on bridging knowledge gaps related to the molecular mechanisms underlying protein binding and interactions with other molecules in experimental setups or the human body. To achieve this, scientists are utilizing wet-lab techniques to generate large amounts of data for a better understanding of these concepts and mechanics. However, the information gathered, such as biomolecular structure, binding affinities, and structural fluctuations and movements, is enormous and requires advanced analytical tools like ML. ML is instrumental in assisting research in various fields, such as drug discovery, nanomedicine, nanotoxicity, and material science. Moving forward, the way ahead would be to integrate laboratory work with computational techniques to gain a comprehensive understanding of biomolecular interactions.

Keywords: Biomolecule, Biomolecule interaction, computational tool

CRIME AGAINST WOMEN HARASMENT AT THE WORK PLACE DOMESTIC VIOLENCE

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Violence against women and girls is one of the most oppressive forms of gender inequality and stands as a fundamental barrier to equal participation of women and men in social, economic, and political spheres. such violence impedes gender equality and the achievement of a range of development outcomes. Domestic violence is violence committed by someone in the victims domestic circle. this includes partners and ex – partners. immediate family members. other relatives and family friend. the term domestic violence is used when there is a close relationship between the offender and the victim.

Keywords: Domestic violence, Victim.

REVIEW ON WEBSITE AUTOMATION USING MACHINE LEARNING AND FLASK

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The fashion and entertainment sectors are in high demand in today's society. Users are continually looking for new data and up-to-date trends in these industries. Therefore, it is essential to develop a system that would regularly alert consumers of the same. Today, there are many different recommendation systems that make use of technologies like collaborative filtering, the Bayesian interface, etc. to automatically identify user preferences and create recommendations based on the user's interests. One of the major technologies for delivering personalized services, these recommendation systems should be able to comprehend the context in an environment where IT is omnipresent. In this paper, a machine learning model that combines Random Forest and Gradient Boosting approaches is proposed. A website will be developed that will present the most recent information on the newest trends and upgrades in the fashion and educational sectors, depending on the user's interest.

Keywords: Auto Suggest, Machine Learning, Flask, Front End, Data collection.

CONTRIBUTION OF SAINTS OF CHHATTISGARH IN DEVELOPMENT OF HINDI BHASHA

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Hindi is the only language of India which is understood, known and spoken by a large number of people. Hindi is the national language of India. is language. Saints in the development of Hindi language. The contribution of Mahatmas and reachers cannot be measured. Because they are very close to the public. They have a huge and direct impact on the public. Surdas, the chief devotional poet of the Bhakti period of North India. Bhajans of Tulsidas and Meerabai etc. are sung with great devotion by the public. The saints of Chhattisgarh have also given their important contribution in the contribution of Hindi language. In which mainly Saint Dhanidharma Das Ji Saint Maha Prabhu Vallabhacharya. Saint Guru ghasidas and Saint Gahira are Guru ji. Hindi is the only language to establish contact with all over India including Chhattisgarh.

Keywords: Auto Suggest, Machine Learning, Flask, Front End, Data collection.

ANTIOXIDANT ACTIVITY, TOTAL PHENOLIC AND TOTAL FLAVONOID CONTENTS OF *HEMIDESMUS INDICUS* (L.) W.T. AITON ROOT HYDRO-ALCOHOLIC EXTRACT

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Hemidesmus indicus (Asclepiadaceae), commonly well-known as Indian Sarsaparila. The plant is vernacularly name as Anantmoool and Sweta sariva in Hindi. It is a laticiferous plant found all over the India up to an altitude of 600 m. The plant is commonly used in Indian traditional system of medicines and by Vaidyas, which are used in fever, asthma, diarrhoea, blood purifier etc. Whole root and root-bark are useful in syphilis, rheumatism and in several liver and kidney disorders. It has various pharmacological activities like immunomodulatory, hepatoprotective, anticancer, antiulcer, anti-hyperglycemic activities etc. **Aim and objective:** The aim of present study was to screen hydro-alcoholic extract *Hemidesmus indicus* roots to explore potent antioxidant activity in vitro, total phenolic and flavonoids contents in order to discover feasible sources for novel antioxidants in plants. **Materials and method:** The root part of *hemidesmus indicus* was extracted with hydro-alcohol (70% Ethyl alcohol and 30% of distilled water) by cold maceration. The nature of phyto-components of hydro-alcoholic extract was identified by preliminary phytochemical screening. The total yield, total phenolic and flavonoid content of extract were determined. In vitro antioxidant activity was carried out by radical scavenging activities of DPPH and hydroxyl radical. **Results:** Phytochemical screening of *Hemidesmus indicus* root hydro- alcohol extract showed the presence of carbohydrate, protein, glycosides, flavonoid, and phenolic compounds. The total phenolic contents 2.49 ± 1.32 mg GAE/g extract while total flavonoid contents 1.88 ± 0.23 mg RTE/g extract were found. The plant exhibited significant antioxidant DPPH radical scavenging activity with IC₅₀ value of 1.24 with reference to the standard ascorbic acid IC₅₀ value of 0.98. These antioxidant activities may be due to the presence of antioxidants phytochemicals such as flavonoids, phenols, and terpenoids. **Conclusion:** The present study revealed that *hemidesmus indicus* root extract act against oxidative stress-related disorders for development of a new phytomedicine with antioxidant agent due to its free radical scavenging.

Keywords: *Hemidesmus indicus*, Antioxidant, DPPH assay, Flavonoid and Phenolic compounds

RECESSION PREDICTION USING MACHINE LEARNING ALGORITHMS

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In this study, I tried to find the best way to predict economic recessions by using the supervised machine learning techniques of Logistic regression, Decision tree classifier, k-nearest neighbour classifier, and Support vector Machine classifier, Random Forest, XGB, GLMNET, NNET, PROBIT. For this, I created training and testing sets using the functions train test split and TimeSeriesSplit, as well as walk-forward cross validation sets using the functions TimeSeriesSplit for use when fine-tuning the model's parameters. Nine models of each machine learning technique were created after default parameters and customised parameters were used to train each method on both scaled and unscaled data. The most effective model was found to be a tailored Support Vector Classifier model trained on scaled data with a precision-recall area under the curve (PR AUC) score of 0.87 was the most effective model for forecasting economic recessions.

Keywords: Logistic regression, Decision tree, K-nearest neighbour, Support vector Machine, Random Forest, NNET, GLMNET, XGB, PROBIT

INFERENCEAL STUDY OF ONE-SHOT DEVICE TESTING DATA WITH AN APPLICATION TO A MURINE MODEL

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In the literature, the reliability analysis of one-shot devices is found under accelerated life testing in the presence of various stress factors. The application of one-shot devices can be extended to the bio-medical field, where we often evidence the emergence of certain diseases under different stress factors due to environmental conditions, lifestyle aspects, co-morbidity, etc. This work concerns a one-shot device data analysis and applies it to the Murine model for Melioidosis data. The two-parameter logistic exponential distribution is assumed to be a lifetime distribution. Weighted minimum density power divergence estimators (WMDPDEs) for robust parameter estimation are obtained along with the conventional maximum likelihood estimators (MLEs). The asymptotic behaviour of the WMDPDEs and robust testing of the hypothesis based on it are also studied. The performances of estimators are evaluated through extensive simulation experiments. Later those developments are applied to the Murine model for Melioidosis Data. Citing the importance of knowing when to inspect the one-shot devices put to the test, a search for optimum inspection times is performed. This optimization is designed to minimize a defined cost function which strikes a trade-off between the precision of the estimation and experimental cost. The search is accomplished through the population-based heuristic optimization method Genetic Algorithm.

Keywords: Genetic Algorithm, Logistic Exponential distribution, One-Shot Devices, Weighted Minimum Density Power Divergence Estimator.

A REVIEW ON SOFTWARE PROCESS IMPROVEMENT MODEL (SPIM)

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Software Process Improvement (SPI) is a systematic approach and continuous improvement of software constructing organization's ability to produce and deliver superiority software within time and budget constrictions. A data-driven approach to diminish defects to improve an organization's performance. Lean manufacturing, a systematic process to minimize surplus without sacrificing productivity. In this project, the researcher developed, verified and validated such a model. This paper presents a method to software process improvement model for refining the process overall. Superiority Improvement models express the steps to be taken to achieve goals. These models can be used by any entity like companies, individuals, and even governments. They can be used for big advancements or small impactful changes This paper emphasis on enhancement in process as well as organisation. This model is based on experience on project of software companies, which covered assessment, software process improvement, factor which affects software process improvement. The ultimate intention is to develop a model which would be useful in preparation for small software development companies. In this paper also defines the principle of software process improvement and improvement models.

Keyword: software process, software process improvement model, systematic approach.

SPEECH-RECOGNITION AUDIO BOOK SYSTEM IN LIBRARIES

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Through the creative use of objects, advancements in artificial consciousness are starting to successfully impact human existence. Independent gadgets are getting smarter at communicating in the current day by utilizing new technologies. One of the helpful trends is the development of how people perceive contemporary technologies. This research uses Visual Studio Code to demonstrate a Python that is incredibly on-demand, quick, and user-friendly for speech recognition. This program assists in turning text into speech and vice versa. As an alternative to typing, speech or another sort of voice can be translated into text. This program allows users to speak any message, and the matching text will show on the screen. Text may be produced with ease using modern technologies. With GUI/Voice command, the identified text may be saved in a file. This program is helpful for persons with physical limitations, such as deaf or disabled users, for whom typing is frequently uncomfortable, difficult, or impossible. It is also helpful for those who can hear others talk but cannot read what they are saying.

Keywords: GUI/Voice command, handicapped, Python, Voice Recognition

ASSESSMENT OF VEGETATION DIVERSITY OF KANGER VALLEY NATIONAL PARK, BASTAR, CHHATTISGARH: AN ANALYSIS IN 2023

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The name of Kanger valley National Park is derived from the Kangar River, which flows in its length. Kanger Valley is spread over 200 sq. kilometers. Kanger Valley got the status of a national park in the year 1982. It is a friendly place for high mountains, deep valleys, giant trees and various wildlife species. For the present study, 9 sites representing various categories of the natural forest were selected for vegetation sampling. At each site 15 quadrates (15m x 20m) were laid to quantify various layers. Vegetation Diversity was analyzed for relative frequency, density, and dominance values. These values were added to compute Importance Value Index (IVI).

In our study, we found that the vegetation in the Kanger Valley National Park is characterized by tropical moist deciduous forests, which are dominated by sal (*Shorea robusta*) and teak (*Tectona grandis*) trees. These forests are found in the low-lying areas of the park and are interspersed with bamboo thickets. In the higher elevations, the forests give way to mixed deciduous forests, which are dominated by trees such as *Terminalia arjuna*, *Anogeissus latifolia*, and *Lagerstroemia parviflora*. The park also has several patches of semi-evergreen forests, which are characterized by a mix of deciduous and evergreen trees. These forests are found in the wetter areas of the park and are dominated by trees such as *Schleichera oleosa*, *Dillenia pentagyna*, and *Syzygium cumini*. The park is also home to several species of medicinal plants, including *Emblica officinalis*, *Terminalia chebula*, and *Holarrhena antidysenterica*. These plants are used by local communities for their medicinal properties.

Keywords: Vegetation Diversity, Kanger Valley National Park

A COMPREHENSIVE AND UPDATED REVIEW ON WATER AND WASTEWATER TREATMENT TECHNOLOGIES

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Global water crisis is a burning and rapidly emerging environmental issues of current times. The only option for obtaining fresh drinking water in the coming decades will be through water treatment and recycling techniques due to acute shortage of freshwater resources across the world. The collective concern over the growing demand for drinking water and awareness of the need for systems to improve water quality for drinking water has encouraged technological development and scientific acumen. Industrial wastewater as well as effluent treatment facilities have further provided incentives to create new technologies and enhance the functionality of existing ones. The protection of human health and the environment is the ultimate purpose of water and wastewater treatment. The removal of pollutants from wastewater using water and waste water treatment methods is reviewed in this work. The principal pollutants in wastewater include halogenated hydrocarbon compounds, heavy metals, dyes, organic compounds, fertilizers, pesticides, and herbicides. This paper further discusses the use and importance of wastewater treatment methods such as biofilm technology, aerobic granulation and microbial fuel cells.

Keyword:- Industrial Wastewater, Effluent treatment, Pollutants, biofilms, microbial fuel cells.

STUDIES ON WEED DIVERSITY OF DEFFERENT LAND USES OF UDAIPUR AREA, SURGUJA, CHHATTISHGARH, INDIA

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Weeds are unwanted plants that grows in natural habitat . They have shown significant promise in terms of providing some ecological services in terms pest control, nutrients recycling, crop pollination, and improve soil physical quality. Weed biodiversity also has a number of biological functions in and around fields. The present investigation was carried out to evaluate the weed diversity and phytosociological attributes of observed weed species under different land uses of Udaipur area , Surguja district, Chhattisgarh. Quadrate study was done by laying 24 quadrats of 1m x 1m size in different land uses. Weed species were studied in different 4 landuses such as - hilly area, agriculture land, forest land and grass land of the concerned study sites. Results reveal total 9 weed species were found in the rainy season, 7 weed species in the winter season and 4 weed species was found in summer season. This study helps in finding indegenous and beneficial weed species in the concerned area. This research will help in documentation of these species, their utilization and for better managemnt of weed in natural habitat.

Keywords: Weed, Udaipur, Phytosociology, diversity

SOIL PHYSICO-CHEMICAL CHARACTERISTICS UNDER DIFFERENT LAND USE TYPE OF KAPSARA AREA, SURAJPUR DISTRICT OF CHHATTISGARH, INDIA

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The most essential natural resources for maintaining fauna or flora on planet is soil. The main objective of this research was to evaluate the physio-chemical qualities of the soil in the Surajpur region of CG, India. In three (regeneration site, mining site and natural forest site) distinct types of land use, 30 soil samples was collected from 0-30 cm depth. Soil pH, conductivity, Total nitrogen, potassium and organic carbon were determined following standard methods. Results reveal that soil ph is acidic in nature and ranged between 6.26 to 6.91. Soil conductivity ranged from 15.8 to 268, total nitrogen ranged from 25.088kg/ha to 288.512kg/ha, soil available potassium ranged from 5.4 ppm to 17.76 ppm and Organic carbon ranged between 0.21% to 0.83%.Results reveal higher NPK and Organic carbon value I regeneration site in comparison to other land uses. This therefore, suggests that restoration approaches tend to improve soil quality on sustainable basis.

Keywords: soil, Coal mining, Land use, soil quality

FAKE NEWS DETECTION USING MACHINE LEARNING CLASSIFIER- A BIG CHALLENGE FOR CYBERSECURITY: A CASE STUDY OF THE REAL-TIME DATA SET

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Misinformation and Disinformation are emerging as the biggest challenge in cyber risk after COVID-19 rapidly. There is much discussion among researchers on the effect of Fake News, Misinformation, and Disinformation that badly effects political processes and business processes. Therefore, Fake News emerged as a challenging concern for cyber security. In this paper, we provide an extensive survey on Fake News detection and Fake News detection with Support Vector Machine (SVM), Logistic Regression, and Random Forest Classifier using a real-time dataset as a case study. This paper helps researchers for overcoming the effect of Fake News in the field of cybersecurity and cybercrime.

Keywords: Fake News detection, Cybersecurity, Support Vector Machine (SVM), Logistic Regression, Random Forest Classifier, Machine Learning

STUDIES ON CARBON STOCK OF TREE SPECIES SURROUNDING BAUXITE MINE AREA OF MAINPAT, SURGUJA, CHHATTISGARH, INDIA

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Bauxite mining has severe negative consequences over the ecosystem. A field study was conducted in Mainpat area adjacent to bauxite mining to evaluate the carbon stock of observed tree species. Standard methods were followed under field conditions to determine the value of girth, diameter, total biovalue, above ground biomass, below ground biomass, total biomass, carbon stock. Results reveal that the girth value of 15 species ranged between 12 cm to 119 cm, diameter 0.038192 cm to 0.37874 cm, tree height 316.67 cm to 2480 cm, total biovolume 0.011749 m³ to 7.05 m³, above ground biomass 0.032307 kg to 6.46 kg, below ground biomass 0.010036 kg to 8.72 kg, total biomass 0.040707 kg to 8.14 kg, carbon storage 0.75401gm to 1464.5 gm. From the result it was observed that *Shorea robusta* reported maximum AGB, BGB, TB, carbon stock value during the present investigation. Hence plantation of *Shorea robusta* were recommended for sustainable management of soil of bauxite mined area.

Keywords: Mainpat, carbon stock, tree species.

DOMESTIC VIOLENCE AND WOMEN

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Domestic violence is present in almost every society of the world. It is a universal phenomenon. This term can be classified on various grounds. Whatever the time, place and circumstances, the status of women has always been considered low and this belief has been expressed. that she should be subject to the male If the status of women is reviewed in the context of the Indian social system, then at one time it was considered to be very superior, respectable and proud, but behind this history of pride, the autobiography of women exploitation, humiliation and oppression is hidden.

In the constitution, women have been given equal rights as men, despite dowry practice, kidnapping, rape, obscene acts and Unconscious in the vicious cycle of domestic violence, women are not getting rights from their situation, the era has changed, the country is independent, even after long years of independence, women are becoming victims of domestic violence, it is understandable.

Keywords: Domestic, Prevention, awareness, psychological

WE BECOME FREE FROM CYBER CRIMES

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Cybercrime primarily consists of actions that use the internet and computers as a tactic to obtain private information about a person, either directly or indirectly, and to illegally or without the person's knowledge disclose it on online platforms with the intention of damaging the person's reputation or causing them mental or physical harm. With the advancement of technology, there come some ill effects too which have increased cyber crimes manifold. The question is can India or may it be any nation will ever be able to set themselves free from cyber crimes? In order to safeguard men, women, and children who are harassed and exploited for voyeuristic purposes, cybercrime has emerged as a serious challenge for law enforcement authorities around the world. Women are also frequently the targets of online stalking, cyber pornography, impersonation, and other crimes. In order to prevent the public from being used by cruel predators, India is one of the few nations to have passed the IT Act 2000. Yet, this act doesn't address some of the most serious threats to women's security, and concerns regarding women are still rising rapidly. Here we will look at the present laws in this context and also try to give some suggestions for further improvement.

Keywords: Cyber Crime, Pornography, Security.

STUDIES ON IMPACTS OF VEGETABLE WASHING ON SEED GERMINATION OF SELECTED CROP SPECIES UNDER LABORATORY CONDITIONS

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Present investigation was carried out to study the impact of vegetable washing on germination and growth attributes of pea and maize (zea mays) seed. Six different treatment of vegetable washing was prepared during the present investigation. Each dilution of vegetable washing was replicated thrice. Result reveal that 10%-20% dilution of vegetable washing was stimulatory for germination and growth attributes of maize and pea seedling. Therefore 10%-20% dilution of vegetable washing can be used for irrigation purpose to boost up the agriculture productivity.

Keywords: Germination, Vegetable washing, Crop Productivity.

STATUS SURVEY OF MEDICINAL PLANTS ALONG WITH THEIR MEDICINAL IMPORTANCE IN SELECTED VILLAGE OF SURAJPUR DISTRICT IN CHHATTISGARH. INDIA

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A medicinal plant is any plant which, in one or more of its organs, contains substances that can be used for therapeutic purposes or which are precursors for the synthesis of useful drugs. Medicinal plants have got various important medicinal properties help in human well being. The present investigation was carried out in Ganespur village of Silphili area of Surajpur District in Chhattisgarh, India. Field based survey method was used for documentation of medicinal plant resources of the concerned area. The objective of the present investigation was to evaluate the medicinal plant diversity of the concurred study site along with their use and medicinal importance. During the investigation 27 medicinal plant species representing 25 family was recorded during the study. Among the observed species of medicinal plant, 14 were trees, 8 shrubs and 4 herbs along with 1 vine. Among the 25 medicinal plant species, 2 representatives were observed for *Malvaceae* and *Zingiberaceae* family. Among the medicinal plant species, 7 plant species were used in the treatment of fever and pain. Whole plant body of 10 different species were used for medicinal purpose. Considering the diversity of medicinal plant species sustainable harvesting and management is required to promote conservation of medicinal plant resources.

Keywords: Medicinal plants, medicinal use plant diversity.

THE PRINCIPAL'S OF FAIR TRIAL

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Let hundred guilty be acquitted but one innocent should not be convicted. Until guilty is proved, one has right to prove oneself innocent. Procedure under which one's trial has to be done, must be just, reasonable and free from every kind of partiality. It must follow the procedure established by law and basic principle of natural law. United nation declaration on human right art 10, 11, 14 also established the same view, Reason behind that is mere allegation can't be held guilty to anyone because justice should not be done but it should be appear to have been done. Human, legal, constitutional right of a person to defend oneself for that for this following principle play vital role in providing justice- Presumption of innocence of accused, Right of accused to have a proper defense, Right to legal aid, Impartial judiciary, Benefit of doubt, Right against self-incrimination, Right to speedy trial, Right against double jeopardy.

Keywords: Speedy Trial, Legal aid, Benefit of Doubt.

OPTIMAL STRATEGY FOR ELEVATED ESTIMATION OF POPULATION MEAN FOR STRATIFIED RANDOM SAMPLING UNDER LINEAR COST FUNCTION

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In this paper, we propose the exponential ratio type estimator for the estimation of population mean in the stratified random sampling by using the traditional ratio estimator and Bahl and Tuteja (1991). The bias and the mean squared error of the proposed estimator are derived up to first order approximation and compare with existing estimators and also obtained the mean square error of the proposed estimator with the linear cost function, we find theoretical conditions that the proposed estimator is more efficient than other estimators. The numerical illustration is also included to verify theoretical findings for their practical utility.

Keywords: Stratified random sampling, Percentage Relative Efficiency and Linear cost function.

REASONS AND REMEDIES: ABNORMALITY IN BREAST LEADING TO BREAST CANCER

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Getting breast cancer is a challenging task that can be dangerous to health if not detected early. There are many tools and technological advances in diagnosing breast cancer. Mammography has become a popular testing method. However, mammography exposes the patient to radiation and causes discomfort to the patient. Thermographic tests do not require mechanical contact and are less expensive than mammography, which allows patients to receive more frequent tests. Advances in artificial intelligence technology have allowed a comprehensive neurological network approach to assist physicians in rapid diagnosis [7, 8]. It compares the effect of combining the medical information collected by each patient with the sample.

Although these efforts in the past were aimed at developing a hot model for breast cancer, the majority were academic exercise by imitation. These modeling efforts combined have the following limitations:

1. Lack of clinical data to be measured by model (here, thermography of breast cancer).
2. Lack of actual breast shape (i.e., extra geometry), is unique and varies from person to person.
3. Lack of true definition of the tumor (i.e., size and (x, y, z) and the inner surface of the breast).
4. The use of Pennes' bioheat equation as the dominant, naturally limited and simplified equation.
5. Absence of true internal vasculature and blood vessels (i.e., hemodynamic) information in the breast.

Therefore, the aim of the current study was to determine the hot features of breast cancer by creating a computer- assisted hot (or bioheat) model based on actual clinical data.

Keywords: Thermography, breast cancer, mammography

PATCH WISE ASYMMETRY ANALYSIS OF THERMOGRAMS FOR PREDICTING BREAST ABNORMALITY LEADING TO BREAST CANCER DETECTION

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One morning breast health is considered a life-saving procedure. Thermography shows promise of diagnosing breast cancer especially in dense breasts where mammography is not working properly. It is a non-invasive and cheapest method based on the principle that harmful plants have a high rate of digestion and therefore emit more heat. The new classification algorithm is designed for the latest website of hot images obtained from patients lying in a reclining position. The algorithm has been successful in dividing the breast throughout the body and back. The resulting segment was then analyzed using temperature profiles, where significant peaks in the profile indicated a region of interest. Finally, almost tropical areas were discovered that indicated the location of a potential plant.

Keywords: Thermography, breast cancer, mammography

MEASUREMENT OF COMPLEX DIELECTRIC CONSTANT OF SOILS OF BILASPUR REGION OF CHHATTISGARH AT X- AND C-BAND MICROWAVE FREQUENCIES

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Soils of Bilaspur region collected for study of dielectric Loss and dielectric constant at X- and C-band microwave frequencies. The dielectric constant depends on the moisture content in the soil and frequency of measurement. Dielectric constant increases slowly up to some extent with moisture content in the soil after that it increases rapidly. It is found that comparing with the empirical models measured values of dielectric constant of dry and wet soils to be in agreement. For calculation of emissivity of soil for various moisture content observed value of dielectric constant is used.

Keywords: Dielectric constant, Microwave frequency, Soil moisture content, Emissivity

A FACTOR ANALYTIC APPROACH TO CUSTOMER SATISFACTION TOWARDS MOBILE NETWORK PROVIDERS

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Mobile network providers are experiencing rapid growth in the Indian market. There is fierce competition among the current companies in India, which is the second-largest market for mobile network providers worldwide with a subscriber base of 1.16 billion and has registered strong growth in the last decade. Customer happiness becomes a critical concern in such a cutthroat economy. The objective of this paper is to identify the variables that affect the customer satisfaction in the telecommunication industry and measure customer's perception about telecommunication services. The study extracted the factors that influence overall customer satisfaction towards mobile service provider with the help of Factor Analysis. Concentrating on these factors can boost customer benefit and decrease expense to the client. This study offers insights for mobile network providers to understand the determinants of customer satisfaction.

Keywords: Customer Satisfaction, Mobile Service Provider, Factor Analysis

ENHANCEMENT OF CLASS OF ESTIMATORS FOR ESTIMATING POPULATION MEAN USING KNOWN AUXILIARY PARAMETERS

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In this article, a family of estimators that use the existing auxiliary variable to estimate the mean are suggested. Mean is usually considered the best and the most frequently used measure of central tendency. Estimators are improved by adding auxiliary information and can be used for estimation of mean. Some improved class of estimators are suggested in this paper. The bias and mean squared error (MSE) of the recommended estimator are determined up to first order approximation. The suggested estimator is theoretically contrasted with the existing estimators. The mathematical efficiency of the proposed estimator is demonstrated by the obtained MSE using actual data set.

Keywords: Estimator, mean, mean squared error, study variable, auxiliary variable

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING IN AUTOMOTIVE: OVERVIEW OF CURRENT AND FUTURE APPLICATIONS

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Artificial intelligence (AI) and machine learning (ML) have revolutionized many industries, and the automotive industry does not exception. AI and ML technologies are making cars smarter, safer and more efficient. In this article, we review current and future applications of AI and machine learning in the automotive industry, including autonomous driving, predictive maintenance, and intelligent traffic management. We also discuss the challenges and opportunities associated with these technologies.

Keywords: Automobile, AI, ML, Automotive Industry

INCREASE THE QUALITY OF REMOTE SENSING IMAGES USING DWT FUZZY & HIGH-PASS FILTERING TECHNIQUE MODEL

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High resolution satellite images are of a vast significance in lots of fields of studies. For the previous couple of decades Wavelets are playing a key function in photo decision enhancement method. Excessive-pass filtering aspect densities in place of weighted sum of community pixels which include bicubic or bilinear interpolations. There are numerous ripple domain based totally strategies like AHE, separate ripple remodel, CLAHE, difference and stationary ripple transform. On this paper we use DWT transforms, those transforms decompose the given photograph into 4 sub- bands, out of that one is of low frequency and consequently the relaxation are of high frequency. It's far proved with the quantitative (peak signal-to-noise ratio and nice index) and visual results over the traditional and state-of- art photograph resolution enhancement strategies. The HF elements are interpolated the usage of traditional interpolation techniques. Then we use IDWT to combine the interpolated excessive frequency and low frequency parts.

Keywords: DWT, CLACH, Edge Enhancement, Fuzzy Contrast Enhancement, Remote Sensing Images, High-Pass Filtering

ANALYSIS OF DIFFERENT MACHINE LEARNING ALGORITHMS FOR HAND GESTURE RECOGNITION

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An expanding field of recent study on the machine learning paradigm is gesture recognition systems. So, it is essential for effective communication to grasp the real meaning behind every hand gesture so that the recipient can respond with the suitable response. The interaction between humans and computers is improved by the accurate hand gesture prediction. Data preparation and classification are the two separate components of the proposed study. In order to accomplish the gesture detection and classification procedure, a variety of classifier techniques are available. In this study, analysis was carried out using a number of the most widely used machine learning classifiers, including Stochastic Gradient Descent (SGD), Decision Tree (DT), Random Forest (RF), Gaussian Nave Bayes (NB), Logistic Regression (LR) and K Nearest Neighbors (KNN). The experiments were performed using a standard KAGGLE dataset containing total 20,000 hand gesture images of 10 different gesture positions. On the basis of experimental analysis of each and every technique, Random Forest and KNN predicting accurate results than the other algorithms like Stochastic Gradient Descent (SGD), Decision Tree (DT), Gaussian Nave Bayes (NB) and Logistic Regression (LR).

Keywords: Machine Learning, Gesture Detection, Stochastic Gradient Descent (SGD), Decision Tree, Random Forest, Gaussian Nave Bayes, Logistic Regression (LR) and K-Nearest Neighbors (KNN).

PHARMACEUTICAL APPLICATIONS OF INFRARED SPECTROSCOPY: A COMPREHENSIVE REVIEW

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Infrared spectroscopy (IR) is an absorption method widely used in both qualitative and quantitative analysis. The infrared region of the spectrum includes electromagnetic radiation that can alter the vibrational and rotational states of covalent bonds in organic molecules. The IR spectrum of an organic compound is a unique physical property and can be used to identify unknowns by interpretation of characteristic absorbances and comparison with spectral libraries. IR spectroscopy is also used in quantitative techniques because of its sensitivity and selectivity. It can be used to quantitate analytes in complex mixtures and is used extensively in detection of industrial pollutants in the environment. The IR technique is discussed here primarily for application in identification of organic compounds and will focus on the mid- infrared region. Infrared spectroscopy measures the concentration changes of oxygenated and deoxygenated hemoglobin, associated local brain activity. It is a relatively new and increasingly widespread brain imaging technique. The basic physical, physiological, and neural principles underlying the use of IR and some of the existing developmental studies are reviewed. Instrumental operating procedures are not given because they will vary depending on instrument design. A brief discussion of the theory will be followed by a discussion of instrumentation, sample handling techniques, and qualitative analysis. In the following review various aspects of IR its principle, introduction, instrumentation, and its application in pharmaceuticals have been executed.

Keywords: Infrared Spectroscopy, Pharmaceutical Application

MAHUA (*MADHUCA LONGIFOLIA*) AS A POTENTIAL LIVELIHOOD OPTION FOR TRIBALS OF BALRAMPUR AREA OF CHHATTISGARH

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Mahua holds a unique position among NTFPs due to its connection to tribal livelihood and significance as a source of seasonal income. The tree is widespread throughout the Indian subcontinent and is known by a number of different local names. It is primarily been used up until now to make flower-based alcohol. Yet, different portions of the tree have been given various therapeutic and practical virtues. The present study attempts to document different food items and culinary uses of the flower, fruit, and seed of the mahua tree with the goal of supplying the industry with important raw resources. Mahua flowers can be used in the formulation of a variety of functional foods as sugar substitutes. The study was done in the three blocks of the Balrampur district viz. Balrampur, Kusmi, and Shankargarh with an objective to record the traditional method mahua flower collection, post harvest storage methods, use of mahua flowers and it's preparation methodology and the marketing. The results envisage that the Mahua flowers were traditional technique i.e. picking up the flowers from the ground under, and around the trees. Typically, it takes about 5 to 6 hours, to pick a basketful of flowers and the collection continues up to 15-20 days. Mahua flowers sold for between Rs. 35.00 and Rs. 40.00 per kg. The price of oil fluctuated between Rs. 90.00 and 100.00 per lit, the market price of seeds ranged from Rs. 25.00 to 35.00 per kg. Different value added mahua flower food products are being made like dried flower, ready to serve (RTS) beverage, squash, jam, bar, candied flower, glazed flower etc. In about 10 kg of mahua flower yields 9 kg of pulp for product preparation after removal of stamen, sand and dust. To prepare 200 lit of RTS, 15 lit of squash, 17.5 kg of jam, 13.5 kg of bar, 11.5 kg of candied flower, and 13.5 kg of glazed flower, 10 kg of dried mahua flower is required. Although consumers enjoy the prepared value-added items made from Mahua flowers, they are not widely used or well known locally.

Keywords: Value addition, Branding, Sugar Replacer, ready to serve

CURRENT STATUS AND FUTURE PROSPECTIVE OF NOVEL DRUG DELIVERY SYSTEM FOR LUNG CANCER TREATMENT: A COMPREHENSIVE REVIEW

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Cancer is abnormal cells divide without control monitoring and are able to attack other tissues, cancer cell spread through the blood and lymph systems, cancer is the critical diseases that cause several deaths around the world. Lung cancer is the second most common cancer worldwide Lung cancer is a common fatal tumor that poses a severe threat to human life due to its high diffusion and mortality. Patients with lung cancer are often diagnosed in the middle and advanced stages of the disease that show unfavorable clinical results. Novel drug delivery systems (NDDS) have many benefits which involve improved therapy by increasing the impact and time of drug activity, decrease patients' compliance through decreased dosing repetition and suitable route of administration and improved targeting for a specific site to reduce undesirable side effects. Chemotherapy, surgical treatment and radiation therapy are commonly used to prevent lung cancer. Anti-cancer therapy, systematic chemotherapy and has serious toxic side effects. Nanotechnology has recently emerged as a potential approach to lung cancer management and treatment. The nano-carrier-loaded anticancer drug delivery system have shown promising potential to treat lung cancer and its target is to control the growth of tumor cells. The present review highlights the current status of the development of novel formulations which focuses on increasing the bioavailability and decreasing toxicity of anti-cancer treatment. The present review highlights the current treatment use of nano drug delivery systems in lung cancer cure. This review aims to propose new ideas for developing and improving nanocarriers for lung cancer drug delivery.

Keywords: Novel Drug Delivery System, Lung Cancer, Cancer, Target drug delivery, Nano Drug Delivery

DETECTION OF PLANT'S DISEASE USING DETECTRON2 LIBRARY WITH MASK R-CNN

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One of the major problems and challenges in agriculture is the prevention and early identification of plant diseases. Farmers devote a lot of time in inspecting and spotting unhealthy plants, by examining plant leaves. Poor plant disease management, such as late detection or the use of the inappropriate pesticides, frequently results in crop damage, which lowers the quality of food. Artificial intelligence and machine learning could be used to solve this issue by analysing digital images of leaves to find plant illnesses. The leaf is the best sign of a plant's health, thus by using machine learning, we can develop prediction models to identify the status of the leaf more quickly, perhaps preventing or reducing losses. In the existing literature, it has been found that deep neural networks and its variations are widely used to address these problems which consumes too much time for training large dataset. On the other hand, Detectron2 software library and the Mask R-CNN neural network are used in this paper to detect the condition of the leaf which shows significant improvement in training time. Facebook's latest vision library, Detectron2, makes it simple to use and develop models for object identification, instance segmentation, key point detection, and panoptic segmentation. Detectron2 helps in faster training. The pre-processing of dataset is done using RoboFlow tool. The model was trained using the PlantDoc dataset with 2569 images provided by Indian Institute Technology, Bombay.

Keywords: Artificial Intelligence, Image Processing, Leaf Disease Detection, Machine Learning, Plant Disease Detection, Detectron2.

PROMISING ANALGESIC & ANTI-INFLAMMATORY RESPONSE OF CYNODON DACTYLON (L.) PERS.

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Animal models were used to evaluate the hydro-alcoholic extract of *C. dactylon* for its potential anti-inflammatory and analgesic effects. After being air-dried, the powdered substance was then extracted utilising a hydro-alcoholic (60:40) solvent. Analgesic and anti-inflammatory experiments were carried out on the crude dried extract (64 g) at doses of 100, 200, and 400 mg/kg respectively. The tests were conducted using carrageenan to elicit paw edoema. According to the results of Dunnett's t-test, the extract exhibited substantial ($p < 0.05$) anti-inflammatory action, the magnitude of which was shown to be dose-dependent. When the extract was at its maximum concentration, both its analgesic and anti-inflammatory properties were at their peak. These findings, along with those from other studies, indicate that the hydro-alcoholic extract of *C. dactylon* may have pharmacological activities that are worth investigating further. Additionally, these findings lend credence to the traditional use of the plant for the treatment of pain and inflammation.

Keywords: *Cynodon dactylon*, hydro-alcoholic extract, analgesic, anti-inflammatory activity.

CRYPTOCURRENCY MAY KILL INDIAN ECONOMY IN FUTURE

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From the ancient time people are using so many technology for exchanging thought, information and product but in this information age peoples are moving from local market to global market and traditional currency is converting into digital cash. Here traditional banks are playing main role for circulating money either conventional currency like Rupee, dollar etc. or online digital currency. In this system government eyeing over on local and global investors and marketers and control all activities under protocol, for that government take tax for executing country's economic system. Today's technology rapidly changed and peoples are using crypto currency for saving tax because. Crypto currency is not controlled by Government or any kind of controlling authority and it is also Tax less and it cannot be hacked by hacker or intruder. It is totally secure or managed and generate by any person although government need to use private block-chain technology for controlling. It does not require to deposit in traditional bank instead of that Person can hold crypto currency into digital wallet or crypto wallet. Crypto currency wallets store secret keys used to digitally sign transactions for block chain distributed ledgers, but their future goes far beyond being just a keeper of crypto currencies. On the contrary crypto currencies are increasing criminal activities too because there not any controlling authority. Some intruder or hackers may misused crypto currency for selling or purchasing data in global market and also used ransom ware for hacking this type of digital money or currency and may destroy the country economy with in second and government may not detect source easily. With its nature of decentralized system and peer to peer technology, crypto currency has the power to dismantle a traditional banking system in which an authority is responsible for decisions that affect the economic system of entire country. But the crypto currency has its own drawbacks that make it difficult to make a case for a decentralized system consisting of the crypto currency. For that crypto currency is not still legitimate or precise and herewith government of many countries Ban this currency and also criminals using this currency for conducting criminal offense like account hacking, block traditional banking activities and unauthorized transactions. India is the developing country and populations are too much high. So government is not getting to make proper policy for controlling this activity and it may dangerous for economic system in future.

Keywords: Block chain, Crypto currencies, Data Science.

ASSESSING THE EFFECTIVENESS OF HELPER SKIN TAP TECHNIQUE ON PAIN REDUCTION AMONG CHILDREN UNDERGOING INTRAMUSCULAR VACCINATION IN FLACC NUMERICAL PAIN SCALE

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INTRODUCTION: Intra muscular vaccination is complex technique used to deliver vaccines among childrens deep into the large muscles of the body. Pain at injection site is one of the most commonly-reported local reactions associated with administration of a vaccine. It is more painful when combination of more than two vaccines injected at a time among childrens. Pain management in invasive procedure is a challenge to the nurse. Hence, complementary therapy like Helper skin tap technique has its own significance and provides a mechanical stimulation and distraction during intramuscular vaccination and thus helps to decrease pain as described by gate control theory which keeps the muscles relaxed while administering IM injection. **OBJECTIVE:** A study to assess the effectiveness of Helper skin taps technique on pain reduction among children undergoing intramuscular vaccination at district hospital Waidhan, Singrauli. **METHOD:** The study involved quasi experimental post test only design with non-probability purposive sampling method. The data was collected from 60 Childrens undergoing intramuscular vaccination. **Intervention:** In Helper skin tap technique Intramuscular vaccination is done by tapping to the injection site by using palmer aspect of the hand about three times and inserting the needle without the feeling of pain and removing the needle by tapping the area again three times. **Tools:** Standardized FLACC 0-10 numerical pain scale used to assess the pain reduction among children undergoing intramuscular vaccination. **RESULTS:** The data collected was analyzed using descriptive and inferential statistics. The study shows using standard technique in control group 27 childrens had moderate pain (90%), 3 childrens had severe pain (10%) while in experimental group 17 had moderate pain (57%), 8 had severe pain (26%) and 5 had mild pain (17%). Analysis among experimental group by using paired 't' test found significant value 5.94 at $p < 0.05$ level. The study shows that after the procedure observation intramuscular vaccination is less painful in experimental group as compare to control group among children. **INTERPRETATION & CONCLUSION:** The study shows that Helper skin tap technique was more effective on pain reduction undergoing intramuscular vaccination than the usual standard technique used among children.

KEYWORDS: Helper skin tap technique, Intramuscular, Vaccination, Children

PLANT BIOSENSORS AND ITS ROLE IN AGRICULTURE

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Plant biosensors are the devices which have the capacity in detecting pathogenic microorganisms in fast and reliable manner. This is mainly done by using enzymes and aptmers and nanomaterials. Nanomaterial based biosensors can be used for early detections of plant disease caused by biotic and abiotic agents. genome editing technology more specifically CRISPR-Cas can be used in development of DNA based biosensors. Portable biosensors have certain challenges in sample preparations, energy needs etc. This article mainly discusses the potential application of biosensors and its role in reducing loss in agriculture

Keywords: nanomaterials, Agriculture, Plant biosensors, Aptmers

A COMPREHENSIVE REVIEW REGARDING "ARTIFICIAL INTELLIGENCE " IN MEDICAL FIELD

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Artificial Intelligence (AI) is a collection of numerous technologies that work together to give robots the ability to see, understand, act and learn at levels of intellect comparable to that of humans. It has become more prevalent in many spheres of life most notably in medical field. Nearly every area of medicine has investigated the effectiveness of AI tools. The goal of AI is to imitate cognitive process in humans. Moreover, it holds numerous of applications in medical area such as Clinical Trial Participation, Healthcare System Analysis, Targeted treatment in disease diagnosis. Its current applications focuses on Nephrology, Cardiology, Computational diagnosis of cancer in Histopathology, Neurology etc. without a question AI is developing quickly and becoming pragmatic everyday and has given us a rapid increase of its capabilities. In near future Healthcare applications of AI will advance, as there is also a possibility of deriving prime details from a patient's electronic footprint. Overall, a short review on AI has been done accompanied by a discussion of AI, its applications future use etc. has been highlighted.

Keywords: Artificial Intelligence, Robots, AI Tools, Disease Diagnosis, Computational Diagnosis Medical Field, Current Applications.

BIG DATA AS AN AGRICULTURAL TOOL AS “INDUSTRY 4.0”

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Big data is divided into five dimensions known as the 5Vs volume, velocity, variety, veracity, and value. Big data expansion is a contemporary phenomena that affects not just information technology but also other industries. The agricultural sector is also seeing the advent of Big Data, which is fueling the creation of numerous low-cost and portable sensors. Soil moisture, temperature, and humidity sensors, RGB cameras, and hyperspectral cameras are among the sensors available. Data acquisition is crucial, but so is data analysis. It has been demonstrated in remote sensing, smart farming, Internet- of-Things (IoT), supply chain automation, and farm decision making. This paper reviews, discusses, and lists the challenges and limitations of big data in agriculture as an emerging instrument for transforming agriculture as Industry 4.0.

Keywords: Big data, Agriculture, Industry, Smart Agriculture, Decision support system.

AN ANALYSIS OF BLUETOOTH VULNERABILITIES AND ADVANTAGES OF AURA CAST OVER EXISTING VERSIONS

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Who knows how prevalent Bluetooth could be in the future? Today, 7 billion devices use Bluetooth, which makes it the most preferred wireless technology. It even beats Wi-Fi! Still, every year new features are added on. Bluetooth has evolved over a span of 23 years since the inception of version 1.0 in 1999. This study is completely focused on the versions of Bluetooth and the future evolution “Aura Cast”. So the analysis has been made on the distinguish version of Bluetooth. Version 5.2 of the Bluetooth technology has been the most recent and updated version, leading 21st century. It is found that Bluetooth version 5.2 is the most upgraded version till date as it focuses on providing a better operation framework for IOT devices. Addition of the Slot Availability Mask (SAM), which further lessens interference with LTE. Aura Cast will be the new evolution over existing Bluetooth versions. This survey includes the detailed descriptions of versions in terms of speed, range, compatibility and focuses on version’s vulnerability and defining Aura Cast with their advantages. The findings will help the research community to have a clear vision over all the versions of Bluetooth technology with the future scope with the upcoming milestone that is Aura Cast.

Keywords: Bluetooth; FHSS; Related Work; Existing Versions; Aura Cast; Working of Aura Cast ; Features of Aura Cast; Weakness of Existing Version; Strength of Aura Cast, Comparison.

FOREST FIRES: CAUSES, EFFECT AND PREVENTION

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Forest fires have been on the rise in some of the world's coldest places in 2021. This is a result of climate change and global warming. According to forest officials, many fires are intentionally started. Forest fires are uncontrollable flames that consume trees, animals, meadows, and brushlands in their path. The wind spreads the fire quickly, generating substantial air pollution. Climate change is generally responsible for longer-lasting or extremely flammable flames. There have also been reports of human-caused forest fires, lightning strikes, and significant drought. Forest fires have become a global problem, affecting many countries. Significant loss of lives and property is expected. Moreover, the carbon dioxide released into the air as a result of forest fires causes lung and skin illnesses in humans. Forest fires in India are most common in March and April, when the ground is covered with dried logs, hay, weeds, trees, and leaves. When the temperature is high or exceptionally dry, friction from rubbing branches can cause forest fires in some cases. Forest fire causes include the burning of woods for a living or excessive irrigation. Reckless behaviour such as a carelessly dropped cigarette butt or matchstick, can lead to serious mishaps. The Simlipal forest fire was triggered by locals burning dry leaves to harvest mahua flowers, according to the Indian Express. Forest fires may have an economic impact since many households and towns rely on the forest for food, fodder, and fuel. It destroys tiny shrubs and grasses, causing landslides and soil erosion. Forest fires produce smoke and harmful gas emissions, which pose serious health risks to humans. The loss of trees can change climatic conditions and affect the carbon cycle. Wildfires destroy animal habitats, prompting them to stray into cities. Several people perish in the fires because they are unable to flee. These wildfires wreak havoc on the vegetation, soil quality, and general flora and fauna.

Keywords: Forest Fires, Climate Change, Global Warming,

EVALUATION OF ANTI-ALLERGIC AND ANTI-HYPERSENSITIVITY ACTIVITIES OF ETHANOLIC EXTRACT OF ELAEOCARPUS GANITRUS FRUITS IN DIFFERENT EXPERIMENTAL MODELS

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The present study reports the anti-allergic activity of ethanolic extract of *E. ganitrus*, and its possible mode of action. The effect of extract of *E. ganitrus* at different doses (250, and 500 mg/kg, orally) was simulated on studied animal models of asthma and allergy: a) milk induced eosinophilia and leukocytosis; b) compound 48/80 induced mast cell degranulation; and, c) active and passive cutaneous anaphylaxis. In addition, extract of *E. ganitrus* effect on sensitized guinea pig ileum (ex vivo) and tracheal chain preparations (in-vitro) were investigated. Treatment with extract of *Z. jujuba* at all doses significantly: prevented the milk-induced eosinophilia and compound 48/80 induced degranulation of mesenteric mast cells; decreased passive cutaneous and active anaphylactic reactions. In addition, extract of *E. ganitrus* inhibited acetylcholine as well as histamine induced tracheal chain contraction, and also antigen induced contraction of sensitized guinea pig ileum (Shultz-Dale inhibition test). Furthermore, it exhibited also free radicals scavenging activity (in vitro). The observed anti-allergic and anti-anaphylactic activity of extract of *E. ganitrus* may be largely through the stabilization of mast cells by the membrane presence of phytoconstituents (steroidal saponins and flavonoids).

Keywords: Histamine, allergy, anaphylaxis, rudraksha, immunity

TO ASSESS THE LAND MANAGEMENT AND REHABILITATION TECHNIQUES OF COLLIERIES IN SURAJPUR DISTRICT OF CHHATTISGARH

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The study was to assess the land management's and rehabilitation techniques carried out to the Jarhi (Bhatgaon) Coal mine area. These are sub mine area of Surajpur district which are prone for ecological imbalance. The sampling method was based on primary and secondary data collection during the research study in Coal mining area. It was found that deteriorating people and vegetation, reduced the number of flora, reduced the forest & agriculture land area and it constrained the farmer to migrate, this led to increased entropy in ecology of Jarhi (Bhatgaon) regions, causing an ecology imbalance. The key impact includes deforestation, degeneration and degradation of natural resources, environmental pollutions, health risk, ecological and socio-ecological instabilities. The magnitude of impact depends on the methods, scale and mining activity concentration, technological interventions etc. The mining activities resulted in an appreciable damage to natural vegetation and its dynamics. A long term strategy is essential for restoration and conservation of the fragile ecosystem of collieries. Because of large-scale destruction of natural areas due to mining operations, a restoration strategy is needed as a part of the overall mining management plan. In restoration, emphasis is given first to build soil organic matter, nutrients and vegetation cover to accelerate natural recovery process. Tree plantations can be used as a tool for mine spoil restoration as they have ability to restore soil fertility and ameliorate microclimatic conditions. We discuss here various approaches of ecosystem restoration on mine spoil, criteria for the selection of plantation species and future research needs in this regard.

Keywords: Ecological imbalance, Coal mining, Restoration.

A STUDY OF DIVERSE SCENARIO OF HINDI CINEMA

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On 3rd May 2013, Hindi cinema has turned 100 years old. This hundred years of history says a lot. This is not only the history of Hindi cinema, but also a mirror of social, political, economic, cultural policies, values and sensibilities of Indian society, in which the diversity and consciousness of Indian society comes to the fore. Cinema came to India from France, the Lumiere brothers demonstrated it in Mumbai in 1896. "Raja Harishchandra" (3 May 1913), directed by Dadasaheb Phalke, was India's first silent film. The decade of Hindi films from 1913 to 1960 centered on Films were made based on mythological and religious stories, social problems and idealism. "Alamara" (1931) produced by Ardeshir Irani was the first talkie film of India. Barsaat, Milan, Mother India were important films of this period. The decade of Hindi films from 1960 to 1990 was historical, dissatisfaction with the system, rebellion, realism and economic liberalisation. Mughale Azam, Sholay, Zanjeer, Mashaal, Ramteri Ganga Maili were successful films of this decade. In the decade of Hindi films from 1990 to 2010, films were directed keeping commercial interests, economic recession in the global scenario and political corruption in the center. It is clear that Hindi cinema has always been influenced by its surroundings. It is clearly visible even today in our films.

CURRENT STATUS AND FUTURE PROSPECTIVE OF NANOCARRIERS FOR CANCER TREATMENT: A REVIEW

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Lung cancer is the most common cause of cancer-related death in humans worldwide. Various cancer treatments are available to treat cancer but the main problem is that most are the toxic effects as well as diagnosis at an advanced stage. Pharmaceutical nanocarriers has become one of the most important areas of nanomedicine. Nanocarriers as drug delivery system have received much attention in recent years, especially for cancer treatment. Ideally, such carriers should be specifically targeted to the pathological area to provide the maximum therapeutic efficacy. Various nano systems have been developed to enhance the therapeutic effect of drugs as well as selective targeting and delivery of drugs to specific sites of cancer. Nanoparticle-based medicines and therapeutics is becoming more important in the treatment of different forms of cancers, especially lung cancer. Currently, many formulations of nanocarriers are utilized including lipid-based, polymeric and branched polymeric, metal-based, magnetic, and mesoporous silica. Most commonly nanocarriers are nanoparticles, liposome, Niosome, etc. This review summarizes current progress and challenges in nanocarriers based drug delivery systems for lung cancer management also discusses the importance of nanocarriers in the treatment of lung cancer and emerging nanoparticle therapeutics and their applications in detection, diagnosis, and cancer therapies.

CURRENT STATUS AND FUTURE PROSPECTIVE OF LUMINESCENCE IN PHARMACEUTICAL SCIENCES: A REVIEW

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Luminescence is the study of general laws of absorption and emission of radiation by matter. It occurs when an electron returns to the electronic ground state from an excited state and loses its excess energy as a photon. When the electromagnetic radiation in UV-visible region get interacts with a molecule causes transition among to the ground state to excited state then further relax back to the ground state. When it relaxes back to the ground state it emitted excess energy as a radiation. There are two type of luminescence: fluorescence and phosphorescence. There are various factors which affect the luminescence such as temperature, pH, dissolved oxygen and solvent. It is widely used in qualitative and quantitative analysis of inorganic compounds & also widely used in the fields of biochemistry and molecular biophysics. Amphetamine, codeine and morphine are analyzed in body fluids at wavelength 280 – 300 nm or at 340 nm using fluorescence spectroscopy. Vitamin a is used to analyze at maximum emission wavelength of 500 nm. Polyaromatic hydrocarbons in environmental samples are analysed at emission wavelength 580 nm. This review provides a general review on principle of luminescent reactions and their recent applications in pharmaceutical sciences. The structural requirements for luminescent reactions and the different factors that affect the efficiency of analysis are included in the review. Luminescence application in drug analysis is the new version for this review. medical diagnosis, medical science etc.

Keywords: Luminescence, Fluorescence, Phosphorescence, Emission, Absorption, Analysis, Wavelength, Qualitative and Quantitative.

GROWTH AND YIELD OF MEDICINAL PLANTS UNDER BAMBOO BASED AGROFORESTRY SYSTEM.

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Bamboos based agroforestry can play an important role in enhancing productivity, sustainability and resource conservation. Under agroforestry system, bamboos are also benefited due to sharing of resources like irrigation, fertilizers, weeding, etc. with intercrops; as a result the quantity and quality of bamboos are expected to be much higher as compared with monoculture and unmanaged plantations. Incorporation of medicinal plants with Agroforestry System will help to conserve them and restore the biodiversity and in turn it will generate not only income but also improve livelihood status of rural and tribal people. Keeping these important aspects in view, a systematic research trial was undertaken on Bamboo, intercrops with Kalmegh, Ashwagandha and Sadabahar with the following objectives viz; study the growth and yield potential of *Andrographis paniculata*, *Withania somnifera*, *Catharanthus roseus* under Bamboo- based Agroforestry system and comparative economics of different medicinal plants under bamboo based Agroforestry system.

CURRENT STATUS AND FUTURE PROSPECTIVE OF BURN WOUNDS HEALING: A COMPREHENSIVE REVIEW

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Wound healing is a complex, dynamic process supported by cellular events that must be tightly coordinated to efficiently repair damaged tissue. These activities offer the foundation for the mechanisms of wound repair. Successful wound care involves optimizing local and systemic conditions in combination with an ideal wound healing atmosphere. The basic steps of wound repair are prevention of wound infection, debridement of dead and dying tissue, removal of debris and contaminants, provision of adequate wound drainage, promotion of a viable vascular bed and selection of an appropriate method of closure. Various preparations and medications of organic, non-organic, biogenic, and phytogenic origin have been devised and used in the topical treatment of burns. Many different approaches have been developed to influence this wound environment to provide a protected, pathogen-free, and moist environment for healing. This review discusses the physiology, type and management of burn wounds and future prospective for this field.

Keywords: Burn wounds, wound healing, wound management

CURRENT STATUS AND FUTURE PROSPECTIVE OF NANOCARRIERS FOR CANCER TREATMENT: A COMPREHENSIVE REVIEW

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Pharmaceutical nanocarriers has become one of the most important areas of nanomedicine. Nanocarriers as drug delivery system have received much attention in recent years, especially for cancer treatment. Ideally, such carriers should be specifically delivered (targeted) to the pathological area to provide the maximum therapeutic efficacy. Among the many potential targets for such nanocarriers, tumors have been most often investigated. This review attempts to provide an overview of various nanocarriers in both research and clinical applications with a focus on various chemotherapeutic drug delivery systems for the treatment of cancer. The focus of review to summarize presently available information regarding targeted pharmaceutical nanocarriers for cancer therapy. Certain issues related to some popular pharmaceutical nanocarriers, such as nanoparticles, niosome, liposomes are different ways to target cancer via specific ligands and via the stimuli sensitivity of the carriers.

Keywords: Cancer, Cancer Treatment, Nanocarriers, Nanoparticles, Niosome, Liposomes.

CURRENT STATUS AND FUTURE PROSPECTIVE OF NOVEL APPROACHES FOR DERMAL AND TRANSDERMAL DELIVERY OF HERBAL DRUGS: A COMPREHENSIVE REVIEW

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Utilization of herbal bio drugs is increased worldwide because of their incredible therapeutic effects and negligible side effects as compared to the synthetic medicines. Delivery of herbal drugs as novel formulations faces hurdles due to difficulties in identification, processing, standardizing, extracting of herbal drugs with an intention to accomplish sustained and controlled release. However, delivery of herbal drugs has need of modifications with the intention to accomplish sustained and controlled release. Previously herbal drugs were not considered for development as novel formulations due to lack of scientific justification, processing, standardising, extracting and authentication difficulties. Now with the innovation in the technology, novel drug delivery systems unlock the door in the direction of the development of herbal drug delivery systems with enhancing bioavailability, therapeutic effect and reduced toxicity. Many novel carriers such as nanoparticles, liposomes, phytosomes, transferosomes, etc. have been reported for successful modified delivery of various herbal drugs. The aim of this review is to summarize various novel approaches, which have been developed for dermal and transdermal delivery of herbal drugs delivery to achieve better therapeutic response.

Keywords: Herbal Drugs, Drug delivery, Dermal delivery, Transdermal delivery, Phytosomes, Nanoparticle, Liposomes

A COMPREHENSIVE REVIEW REGARDING “ARTIFICIAL INTELLIGENCE” IN MEDICAL FIELD

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Artificial Intelligence (AI) is a collection of numerous technologies that work together to give robots the ability to see, understand, act and learn at levels of intellect comparable to that of humans. It has become more prevalent in many spheres of life most notably in medical field. Nearly every area of medicine has investigated the effectiveness of AI tools. The goal of AI is to imitate cognitive process in human's. Moreover it holds numerous of applications in medical area such as Clinical Trial Participation, Healthcare System Analysis, Targeted treatment in disease diagnosis. Its current applications focuses on Nephrology, Cardiology, Computational diagnosis of cancer in Histopathology, Neurology etc. without a question AI is developing quickly and becoming pragmatic everyday and has given us a rapid increase of it's capabilities. In near future Healthcare applications of AI will advance, as there is also a possibility of deriving prime details from a patient's electronic footprint. Overall, a short review on AI has been done accompanied by a discussion of AI, it's applications future use etc. has been highlighted.

Keywords: Artificial Intelligence, Robots, AI Tools, Disease Diagnosis, Computational Diagnosis, Medical Field, Current Applications.

MAJOR DRIVING FORCES OF ORAON TRIBE LANGUAGE KURUKH TO ENDANGERMENT IN SURGUJA DISTRICT OF CHHATTISGARH.

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The Kurukh (Oraon) speak a Dravidian language known as Kurukh, also known as Kurux, Oraon, or Uranw. It is most closely related to the Malto language and is spoken by about two million people in the Indian states of Chhattisgarh, Jharkhand, Odisha, West Bengal, Assam, Bihar, and Tripura as well as by 65,000 in northern Bangladesh. The language is marked as being in a "vulnerable" state in UNESCO's list of endangered languages. In order to study the driving forces of the endangerment of the language the research was conducted during January 2021 to January 2023. The data was collected through the semi structured questionnaire in which 150 randomly sampled Oraon of Surguja district were asked to fill up the questionnaire. The main objectives were (1) to study the impact of modernization on Oraon tribe's perception towards their language, (2) to study the traditional methodologies to conserve the cultural heritage. The major issue that the study revealed that there is a large-scale impact of modernisation and urbanisation on indigenous tribal areas as the maximum respondents entered that although modernization have helped improving economic status of tribes the age-old customs and traditions of the tribal groups have been rapidly eroding such as religious customs, language etc. Respondents also entered that Tribal customs and traditions come under pressure, due to contact with the town culture and a consequent change in the attitudes of the tribals especially youths, restricted use of the language in the family especially young generation. To conserve the traditional heritage maximum respondents entered there is a need of awareness among youth to respect their language, their culture.

Keywords: Modernization, Customs, Traditional heritage, Kurukh, Tribe.

ENHANCING SECURITY AND PRIVACY IN IOT WITH BLOCKCHAIN TECHNOLOGY: DISTRIBUTED LEDGERS AND INDUSTRY APPLICATIONS

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The impact of IoT on the creation of a common network image across different applications in modern life. The advancement of wireless sensor network devices has allowed for the exchange of data and various analyses, leading to the achievement of the common network image. However, there are security and privacy issues associated with the central server model used in IoT for data authentication and exchange. For instance, there is a possibility of device spoofing, incorrect authentication, and decreased data exchange dependability. To address these concerns, the central server model is dropped, and blockchain (BC) technology is introduced as a component of IoT to improve confidentiality and security. The study investigates how the distributed ledgers based on blockchain technology (DL-BC) can mitigate potential security and privacy concerns in the context of IoT component interaction. It also explores the application of BC in different industries and categories to comprehend the role of blockchain technology. Additionally, certain issues unique to IoT and IoT using BC are examined to gain a better understanding of how the technology can be effectively implemented.

Keywords: Internet of Things(IoT), Data Exchange, Data Authentication, Device Spoofing, Blockchain Technology, Distributed Ledgers.

RELIABILITY-CONSTRAINED PLANNING OF ELECTRIC DISTRIBUTION SYSTEMS WITH RENEWABLE ENERGY SOURCES AND AUTONOMOUS HYBRID MICROGRIDS

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The article discusses the importance of renewable energy sources such as wind and solar power in meeting a nation's energy demands. These sources are eco-friendly and do not consume fossil fuels. However, the stochastic nature of these sources and equipment failures can cause uncertainty in the electric distribution system (EDS). To address this issue, the article focuses on reliability-constrained planning of EDS, considering the stochastic nature of sources and uncertainty. The article studies the real power flows among autonomous hybrid microgrid test systems developed using different combinations of DG units. The impact of integrating non-dispatchable DG units on the power flows of hybrid microgrids is also analyzed. The article proposes methods to enhance the reliability of autonomous hybrid microgrids by synchronizing other microgrids along with Battery Energy Storage Systems (BESS) units. The proposed methods are validated through computer-aided simulation using MATLAB, and the results show satisfactory performance.

Keywords: Renewable energy source, Eco-friendly, Energy Demand, Electric distribution system.

A STUDY ON CYBERCRIME AGAINST WOMEN AND CHILDREN AND ITS REMEDIES

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The rapid increase of technology and the widespread use of the internet has led to an alarming rise in cybercrime against women and children. In recent years, these crimes have become a significant concern for law enforcement agencies, policymakers, and society as a whole. This research paper aims to investigate the various types of cybercrimes that affect women and children, including cyberstalking, cyberbullying, Mental Cruelty, sextortion and child grooming. The study uses both qualitative and quantitative research methods to analyze data from surveys, interviews, and case studies. The findings suggest that cybercrime against women and children is a growing problem that affects individuals, families, and communities. The study also identifies various factors that contribute to the vulnerability of women and children to cybercrime, including their lack of awareness, inadequate legal protection, and social and cultural norms. Based on the analysis, the paper proposes a range of remedies to combat cybercrime against women and children. These include educational programs to raise awareness about cybercrime and its impact, better enforcement of existing laws, and the development of new legislation to address gaps in the legal framework. The paper concludes by emphasizing the importance of collaboration between various stakeholders, including law enforcement agencies, policymakers, educators, parents, and civil society organizations, to create a safer and more secure digital world for women and children.

Keywords: Cybercrime, Legal Protection, Law enforcement.

A COMPREHENSIVE ANALYSIS OF THE RESEARCH ON BLOCKCHAIN TECHNOLOGY AND ITS POSSIBLE APPLICATIONS

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The BT has the potential to significantly alter all aspects of human life and may have a huge impact in the next decades. This technology has changed the way we perceive business operations and has reshaped our current economy. The BT is a peer-to-peer decentralized immutable public database technology that has altered the administration of numerous systems and was created 2008 via the digital currency or cryptocurrency known as Bitcoin. Since the idea was created in 2008, there has been an increase in interest in BT. The reason for the fear in BT is because of its Decentralized and Distributed characteristics, which provide security, privacy, and data integrity with no intermediary agency on top of things. Blockchain is increasingly being utilized for registering, authenticating, and verifying digital assets and transactions, controlling interactions, recording data, and managing IDs among various parties in a highly trustworthy, decentralized, and secure manner. A phrase that often comes up while discussing Blockchain is Bitcoin. Many people still mistake Blockchain with Bitcoin; nevertheless, both are distinct. Bitcoin is only one of the apps that makes advantage of BT. In this review article, we outline the concept of Blockchain, as well as its applications, advantages, and disadvantages.

Keywords: BlockChain, Bitcoin, Cryptocurrency

ANALYSIS OF INTERNET OF THINGS APPLICATION'S SAFETY AND CONFIDENTIALITY OF DATA CONCERNS IN MODERNITY

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The Internet of Things (IoT) landscape includes more devices with every passing day. In future technology will enable items to be linked to the web to interact with other things to create self-configuring intelligent systems. It is referred to as the IoT. In future era the world could expect around 64 billion IoT devices in use. The growth in the number of IoT devices is beneficial with a major transformation in the ways for carrying out everyday activities. The number of IoT devices is quite large. IoT devices are typically dispersed across the globe, allowing for instant communication between connected devices. As a result of the collecting, passing and sharing of data among these networked devices and data recipients there is a concern among security and privacy experts about how this data is collected, shared and used in addition, IoT devices and their networks are increasingly becoming a prime target for cybercriminals which has resulted in the breach of data security and privacy. The main problem that needs to be resolved at each IoT phase but has not been finished is the confidentiality and safety problem. The most dangerous part of IoT is that consumers are surrendering their privacy, bit by bit, without realizing it, because they are unaware of what data is being collected and how it is being used. As mobile applications, wearables and other Wi-Fi-connected consumer products replace “dumb” devices on the market, consumers will not be able to buy products that cannot track them. It is normal for consumers to upgrade their appliances, and it most likely does not occur to them that those new devices will also be monitoring them. There have been many research efforts that offer solutions to security-related problems. To safeguard the IoT, an encryption infrastructure that covers all layer-security issues is required. This paper reviews the worries and issues related to safety and confidentiality in the Internet of Things. It also highlighted several potential solutions and security issues relevant to the IoT scenario.

Keywords: Internet of Things (IoT), Wi-Fi, Cyber Criminal, Intelligent System.

THE INTERNET OF THINGS AN INNOVATIVE APPROACH FOR FUTURE TECHNOLOGICAL ADVANCEMENT

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The Internet of Things (IoT) is a new paradigm that has transformed traditional lifestyles into high-tech ones. Smart cities, smart homes, pollution management, energy savings, smart transportation, and smart industries are examples of IoT changes. Many important research studies and investigations have been conducted in order to improve technology through IoT. However, there are other problems and concerns that must be solved before IoT can reach its full potential. These difficulties and issues must be addressed from a variety of perspectives, including applications, challenges, enabling technologies, social and environmental implications, and so on. The primary purpose of this review article is to give a thorough explanation from both a technological and a social standpoint. The essay highlights several IoT problems and critical issues, as well as architecture and key application fields. In addition, the essay highlights current literature and illustrates its contribution in many facets of IoT. Furthermore, the significance of big data and its analysis in relation to IoT has been explored. This article will assist readers and researchers in understanding the Internet of Things and its use in the real world.

Keywords: Smart cities, Smart Transportation, Critical issues, social standpoint

PROSPECTS AND POTENTIALS OF APICULTURE IN SURGUJA DISTRICT OF CHHATISGARH

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Apiculture offers tremendous potential for generating revenue, pollination, and using forest resources sustainably. In addition to its use as a natural sweetener, honey is used as an anti-inflammatory, antioxidant, and antibacterial agent. People frequently use honey topically to treat burns and promote wound healing. The domestication of the Indian honey bee, *Apis cerana indica*, was very common but unrecognised; nonetheless, bee hunters also used this strategy to gather honey from *Apis dorsata*, a giant bee, i.e. by burning of the colony. In an effort to train bee hunters about the scientific honey harvesting process, the state forest department invited experts from the Central Bee Research and Training Institute, Pune. Many of the volunteers began beekeeping, but many of them were reported to have stopped for a variety of reasons. So a study was carried out in the Surguja District of Chattisgarh in the years 2022-2023 to document the difficulties in the existing beekeeping prospects and its potential resolution. Interviews, surveys, and field observations were all used in the study to find the answers to the research question. Results analysis reveals that a variety of natural enemies, insect-pests including Ants, Wasps, Moths, Beetles, birds, mites, etc. were the main cause of honey bee colony damage and mortality, which lowers the honeybee output of honey, bees wax, royal jelly, propolis, and pollen grains. Additionally, negligent beekeeping management made bees more vulnerable to assaults from predators. The bee keepers adhered to customary cleaning procedures and understood the significance of the bee hive's health and hygiene. Clean up the bottom board. To decrease hive entrance, seal off cracks and crevices in the hive.

Keywords: nutritional composition, domestication, employment, predators, natural sweetener

ROLE OF IOT & MACHINE LEARNING TO LEARNING ADVANCE EDUCATION IN INDIA: A REVIEW OF LITERATURES

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There have been many changes in the present day Education Systems in India, today the traditional education or teaching method is being rapidly converted into completely new methods, this work is done very fast only after the invention of the computer and its practice in India. It is going on. At present, courses related to computer knowledge are being included from schools to colleges, In which teaching is being done by including necessary and useful computer software as a subject, due to which efforts are being made to bring quality to the students along with ease of learning and understanding .Today, there are many such software regarding various computer related software, which has made human life very easy, including software like Internet, Networking, Cloud Computing, Artificial intelligence, Machine learning, Internet of things. Currently Internet of things technology is being used a lot. What does man think?, how does he think? And a technology has been developed based on his ideology and based on the platform of the Internet, using which it is being used for the purpose of completing the deficiency in the absence of human beings.

Keywords: Internet of Things, Networking, Cloud Computing, Artificial intelligence, Machine learning.

IN-SILICO SCREENING OF SEVERAL PLANT BIOACTIVE COMPOUNDS HAVING SNAKE ANTI-VENOM POTENTIAL

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A crucial global health dilemma, snakebite is often neglected. People from rural areas often take inappropriate pre-treatment losing their critical time to get to a treatment center. The study was focused on some ethnomedicinal plants that could be utilized for the treatment of snakebites. Five ethnomedicinal plants viz. *Andrographis paniculata*, *Aristolochia* spp., *Hemidesmus indicus*, *Perilla frutescens*, and *Tabernaemontana catharinensis* used traditionally for snakebite treatment, particularly in the northern region of Chhattisgarh were selected and their potential bioactive compounds viz. Andrographolide, Aristolochic acid, Lupeol acetate, Rosmarinic acid, and 4-methoxysalicylic acid were identified. Molecular docking have been performed between several plant phytochemical compounds and various fatal snake venom proteins using Autodock and PyMOL, which yielded different binding affinity scores based on the interaction between protein and ligand. As per this study, Lupeol acetate from *Hemidesmus indicus* showed the best binding score with several proteins of PLA2 (-8.5 to -11.4), 3FTx (-6.5), and KUN (-6.6) families from different venomous snakes (more efficiently against *Echis carinatus* snake). As the phytochemicals of plants showed good affinity against some venomous snake's fatal protein, thus it could be used as a therapeutic candidate for specific snakebite treatments, and the reported particular plants could be used as life-saving from snakebite, especially in rural areas.

Keywords: Snakebite, Phytochemical, Molecular docking, Autodock, PLA2, Bioinformatics, Computer-aided drug designing.

STANDRIZATION OF STERILIZATION PROCEDURES AND MEDIA COMPOSITION FOR BUD BREAKING IN BAMBOO

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Bamboos are permanent evergreen woody monocots belonging to the family Poaceae and subfamily Bambusoideae and tribe Bambuseae. Know that Bamboos take a vital part in common Indian people. For the large-scale production of bamboo different kinds of propagation techniques are presented but these traditional techniques go through serious drawbacks for large or mass-scale propagation. The aim of the study was the production of bamboo plants by micropropagation from nodal segments (A region on the stem from which a leaf-bearing axillary bud arises.) Major aim of this study was (1). Standardization of various sterilization conditions for the treatment of explants (2).Effect of different plant growth regulators on the bud breaking of bamboo. The most suitable result on surface sterilization was obtained when nodal segments of Bamboo are surface sterilized with 0.5% HgCl₂ for 5 min which resulted in 75 % contamination-free explants. The present work tried a lot of combinations of different Kinds of sterling with different concentrations. The greatest results were obtained from mercuric chloride treatments and also with gentamicin. Explants were treated with a solution containing bavistin (1% w/v), and gentamicin (0.5% w/v) for 20 minutes, followed by immersion in 0.1% mercuric chloride for 10 minutes. Standardizing the explants treatment protocol for bamboo under the present study successfully achieved the desired goal in this work. Study was designed a comprehensive protocol for the bud breaking of bamboo by using nodal segments. Used semi-solid M.S. medium with different kinds of growth regulators like BAP and KN combination for shoot generation. 6 + 2.5 mg/l BAP+KN were found to be most effective for straight shoot induction. With this concentration 80 to 90% of explants responded to shoot induction. Highest number of shoots observed was (7) obtained within 20 to 25 days of culture. Present study, complete regeneration was successfully achieved from the node segment of bamboo.

Keywords: bamboo, micropropagation, sterilization, ms medium, BAP, KN, gentamicin, shoot

ISOLATION OF NITROGEN FIXING BACTERIA FROM RHIZOSPHERE OF PIGEON PEA (CAJANUS CAJAN) PLANT OF AMBIKAPUR REGION SARGUJA CHHATTISGARH INDIA

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Plant faces various climatic challenges that impact its growth and development. The microbiome present in the rhizosphere interacts with plant and promotes growth by secreting various hormones and metabolites. Hence, the present investigation was carried out to isolate the nitrogen fixing bacteria from the rhizosphere soil of pigeon pea plant obtained from agriculture field Ambikapur, Surguja, Chhattisgarh. Pure colonies of 3 Nitrogen fixing bacterial strains have been isolated on nitrogen free selective media (Burk's media). Nitrogen fixing bacterial colonies were successfully isolated, characterized morphologically and colony forming unit (CFU)/g of soil for one tenth dilution factor was calculated 1×10^3 CFU/g. Morphological characterization of nitrogen-fixing isolates obtained in the present study will certainly provide future prospects to identify novel strains that can be bioprospect further to achieve greater production of pulses.

Keywords: Rhizosphere, Selective media, Microbiome, Nitrogen fixing bacteria

ECONOMICALLY AND TRADITIONALLY IMPORTANT NON-TIMBER FOREST PRODUCTS (NTFPS) OF CHHATTISGARH

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The study was carried out at three different haors of Sunamganj district to evaluate the status and variability of the Physico-chemical properties of soil. The properties of soil such as moisture content, texture, pH, electric conductivity, organic carbon and organic matter, available N, P, K, Mn and Fe were determined and analyzed following standard method and the soils from three different haors showed nutritionally fertile. The studied soil was dominated by Loam along with Clay loam and slightly acidic with a mean pH value 5.93 ± 0.42 . The N content was low and ranged from 0.025 to 0.392%, but the organic carbon ($0.61 \pm 0.09\%$) and organic matter ($1.05 \pm 0.16\%$) seemed higher. Accumulation of organic matter is an indication of a functional wetland. Concentration of available P, Mn, K and Fe was $0.82 \mu\text{gg}^{-1}$, $57.84 \mu\text{gg}^{-1}$, $115.03 \mu\text{gg}^{-1}$ and $261.85 \mu\text{gg}^{-1}$ respectively. The nutrients of the soils seemed to be at a balanced condition with a variation among sites, seasons and haors for the successful growth of the plant.

Keywords : Ntftp, Physico-chemical properties, electric conductivity.

FARM BUSINESS MANAGMENT: SCOPE,CHALLENGES AND FEATURES PROSPECTIVES

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By using engaging techniques such as worked examples to fully explain the complex decision making tools necessary for this discipline. Management comes under Micro economics. It concentrates on the study of individual farm; hence, it comes under Micro- economics. Farm Management covers the aspects, like efficiency of the crop kind of crops to be grown, the doses of fertilizers to be given, the implements to be used etc. There are increasing pressures from climate change, soil erosion and biodiversity loss and from consumers' changing tastes in food and concerns about how it is produced. And the natural world that farming works with – plants, pests and diseases – continue to pose their own challenges. Farm management is the art or applied science of organizing and operating a farm firm in a manner that satisfies the goals and objectives of the principles involved. Budgets, linear programming, farm record analysis, game models, and conventional economic models do not provide prescriptive answers, but have been used to enhance management by helping predict the probable outcome of alternative actions by showing the range of possible outcomes from which management can make a choice.

Keywords: plant pests, diseases, climate change, soil erosion.

ECONOMIC AND MEDICINAL IMPORTANCE OF PONGAMIA PINNATA (KARANJ)

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Pongamia pinnata is a legume tree with seed containing oils and fatty acids suitable for biodiesel production. It is a fast-growing evergreen tree which reaches 40 feet in height and spread, forming a broad, spreading canopy casting moderate shade. The glossy green leaves are briefly deciduous, small clusters of white, purple, and maturing into brown seed pods. The tree is well suited to intense heat and sunlight and long taproot make it drought tolerant. The dense shade it provides slows the evaporation of surface water and its root structures promote nitrogen fixation, which moves nutrients from the air into the soil. The tree grows wild on sandy and rocky soils. Although all parts of the plant are toxic and will induce nausea and vomiting if eaten, the fruits and sprouts, along with the seeds, are used in many traditional remedies. Juices from the plant, as well as the oil, are antiseptic and resistant to pests. As the biodiesel industry grows, honing a cost-effective and diverse feedstock supply stands out as a top challenge. There is a need to diversify the sources and methods used to generate biofuel products to achieve food security, energy security and sustainable development and carbon savings. Biodiesel producers are looking for alternative feedstocks which are non-agricultural and non-food crops. And *Pongamia pinnata* as the ability to substitute the requirement of low cost feedstock with the potential for high oil seed production and the added benefit of an ability to grow on marginal land. These properties support the suitability of this plant for large scale vegetable oil production needed for a sustainable biodiesel industry. Seeds yield fatty oil, Pongam oil, used in tanning industry for dressing E.I. leathers; it also finds use in the preparation of washing soaps, and candles, and as a lubricant for heavy lathes, chains, enclosed gears and heavy engines, and bearings of small gas engines. Medicinally, it is applied in herpes, scabies, leucoderma, and other cutaneous diseases. Internally it is used in dyspepsia with sluggish liver. Karanj is the active principle. Juice of roots used for cleansing foul ulcers and fistulous sores and for cleaning teeth and strengthening gums.

Keywords: Medicinal, Biofuel, Sustainable development.

ROLE OF WOMEN IN FOREST RESOURCE MANAGEMENT

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Women play an important role in the forests of our country. They have a significant impact on conservation and management of forests. Collection of forest products to meet subsistence requirements and also to augment family's income is generally the responsibility of women. Awareness about trees, shrubs and grasses is higher amongst women than in men because women devote more time than men to collect forest produce to meet family needs. Sustainable forest management offers a holistic approach to ensure forest activities deliver social, environmental and economic benefits, balance competing needs and maintain and enhance forest functions now and in the future. Having preserved over 50 acres of forest land, the women are determined to protect the forest that supports their survival. This conservation approach has been around longer than India's Forest Rights Act. It began in Nayagarh in the 1970s, when a group of women brought a timber thief to justice. Women are considered as a weaker section of society, but they play a significant role in raising voice against environmental degradation with the advancement of education and technology. Women in India largely visible in the movement against deforestation and in conserving water resource. Therefore, Women should be involved in each and every activity related to forests.

Keywords:- Sustainable forest management, environmental degradation, deforestation.

FOREST REGENERATION: A KEY TOWARDS SUSTAINABLE FOREST MANAGEMENT

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Forest regeneration reflects the overall forest health and its sustainable development. The natural balance of the forests ecosystem is depends upon the natural capability of the vegetation stands to regenerate, establish and maintain their population in a given environmental condition. The various perturbation caused by the environmental factors in addition to the anthropogenic disturbances has drastically alters the forest composition, structure and overall diversity of the biota It is concluded that, overall, sustainable forest management and the ecosystem approach express similar goals and ambitions for forest management, focusing on environmental, social and economic sustainability and on generating and maintaining benefits for both present and future generations. The deforestation and forest fire are the major cause towards biodiversity loss as well as affecting the forest regeneration which changes the future forest stand to a great extent. Therefore, the management, conservation and scientific protection of the forest are the essential steps towards conserving the species for future generation. In this context, sustainable forest management seems to be promising tools and approach to manage these valuable forest on a sustainable basis. The scientific exploration of the species for various ecological zones as well as forest types needs to be done towards prioritizing the species adaption range, conservation priority and ecological amplitude. Moreover, the afforestation and reforestation programs using the potential species of the region can accelerate the forest cover development as well to meet the national target to achieve the sustainable goals.

Keywords: Regeneration, sustainable forest management, ecosystem approach, forest conservation.

ECO-FRIENDLY NANOMATERIALS FOR ENVIRONMENTAL POLLUTION REMEDIATION

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It always attains a significant attraction for the researcher to grow new nanomaterials for the remediation of the environment for sustainable development. In this perspective, green synthesis is an appreciated technology due to no hazards synthetic protocol. In green synthesis, the use of plant extract and microorganism make it biocompatible and eco-friendly. Green nanomaterials have many valuable applications like nanomedicine and pharmacological. Along with therapeutic and medicinal use, it is also used for remediation of the environment and making contamination-free soil, air, and water as a nano-adsorbents, nano-adsorbents, nano- photocatalyst, nano-filters, magnetic nanomaterials, nanosensors, etc. As a result, eco-friendly nanomaterials have the potential to provide solutions to clean up soil and air pollution, as well as remove water contamination, while also outperforming traditional technology for environmental remediation and sustainable development.

Keywords: nanomaterials, green synthesis, Green nanomaterials

VALORISATION EFFICIENCIES OF FRUITPEELS FOR OPTIMUM XYLANASE PRODUCTION

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Agroindustrial wastes comprise of variety raw materials of which fruit peels form a major fraction. Fruit peels are nutrient rich yielding value added products by appropriate recycling bioprocesses strategies. The recycling has an added benefit of ecofriendly decomposition of the waste material which otherwise generate environmental hazards. Solid state fermentation is gaining importance as a method for valorization of the AIRM for enzyme production. The presence of lignocellulosic content requires hydrolysis which offer resistance and pose a difficulty in its easy fermentative biotransformations. The fruit peels selected were Pomegranate, Orange, Pineapple, Sweet lime and Banana peels for the study of the valorization susceptibility and enhanced rate of growth accompanied by increased yield. The analysis of Water Absorption Index, apparent density and growth rate supported by the AIW was performed. One way ANOVA and Correlation analysis was performed between the investigated parameters. *Aspergillus flavus* NFCCI4565 was used for valorization studies and xylanase production. The maximum xylanase production (46.61 ± 0.008) IU/ml on day 5 of fermentation was recorded. Maximum growth was supported by pomegranate peel followed by orange peel. The pomegranate peel exhibited least Water Absorption Index (3.04 gel/g dry wt) and maximum apparent density 4.86 cm^3 , maximum biomass and highest xylanase production of 80.2 IU/ml. Statistical analysis revealed a positive correlation between the apparent density and Biomass, apparent density and Xylanase production. The present study revealed important fermentative capacities of their applicability for production of value-added products.

Keywords: Xylanase, valorisation, Fruitpeels, Water absorption index, Apparent density

A STUDY ON THE USE OF MACHINE LEARNING APPROACH TO FORECAST STOCK PRICES.

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Every day, market factors (direct or indirect) affect stock prices (buy and sell). One of the biggest concerns in recent years has been the forecast of stock prices. Investors make stock market investments based on predictions. Investors in the stock market use a variety of strategies and tactics for price prediction in order to maximise their earnings and reduce their risks. Stock price predictions frequently involve machine learning techniques. This review paper addresses several machine learning techniques (supervised and unsupervised) and ways for investors to learn whether stock values are rising or falling. Data acquisition, dataset pre-processing, feature extraction, feature-based stock price prediction, and result presentation were the five stages of the procedure. Historical data is initially gathered from various financial sites. Pre-processing is the second step, when inaccurate, duplicate, and junk data are removed. In the third step, data sets are reduced and meaningful data are chosen. In the fourth step, predictions are made utilising various machine learning methods, including supervised and unsupervised learning techniques. In the end, many methods are analysed in the final step to determine correctness.

Keywords: Stock Price Prediction, Stock Forecasting, Machine Learning Techniques.

OPTIMIZATION OF BETA GALACTOSIDASE BY LACTOBACILLUS SPP. USING BOX BENKEN DESIGN

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β -galactosidase, commonly known as lactase has been used in industries for the preparation of lactose-free milk and for the conversion of lactose to prebiotic galacto-oligosaccharides (GOS). In present study, Box Behnken (BB) design was used to optimize the cultural parameters provided for β -galactosidase production. The incubation temperature (37 °C), Lactobacillus culture and milk was used as parameters under investigation for optimization. The similarity was observed between the predicted and experimental results which reflects the high accuracy of the Box Behnken model under the optimized condition. This is one of the advantages of applying experimental designing that considers the interaction of independent variables and provide a model to search for the nonlinear nature of the response in a short-term experiment. The similarity was observed between the predicted and experimental result reflects the high accuracy of the Box Behnken model. the optimum production of beta galactosidase was 45.37.

keywords: Beta galactosidase, Box Behnken Design, Lactobacillus

EVALUATION OF I MOBILIZATION EFFICIENCIES OF DIFFERENT MATRICES BY ASPERGILLUS NIGER

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I mobilization is an industrially important process in enzymes technology the recycling of bio catalyst is economical saving and renders the process user friendly the present study forces on evaluation of different matrices for their immobilization efficiencies aspergillus niger as a test organism the matrices were PUF, scotch brite and steel sponge the best I mobilization was exhibition by PUF

Keywords: Aspergillus niger, Matrices, Immobilization

MACHINE LEARNING METHODS AND ITS APPLICATION

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Machine learning is a science which was found and developed as a subfield of artificial intelligence in the 1950s. The first steps of machine learning goes back to the 1950s but there were no significant researches and developments on this science. However, in the 1990s, the researches on this field restarted, developed and have reached to this day. It is a science that will improve more in the future. The reason behind this development is the difficulty of analysing and processing the rapidly increasing data. Machine learning is based on the principle of finding the best model for the new data among the previous data thanks to this increasing data. Therefore, machine learning researches will go on in parallel with the increasing data. This research includes the history of machine learning, the methods used in machine learning, its application fields, and the researches on this field. The aim of this study is to transmit the knowledge on machine learning, which has become very popular nowadays, and its applications to the researchers.

Keywords: Machine Learning, Machine Learning Algorithms, Artificial Intelligence, Big Data.

FOREST FIRE AND MANAGEMENT

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Forest fires are considered as one of the most widespread hazards in a forested landscape. They have a serious threat to forest and its flora and fauna. Unplanned and abrupt forest fires are a major cause of forest degradation, while a controlled fire to manage and check the spread of unwanted forest fires serves as the action to improve the forest. There are several tangible as well as intangible losses due to forest fires, and they cause an environmental threat to the affected area. Some of the important SLFM actions for the prevention and control of forest fires were identified as follows: Identification of fire-prone areas and its mapping. Compilation of data on forest fire damage.

Development and installation of danger rating tools for forest. Development and deployment of forest fire forecasting systems.

Activities related to forest protection to be made part of planned activity to ensure allocation of budget.

Preventing measures to be ensured well before the fire season (i.e., summer).

Designation and appointment of nodal officer to coordinate with various agencies on forest fire-related issues.

A “fire control committee” to be constituted at each of the levels, namely, block, district, and state headquarters, for the monitoring as well as control of the fire. They should be entrusted with sufficient resources to fight fire incidences.

Communication network should be in place for ensuring timely flow of information, manpower, and materials to fire sites.

JFM or similar committees should be trained and engaged for the forest fire control and management. Specially, people living near to the forests must be an integral part of such committees.

Regular training of forest staffs and other fire protection committee members should be organized to update the participants on new information and tools to safeguard forests from fire.

Public awareness should be done to protect forests from fires. Stringent legal actions to be ensured for the prevention of forest fires.

Keywords: SLFM, JFM, forecasting.

NANO TECHNOLOGY BASED IMPROVED BIOCHAR AND ITS APPLICATION IN CARBON SEQUESTRATION AND WASTE MINIMIZATION

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The amount of CO₂ emissions exceeds the Earth's capacity to absorb carbon through the natural carbon cycle each year. Therefore, it is desirable to create effective, commercially viable CO₂ sorptive materials. Biochar, which is a porous carbon-based material, has been regarded as one of the most promising CO₂ sorptive materials. The use of biochar in agricultural techniques and for environmental remediation has shown to provide a variety of benefits. Biochar is widely regarded as an effective method of carbon sequestration. With the advancement in nanotechnology, researches have been conducted on the generation of nano-biochar (N-BC) for soil and agricultural applications in a sustainable way. By using a variety of physical and chemical activation techniques, biochar, may readily be scaled up into nano biochar (N-BC), which has a wide range of applications in many industries. Thus, multiple strategies were attempted to transform biochar (B-BC) to nano biochar (N-BC) with desirable properties and broader applications in environmental, agricultural, and other areas. N-BC offers considerable opportunities especially for the remediation of hazardous contaminants as well as the improvement of crop productivity. This review paper is an extensive compilation on the approaches of biochar production and it's varied applications in the field of plant growth improvement, phytoremediation, organic pollutant removal, energy production, biofuel, carbon sequestration and mitigating climate change.

Keywords: Nanobiochar, CO₂ sequestration, adsorbent, waste remediation.

SOME RESULTS ON PROJECTIVITY AND INJECTIVITY OF INTUITIONISTIC FUZZY MODULE

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In recent years, intuitionistic fuzzy sets (IFS) have generated a great deal of attention because they are more flexible and realistic than traditional fuzzy sets. In this context, intuitionistic fuzzy modules have been proposed to extend the concept of a fuzzy module to the intuitionistic fuzzy environment. The notions of projectivity and quasi-projectivity of an intuitionistic fuzzy G-module were proposed in the current work, along with a requirement on finite dimensional G-modules for the projectivity of one intuitionistic fuzzy G-module over another. In the present study we define various operations on these intuitionistic fuzzy relations, study certain characteristics, and describe the projectivity of an intuitionistic fuzzy G-module with regard to the quotient intuitionistic fuzzy G-module of another G-module. This study shows that the concepts of projectivity and injectivity are strongly related in intuitionistic fuzzy modules and that there is a close connection between projective and injective intuitionistic fuzzy modules. The findings of this research show the relation between the projectivity and quasi-projectivity of intuitionistic fuzzy G-modules, and they may have implications in fields including pattern recognition, control systems, and decision-making.

Keywords: projectivity, quasi-projectivity, intuitionistic fuzzy sets, Model operators, normalization

AUTOMATED STOCK MARKET FORECASTING THROUGH NATURAL LANGUAGE PROCESSING AND DEEP LEARNING TECHNIQUES

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This study proposes a novel approach to stock market forecasting using natural language processing (NLP) and various deep learning techniques. The study aims to develop an automated system that can extract valuable insights from news articles, social media, and other unstructured text data, and use these insights to make accurate stock market predictions. The system utilizes a combination of NLP techniques, including sentiment analysis and named entity recognition and topic modeling to extract relevant information from the text data. It also employs deep learning techniques such as convolutional neural networks (CNN) and long short-term memory (LSTM) networks to analyze the data and make predictions. The proposed system was tested using a large dataset of financial news articles and social media posts, and the results demonstrate its ability to accurately predict stock market trends. The study has important implications for investors, financial analysts, and policymakers, as it provides a powerful tool for making informed investment decisions based on real-time analysis of market trends.

Keywords: Deep Learning, Natural language Processing, CNN, LSTM, Sentiment Analysis.

THE IMPACT OF 4IR TECHNOLOGY ON ORGANIZATIONS PERFORMANCE: A CASE OF OOREDOO COMPANY

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Since the existence of humanity on the face of the earth, humans have devoted themselves to making use of what God created for them on this earth, according to what he helps and prepares for him the means of life. The Fourth Industrial Revolution, commonly referred as 4IR, describes the current automation and data exchange trend in manufacturing and other industries. It refers to the integration of physical, digital, and biological systems that lead to a new level of technological advancement and industrial transformation. This study evaluates the impact of 4IR technologies in Ooredoo company specifically in telecommunication sector. Additionally, it also investigates the challenges, opportunities, and performance of 4IR technologies. We will use mixed approaches, qualitative and quantitative to achieve the research aim, which is to find the impact of the 4IR technology in organization performance. As a result, we will propose recommendations for Oman organizations to manage and apply 4IR technologies to improve their performance

Keywords:4 IR, Physical, Digital, Biological

INVESTIGATING THE IMPACT OF TOURISM ON THE ECONOMY AND CULTURAL HERITAGE OF OMAN

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The significance of tourism for the global economy has increased and Oman acknowledges its potential as a key contributor to economic growth. To address this issue, as part of a research to analyze the influence of tourism on Oman's economy and cultural heritage, a survey will be carried out. The objective is to investigate the impact of tourism on Oman's economy and cultural heritage is to develop policies and practices for sustainable tourism in Oman is to gain a better understanding of the benefits and drawbacks of tourism. This research is valuable as it can offer valuable information on the pros and cons of tourism and can help shape sustainable tourism policies and practices in Oman. The study is significant because it can provide insights into how tourism affects Oman's economy and cultural heritage and can help guide the development of sustainable tourism policies and practices in Oman. On the other hand, the negative impact of tourism on Oman's economy and cultural heritage such as degradation of historical sites, and loss of traditional practices will also be discussed. The research will also discuss certain limitations such as reliable data and time.

Keywords: tourism, cultural heritage, sustainable tourism

ACCURACY TO PREDICT THE GENETIC RISK OF MYOCARDIAL INFARCTION USING CLASSIFICATION TECHNIQUES

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In this paper we find the accuracy to predict the various generic risks for myocardial infarction using various classification techniques. Myocardial Infarction (MI) also known as heart attack is one of the most dangerous cardiovascular diseases. In this study we calculate the accuracy of Myocardial Infarction prediction system is developed using various classification techniques where Byes Network Classifier gives the highest accuracy 96.55% and 10 fold cross validation technique by using data mining classification tool WEKA to classify the UCI repository data set .Doctors may sometimes fail to take accurate decisions while diagnosing the type of heart disease of a patient, therefore Myocardial Infarction prediction systems which use machine learning algorithms assist in such cases to get accurate results.

Keywords: Myocardial Infarction, decision tree, knn, Supervised Learning, data mining, classification, machine learning, data set.

COMPOSITE LINEAR FEEDBACK SHIFT REGISTER CIPHERS AND THEIR ANALYSIS.

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In this paper we provide an in-depth analysis of composite linear feedback shift register based stream ciphers. Linear feedback shift registers are used in cryptography and other applications to generate pseudorandom or pseudo-random-noise sequences. Stream ciphers used in many applications especially mobile communications are based on a combination of linear feedback shift registers, many of which involve using the exclusive OR operation to combine outputs from the individual linear feedback shift registers. In this paper we examine some of the commonly composite LFSR methods. We propose a new composite linear feedback shift register cipher that can accommodate several linear feedback shift registers without degradation to efficiency and security. The proposed composite LFSR ciphers which we termed XA composite LFSR have been found comparable to existing composite LFSRs, especially with their ease of implementation.

Keywords: Stream ciphers, linear feedback shift registers, composite LFSR.

DIVERSITY OF ENDOPHYTES IN INDIAN FOREST TREES: A SHORT REVIEW

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Nearly every plant harbors bacterial endophytes in their inner tissues. Endophytes share an intimate relation with their host plants. Endophytes colonize the host plant's internal tissues and establish a number of different interactions which includes; symbiosis, mutualism, commensalism, etc. Endophytes play an important role in promotion of plant growth and development. Contact between plants and their endophytic counterpart helps the plants to efficiently survive in adverse environmental conditions by fixation of atmospheric nitrogen, solubilization of phosphorus, potassium, production of phytohormones, ammonia, hydrogen cyanide and siderophores and diminish the growth of pathogenic microbes by antagonistic activity. Housing of endophytes begins with colonization of rhizosphere followed by establishment in the plant endosphere. The process is accomplished using a complex machinery including motility, binding with plant surface, polymer degradation, and plant defense evasion.

This review mainly highlights endophytic biodiversity by cross-sectional analysis of previously reported literatures and reviews containing data on endophytes in context of Indian forests. Interestingly, To make a comprehensive report on endophyte diversity from Indian forest trees we compiled results from 1000 published studies from Pubmed since 1992 to till now. Studies are parsed by taxonomy fungal diversity is dominant as compared to bacterial diversity. It was found that research interest in endophyte diversity is on the rise, with a sharp increase in studies per year since 2017. Also there is a significant diversity among the endophytes across the length and breadth of the Indian subcontinent.

Keywords: Endophytes, Plant Development, Nitrogen Fixation, Phytohormones, Colonization.

IN SILICO SCREENING OF PHYTOCHEMICALS FOR THEIR ANTISCORPION VENOM ACTIVITY

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Venomous scorpion stings are very common global health concern, particularly in the tropical and subtropical regions. Scorpion stings are responsible for a wide range of symptoms including localized pain, swelling, redness at the sting bite and may include muscle spasms, breathing difficulties and sometimes, even death in severe cases. The antivenoms available for affordability, accessibility and feasibility of available antivenoms are a major challenge in treatment. It calls for exploring the alternative treatments for the same. Therefore, this study aims to identify the suitable ethnomedicinal plants for scorpion bite treatment using potential phytochemicals and *in-silico* study of the interaction between various phytochemicals and active sites/binding pockets of scorpion venom proteins. Online software's for 3D-structure of protein (RCSB PDB) and ligand (PUBCHEM) in PDB and SDF format respectively. AUTODOC and PYMOL were used for preparation of ligand as well as protein and CBDOC for blind docking. The ligand (phytochemicals) exploited for docking studies were mainly accounted on the basis of ethnobotanical survey undertaken to gather information on the herbes used to treat scorpion bite cases by the local healers of Sarguja district of Chhattisgarh. Different plants species found to be used for treatment of scorpion bites includes *Andrographis paniculate* (Andrographilide), *Aegelmarmalos Linn.* (Quercetin), *Ocimum sanctum* (Rosmarinic acid), *Terminalia arjuna* (Bettulinic), respectively. Various proteins of scorpion venoms include agitoxin (*Leiurus hebraeus*), AaH111 (*Androctonus australis*), centrutoxin (*Centrunoides noxius*) and 1b7d (*Tityus obscurus*), respectively.

Keywords: Scorpion Venom, Antivenom, Phytochemicals, Molecular Docking, Active-Site

REVISITING THE ENVIRONMENTAL POLICIES IN INDIA AND UNDERSTANDING THE ROLE OF JUDICIARY IN ENSURING THE IMPLEMENTATION OF ENVIRONMENTAL JUSTICE

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Environmental issues in India have grown to be a major concern for the judiciary, civil society, and government. Rapid urbanisation and industrialization in India have contributed to a number of environmental problems, including biodiversity loss, water shortages, air pollution, and climate change. To address these issues and encourage sustainable development, the Indian government has created a number of environmental policies and legislation. In order to safeguard the environment and advance environmental justice, the judiciary has been instrumental in interpreting and upholding environmental laws, policies, and regulations. Since the Forest Conservation Act of 1980, which sought to preserve forests and wildlife, India's environmental policy has seen tremendous change. In 2006, the National Environment Policy was initially unveiled, outlining the nation's approach to environmental conservation and sustainable development. It placed emphasis on the requirement to support environmentally friendly patterns of consumption and production, protect natural resources, and include environmental factors into decision-making. The necessity of incorporating local populations in environmental decision-making was also acknowledged by the policy. The judiciary has played a crucial role in upholding the 'polluter pays' principle, holding government organisations responsible for environmental harm, and providing compensation to impacted communities. The judiciary in India has a number of difficulties in advancing environmental justice. Lack of resources and capacity is one of the major issues. Due to the complexity of environmental concerns, the lack of scientific understanding, and the lack of coordination between various regulatory organisations, the judiciary also encounters difficulties in upholding environmental laws and regulations. This paper deals with the emerging environmental issues, highlighting the importance of judiciary in ensuring that these laws are upheld and enforced for a largely complex and democratic country India, thereby safeguarding and prioritising environmental protection and conservation requires cooperation from all stakeholders, including governments, business, and the general public.

Keywords: Environmental Policies, Polluter Pays, Environmental Justice, Environmental conservation, Sustainable Development.

USE OF DIGITAL FORENSIC IN CRIME INVESTIGATION & PREVENTION (SPECIAL REFERENCE IN SURGUJA DISTRICT

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This research paper aims to explore the role of digital forensics in crime investigation & prevention in Surguja District, which is basically a remote and tribal area where even today mobile network is not available in many places, education and technology awareness is very low. With the increasing use of technology in our daily lives, criminals have also adapted to use it in their illegal activities. Digital forensics has emerged as a crucial tool in solving crimes that involve digital evidence, such as cybercrime, identity theft, and online fraud. Therefore, in areas like Surguja, such crimes happen in abundance. Digital forensics also has limited use in police investigations in such backward areas. This paper presents an overview of the digital forensic process, including the collection, analysis, and preservation of digital evidence. It discusses the various tools and techniques used in digital forensics, such as forensic imaging, network analysis, using call detail record(CDR) and data recovery. The paper also highlights the legal and ethical issues surrounding the use of digital evidence in crime investigations. Finally, the research explores the limitations and challenges of digital forensics, such as the rapid pace of technological advancements and the increasing complexity of digital devices. The findings of this research emphasize the importance of digital forensics in modern crime investigations and suggest ways to improve its effectiveness and efficiency in remote areas.

Keywords: Digital Forensic, Digital Evidence, Network Analysis

DEVELOPING AN INTRUSION DETECTION SYSTEM FOR SMART CITY IOT DEVICES USING DEEP LEARNING TECHNIQUE.

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A smart city is one in which everyday items are outfitted with sensors, software, electronics, and Internet connection so that they may share and exchange data with one another. Using smart remote administration, IoT boosts productivity and efficiency, but at the expense of increased security and privacy risks. As cyberthreats evolve, inadequate safety and privacy precautions must be taken. New security measures for the Internet of Things (IoT) devices of the smart city are required as hackers exploit new weaknesses made possible by the Internet. Reducing the number of IoT-related threads is essential for effective Intrusion Detection Systems (IDS). This allows machine learning algorithms to correctly extrapolate results from a big and complex dataset. The results of machine learning might be utilized to spot irregularities in Internet of Things networks. Using seven datasets from the ToN_IoT telemetry collection, this article implemented a deep learning model and numerous machine learning classifiers for intrusion detection. By using a voting classifier, the suggested IDS was able to obtain a 99.7 percent success rate on the Thermostat, GPS Tracker, Garage Door, and Modbus datasets.

Keywords: Internet of Things, Intrusion Detection Systems, Cyberthreats, Smart city, Deep Learning Model, Machine Learning Classifiers

IOT NETWORK SECURITY: INTRUSION DETECTION AND PREVENTION USING SOFTWARE DEFINED NETWORKING

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An enormous rise in Internet of Things (IoT) traffic has resulted from the deployment of intelligent gadgets with ubiquitous connection. Introduction of Intelligent Transportation Systems, expansion of electricity grids, and applications in human health are some of the ways that smart technologies promise to enhance human living by enhancing safety and security. Devices provide a large amount of data that is used by analytical applications in a cloud architecture. Unlike core networks, the primary goal of an attack on an IoT network is to prevent IoT data from being made accessible to applications by overwhelming devices with information requests. Due to its constrained processing capabilities, the IoT device itself cannot detect such an assault, nor can the cloud where the analytical programme operates. In addition, the conventional networking paradigm does not offer a simple method for instrumenting and controlling networking nodes, which is necessary for an efficient defence against threats. In this research, we present an Intrusion Detection Prevention System (IDPS) for internet of things (IoT) networks that is powered by software defined networking (SDN) with fog assistance. The suggested IDPS is equipped to identify different attack types in near real time and effectively neutralise threats via SDN control thanks to a collocated fog computational arrangement with IoT network. In comparison to conventional methods of intrusion detection in the Internet of Things network, we have found that our strategy is more effective.

Keywords: Intelligent Gadgets, Intelligent Transportation Systems, Threats, Intrusion Detection Prevention System, Internet of Things, Software Defined Networking, Conventional Methods

ISOLATION AND OPTIMISATION OF LACCASE PRODUCTION FROM DIFFERENT ENDOPHYTIC FUNGI AND ITS APPLICATION ON DYE DECOLORISATION

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Laccases (E. C. 1.10.3.2, p-diphenol: dioxygen oxidoreductase) are a group of multi-copper containing enzymes that catalyse the one-electron oxidation of phenolic compounds with the concomitant reduction of oxygen to water. Endophytic fungi *Aspergillus terreus* and *Aspergillus oryzae* were isolated from Aak and Ber plants in the industrial area and screened for laccase enzyme production. The amount of enzyme produced by the Endophytic fungus was estimated by performing enzyme assays and calculating enzyme activity using guaiacol as a substrate. The effect of different medium compositions (Potato dextrose broth, Czapeck dox broth) on enzyme production was also checked. Further, the effect of different parameters like Temperature, pH, and number of days of growth on the activity of the enzyme was also studied. The optimum temperature, pH, and number of days of growth determined for the enzyme were 6, 37°C and 8 days, respectively. The highest laccase enzyme produced by *Aspergillus terreus* decolorized 45.85% Bromophenol blue, 44.13% Phenol red, and *Apergillus oryzae* decolorized 36.92% bromophenol blue and 33.89% Congo red.

Key words: Laccase, Laccase production, endophytic fungi, *Aspergillus spp.*, dye decolorization

EXPLORING THE ONE STRAIN MANY COMPOUNDS APPROACH FOR ENHANCED BIOPRODUCTION: A SYNTHESIS REVIEW AND FUTURE PROSPECTS

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The one strain, many compounds approach provides guiding principles for the introduction and optimization of metabolic pathways within a single strain using genetic engineering techniques. To increase productivity, this involves adjusting metabolic fluxes and changing regulatory networks. High-throughput screening methods and synthetic biology tools have been integrated to make it easier to design and choose desired traits. Engineering strategies have been developed to increase compound diversity and yield. Analyse the effects of modifications to media composition (C/N ratio), and growth conditions (Temperature, pH, aeration, shaking, and salinity), as well as changes in growth, isolation, culture parameters, nutritional source, chemical diversity, biological (pathogens, sponge), and growth circumstances. Chemical diversity may change as a result of changes to these parameters. They can result in the induction of cluster genes (which interact with different strains) through the use of products, enzyme inhibitors, biosynthetic precursors, alternative pathways, and triggered cryptic genes. Future research should concentrate on creating cutting-edge computational tools for strain design and optimisation to address these issues. A systems-level understanding and control of the production process will be possible thanks to the integration of multi-omics approaches. The one strain, many compound approaches application to different compounds and industries will also create new opportunities for bioproduction applications. But there are obstacles and constraints that must be overcome. Multiple compounds produced by a single strain have the potential to be toxic and metabolically taxing. It can be difficult to balance the production of various compounds in order to get the best yields. Additional challenges include genetic instability and the potential loss of desired traits with extended cultivation.

Keywords: OSMAC, OSMAC Approach, Secondary Metabolites, Bioactive Natural Products.

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DEVELOPMENT OF TOPICAL NANO DRUG DELIVERY SYSTEMS FOR THE TREATMENT OF PHOTOAGING USING INDEGENIOUS HERBAL SOURCES

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Photoaging, a process where the skin undergoes changes in epidermal thickness, increases in pigment heterogeneity and dermal elastosis, degradation of collagen in the dermis, development of ectatic vessels, and increases in mutagenesis of keratinocytes and melanocytes in the skin. The skin provides natural defense against the oxidative stress caused by the UV radiations but during this process several damages occur at the tissue and cellular level of the skin. The skin provides natural defense against the oxidative stress caused by the UV radiations as the epidermis constitutes reactive oxygen species detoxifying enzymes (superoxide dismutase, catalase, thioredoxin reductase) and low molecular mass antioxidant molecules like glutathione, alpha Tocopherol and ascorbic acid. With the initiation of photo oxidative reactions several mechanisms occur like damage of biomolecules, activation of protein kinase C, depletion of antioxidant defense and induction of Ornithine decarboxylase and COX-2 activities. Photoaging can be avoided by blocking or inhibiting the UV penetration into the skin, by inhibition of inflammation by anti-oxidants and anti-inflammatory molecules and medically based rejuvenation treatments of photo aged skin. Development of novel herbal photoprotectives has remarkable advantages over the conventional formulations of plant actives. Recent advances in nano technology show their promise as potential formulation for poorly soluble, poorly absorbed and labile herbal extracts and phytochemicals.

Keywords: Photoaging, Photoprotectives, Anti-oxidants.

APPLICATIONS OF MACHINE LEARNING METHODS IN PREDICTION OF EPILEPTIC SEIZURE

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Epilepsy is a serious Neurological Condition, in which the brain of the affected individual shows some abnormal electric activity for a period. A wide range of symptoms characterize a seizure and it generally lasts for few minutes. If left untreated the epileptic seizures may become more severe in some individuals. Over the past many techniques have been used detect seizures which include detection using Electroencephalogram (EEG). Many such techniques involve machine Learning .Wearable sensors equipped with various algorithms can be used to improve the life quality of such patients .This paper is an attempt to present an brief of various applications of machine learning in Epileptic seizure detection so that an effective solution to Epileptic seizure detection problem can be achieved in future.

Keywords: Machine Learning, COVID 19,Deep Learning, Naïve Bayes, Regression.

THE ESSENCE OF BUSINESS INTELLIGENCE WITH SPECIAL ATTENTION TO BANKS

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Origin-An increase in number of channel-oriented apps, such as those that enables e-commerce and call centres, pose a new data management problem for banks that want to keep direct contact with a large number of their clients while also integrating business services in real time. Several banks are implementing business intelligence (BI) tools and systems to analyse the past and predict the future. Making the crucial business operations effective and efficient depends on the banking sector's adoption of business intelligence (BI).

Purpose- to examine how business intelligence, particularly data warehousing and data mining technologies, are affecting the performance of Indian banks and what are the different bank operations that are being impacted by the implementation and use of BI.

Findings-The report offers insight into the use of business intelligence in the Indian banking industry as well as an analysis of some of the processes used by the banks. The three BI-enabled business processes that have been experimentally tested are customer relationship management, internal process effectiveness, and fraud analysis. By employing structural equation modelling to create the measurement model, the instrument's validity and reliability were examined (SEM). The outcomes of using factor analysis and multiple regressions reveal that all three Business intelligence tool-based processes have a substantial impact on the performance of banks.

CovCTNet: A DEEP LEARNING BASED EXPERT SYSTEM FOR IDENTIFICATION OF COVID-19 USING CT SCAN IMAGES

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Corona virus disease pandemic in the year 2020 to 2021 worldwide was one of the biggest pandemic in the world history which is caused by SARS-CoV-2 virus. Identifying COVID-19 at early stage in authentic way is a critical task for the doctors. Reverse Transcription Polymerase Chain Reaction (RT-PCR) is more reliable, helpful, and quick method of classifying and evaluating COVID-19 cases and was widely used during pandemic. But this method does not tell about the severity level of disease, on the other hand chest Computed Tomography (CT) imaging based method tell much about the severity level. This research paper attempt to develop a Corona Virus Identification System using deep learning techniques with transfer learning and fine tuning as CovCTNet for identification of COVID-19 cases using chest CT image data. In order to develop the system Deep learning techniques were used. Experimental results reveals that transfer learning based VGG 19 model outperforms as compare to other Convolutional Neural Network (CNN) models with more than 99% accuracy. The models were trained through data obtained from kaggle with total of 349 samples related to COVID-19 patients and 397 samples related to normal people.

CovCTNet system provides end user to upload CT scan image data to identify it as COVID-19 positive or negative apart from this it also provide facility to upload bulk CT image data for identification of COVID-19 cases.

Keywords: CoVCTNet: Corona virus identification system using deep learning through CT scan omage, Deep learning, Convolutional Neural Network (CNN), Transfer Learning, COVID-19

MEMANTINE AND THEIR COMBINATION FOR THE TREATMENT OF MODERATE TO SEVERE FORMS OF ALZHEIMER'S DISEASE

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Alzheimer's disease is a neurodegenerative brain condition associated with aging that is progressive, incurable, and irreversible. The burden of Alzheimer's disease is expected to grow with the aging population, and it is estimated that 115 million people globally will be living with dementia by 2050. Memantine is an amino-alkyl cyclohexane derivative that was initially synthesized and patented in 1968. It has been demonstrated to have high tolerance over 15 years in more than 200,000 individuals. Memantine is a non-competitive NMDA receptor antagonist used in therapeutic settings for a number of CNS illnesses, including Alzheimer's disease. Various drug combinations of Memantine, such as Memantine with Donepezil, Memantine with Galantamine, and Memantine with Nitroglycerin, have shown superior results than memantine alone in terms of improving dendritic and synaptic density. The current article elucidates the pathophysiology of Alzheimer's disease and the role of the NMDA receptor, as well as recent breakthroughs in memantine monotherapy and combination therapy, and its mechanism of action.

Keywords: Alzheimer's disease, NMDA receptor, Memantine, Monotherapy therapy, Combination therapy.

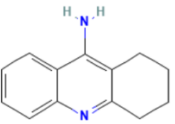
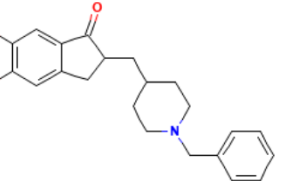
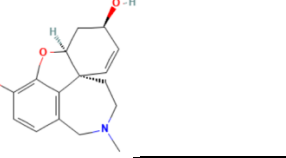
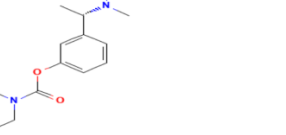
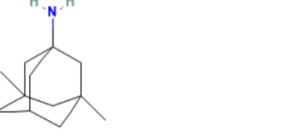
1. INTRODUCTION

Alzheimer's disease (AD) is an aging-related neurodegenerative brain disease that is progressive, irreversible and incurable. AD is the most frequent type of dementia among the world's elderly (Lane, Hardy, & Schott, 2018; Yao, Yang, & Yang, 2022). The AD accounts for 60% of all dementia cases. AD is more common and affects more people as they get older. The women typically live longer than men do, the disease affects them at a higher rate. Alzheimer's disease affects roughly 1% of adults between the ages of 65 and 70 and about 4% of those over the age of 85 (Imbimbo, Lombard, & Pomara, 2005). Alzheimer's disease is the third biggest cause of death in developed countries, after cardiovascular disease and cancer (Huang et al., 2016). The impact of AD is likely to rise with the ageing population, with an estimated 115 million individuals worldwide living with dementia by 2050. The most practical treatment goal for AD is to prevent the symptoms from getting worse because there is presently no known cure (Rive, Gauthier, Costello, Marre, & François, 2013). The main signs of AD included accelerated memory loss that makes daily tasks complicated,

difficulties with making plans or problem-solving, difficulty completing regular household tasks, confusion about the passing of time or the place of an incident, difficulty understanding visual imagery and spatial interactions, new word-related difficulties when speech or writing, and difficulty losing things and being unable to go back a step. The additional signs and symptoms of AD include diminished or poor judgement, indifference and sadness, shifts in mood and attitude, anxiety, agitation, and sleep difficulties, all of which are on the rise (Lane et al., 2018; Yao et al., 2022). They even include disengagement from work or social interactions activities, which is a common sign of depression (Hu, Tan, Tan, & Yu, 2017).

The scientific world has worked extremely hard to develop cures for the deadly disease of AD, but these trials are currently failing. FDA-approved medications for treating AD include Tacrine, Donepezil, Galantamine, and Rivastigmine, which target and inhibit acetylcholinesterase (AChEIs), and Memantine, an antagonist of the N-methyl-D-aspartate (NMDA) receptor's activity (Table 1) (Guzior, Wieckowska, Panek, & Malawska, 2015; Olivares et al., 2012). However, despite the fact that these commercially available medications can decrease symptoms and limit the spread of the illness, they ultimately fall short of curing it. The current review elucidates the pathophysiology of AD and the role of the NMDA receptor, as well as recent breakthroughs in memantine monotherapy and combination therapy, as well as the mechanism of action.

Table 1: Clinically approved drugs for the treatment of Alzheimer's disease.

Name	Chemical Structure	Approval Year
Tacrine		1993
Donepezil		1996
Galantamine		2001
Rivastigmine		2000
Memantine		2003

2. PATHOPHYSIOLOGY OF AD AND ROLE OF NMDA RECEPTOR

The pathophysiology of AD includes both structural and functional abnormalities [8]. It is a progressive neurodegenerative condition characterized morphologically by brain atrophy and

increased cerebral ventricles (Imbimbo et al., 2005) by the deposition of β -amyloid protein in the form of extracellular senile (amyloid) plaques and the formation of intracellular neurofibrillary tangles in the medial temporal lobe, entorhinal cortex, and hippocampus (Querfurth & LaFerla, 2010). The plaques are composed of the insoluble amyloid protein that originates from the amyloidogenic processing of a much larger metalloprotein amyloid precursor protein (APP) and neurofibrillary (tau) tangles. The inflammatory changes with astrogliosis and microgliosis, oxidative stress and neuropil threads that have been found in the post-mortem AD brain, and in addition, a variety of other neurochemical and cellular alterations that result in anatomic as well as functional impairment of the neurotransmitter systems (Kure, Tominaga, Yoshimoto, Tada, & Narisawa, 1991; S. A. Lipton, 2004; Schmitt, Ryan, & Cooper, 2007).

The N-methyl-D-aspartate receptor (NMDAR) is essential for synaptic transmission and synaptic plasticity, which are thought to underpin learning and memory, and also essential for nervous system development and function, as well as neurotoxicity. NMDARs have been linked to neuronal injury in a variety of neurological disorders such as ischemia, brain trauma, epilepsy, dementia, and neurodegenerative disorders (Kemp & McKernan, 2002; Liu, Chang, Song, Li, & Wu, 2019). NMDAR is a glutamate ligand, and glutamate is the primary excitatory neurotransmitter in the human brain. Most NMDAR subtypes are distinct in that they require both presynaptic glutamate release and strong postsynaptic membrane depolarization to relieve Mg^{2+} channel block (Mayer, Westbrook, & Guthrie, 1984; Nowak, Bregestovski, Ascher, Herbet, & Prochiantz, 1984). NMDARs activation increase Ca^{2+} , Na^{+} , and K^{+} permeability and act as a second messenger to modify synapses. NMDARs are critical mediators of brain plasticity because they can convert specific patterns of neuronal activity into long-term changes in synapse structure and function, which are thought to underpin higher cognitive functions (Traynelis et al., 2010). NMDAR activation increases cytosolic free intracellular calcium, which is required for long-term potentiation (LTP) and long-term depression (LTD) (as well as synaptic plasticity more broadly (MacDermott, Mayer, Westbrook, Smith, & Barker, 1986; Olivares et al., 2012). Over-activation of the receptor results in an excessive amount of Ca^{2+} influx into a neuron, which then triggers a number of processes that can result in death.

3. MEMANTINE FOR AD TREATMENT

Memantine was first synthesised and patented in 1968 by Eli Lilly and Company (Indianapolis, IN), as chemically consisting of (1-amino-3,5-dimethyladamantane), an amino-alkyl cyclohexane derivative adamantine, an anti-influenza agent (Olivares et al., 2012). It has a three-ring (adamantane) structure with a bridgehead amine ($-NH_2$) that carries a positive charge and binds at or near the Mg^{2+} site within the NMDAR-associated channel under physiological conditions. Memantine is a non-competitive antagonist at NMDA receptors used in clinical practice for a variety of CNS disorders other than AD, and has been shown to have good tolerability over 15 years in > 200,000 patients (Liu et al., 2019; Olivares et al., 2012). Memantine was relatively ineffective at blocking the low levels of receptor activity associated with normal neurological function but becomes increasingly effective at higher concentrations of glutamate associated with over-activation of NMDARs (Chen & Lipton, 2006). During normal synaptic activity, NMDA channels are open on average for only several milliseconds, and memantine is unable to act or accumulate within the channels; accordingly, synaptic activity continues largely unabated (S. A. Lipton, 2004). During prolonged activation of the receptor, however, as occurs under excitotoxic conditions, memantine becomes a highly effective blocker.

Memantine has been shown to be clinically effective in treating the symptoms of moderate to severe AD and has been linked to a mild reduction in clinical deterioration in AD. Its effectiveness has been demonstrated in several scientific reports and clinical trials, where it demonstrated small but statistically significant improvements (Agüera-Ortiz, 2010; Grossberg, Pejović, Miller, & Graham, 2009), as measured by brain imaging. Several systematic reviews of randomized controlled trials

have found that memantine has small but beneficial effects on cognition, mood, behaviour, and the ability to perform daily activities in people with moderate to severe Alzheimer's disease (Areosa, Sherriff, & McShane, 2005; Emre, Mecocci, & Stender, 2008; Wilcock, Ballard, Cooper, & Loft, 2008). Importantly, memantine does not exhibit the side effects typically connected with drugs like this one and appears capable of achieving its pharmacological effects in a clinically well-tolerated manner. The most common memantine-induced adverse effects reported in trials were dizziness, occasional restlessness/agitation, constipation, ocular effects (cataracts, conjunctivitis), nausea, dyspnea, confusion, headache, fatigue, rash, diarrhoea, and urinary incontinence (Farlow, Graham, & Alva, 2008; Rossom, Adityanjee, & Dysken, 2004). Based on the results of successful clinical trials, the use of memantine in the modulation of glutamatergic function may be a useful strategy for the treatment of Alzheimer's disease. Furthermore, in vitro and clinical data show no negative interactions between memantine and approved cholinesterase inhibitors (Periclou, Ventura, Sherman, Rao, & Abramowitz, 2004; Wenk, Quack, Moebius, & Danysz, 2000).

4. MEMANTINE COMBINATION THERAPY

Memantine and Donepezil Fixed Dosage is an orally accessible, non-competitive NMDA receptor antagonist and AChE reversible antagonist in one capsule that is now in Phase IV development for the treatment of moderate to severe AD (Calhoun, King, Khoury, & Grossberg, 2018). Donepezil is a highly effective, reversible acetylcholinesterase, but not a butyrylcholinesterase, antagonist (A. V. Terry & Buccafusco, 2003; Shigeta & Homma, 2001). Memantine in combination with donepezil had superior benefits on cognitive and general function, as well as behavioural and psychological symptoms, than donepezil alone. The acceptance was somewhat greater than that of donepezil and slightly lower than that of memantine.

The pharmacological combination of Memantine and Galantamine revealed a mutual malfunction in the cholinergic and glutamatergic systems' activity in Alzheimer's pathology (Korabecny et al., 2019). Thus, the current therapy option for people with AD may involve targeting both glutamatergic and cholinergic neurons (Patel & Grossberg, 2011). Glutamate and glycine agonists interact with NMDARs to activate their memory and learning functions (Kabir et al., 2020). Through excessive glutamatergic activity, the NMDAR receptor may be overexcited, which can lead to an unregulated Ca^{2+} influx into the neurons and excitotoxicity. Galantamine, on the other hand, inhibits glutamate toxicity by activating nicotinic ACh receptors, revealing a neuroprotective effect. AChE is also inhibited by galantamine (Posadas, López-Hernández, & Ceña, 2013). Galantamine and memantine working together in the same excitotoxic cascade may therefore have a synergistic neuroprotective effect (Takada-Takatori et al., 2006). The construction of a novel series of hybrid compounds with potential pharmacological effects of both galantamine and memantine was defined by the aforementioned combination technique (Simoni et al., 2012). In their investigation, Lopes et al. showed that galantamine protects primary cortical neurons from NMDA-induced neurotoxicity. This data provided support for the approach. They added that galantamine had a stronger neuroprotective effect at low dosages (Lopes, Taroazzo, Reggiani, Piomelli, & Cavalli, 2013).

The Memantine and Nitroglycerin combination was created by attaching nitroglycerin's key nitrooxy, -ONO₂ pharmacophore component to memantine (Stuart A. Lipton et al., 1993). The activity of these analogues was tested in vivo on extrasynaptic NMDARs in a triple transgenic AD mouse model. In triple transgenic AD mice that were 9 months old, nitromemantine showed superior results than memantine alone in terms of improving dendritic and synaptic density. In addition, the investigations in AD mouse models demonstrated the beneficial effects of nitromemantine in reversing the loss of brain networks and returning the number of synapses to normal after a few months of treatment (Dodel et al., 2013; Serrano-Pozo et al., 2010). Nitromemantine has good disease-modifying characteristics but has no adverse effects on blood pressure. In the approaching years, Nitromemantine appears to have promise as a treatment for both early and late stages of AD due to all the positive effects it has shown in clinical investigations (Kabir et al., 2020).

5. MODE OF ACTION OF MEMANTINE

The features, make NMDA receptors ideally suitable for treatment of AD. When a high frequency signal arrives at the glutamatergic synapse leading to a massive glutamate release. Glutamate binds to NMDA. The glutamates are principally voltage sensitive NMDA type receptor, when they are activated, allows entry of Ca^{2+} into the neuron. Activation typically occurs only after depolarization by other ionotropic glutamate receptors (AMPA and kainate). At rest, the NMDA receptor channel is blocked by a magnesium ion (Liu et al., 2019; Olivares et al., 2012), resting membrane potential is about -70 mV, the Ca^{2+} channel of NMDAR is blocked by Mg^{2+} (S. A. Lipton, 2004; Posadas et al., 2013). The NMDARs on membrane can be roughly divided into two population groups: synaptic and extrasynaptic. Recent studies show that extrasynaptic NMDARs may be responsible for glutamate excitotoxicity and cell death (Liu et al., 2019).

Memantine is a noncompetitive antagonist of the NMDA-type glutamate receptor where as memantine has no activity at AMPA/kainate receptors (Liu et al., 2019). It operates by decreasing excessive glutamatergic NMDA receptor stimulation while maintaining normal receptor activation and neuronal transmission (S. A. Lipton, 2004; Posadas et al., 2013). Memantine is clinically well tolerated and may exhibit unusual neuroprotective characteristics due to its unique method of action. Memantine is recommended for Alzheimer's disease that is moderate to severe. Inhibiting Ca^{2+} entry into the cell through the NMDA receptor during partial neuronal depolarization while permitting entry during full depolarization, it binds at or close to the magnesium-binding site (Fig. 1) (Kemp & McKernan, 2002; Liu et al., 2019).

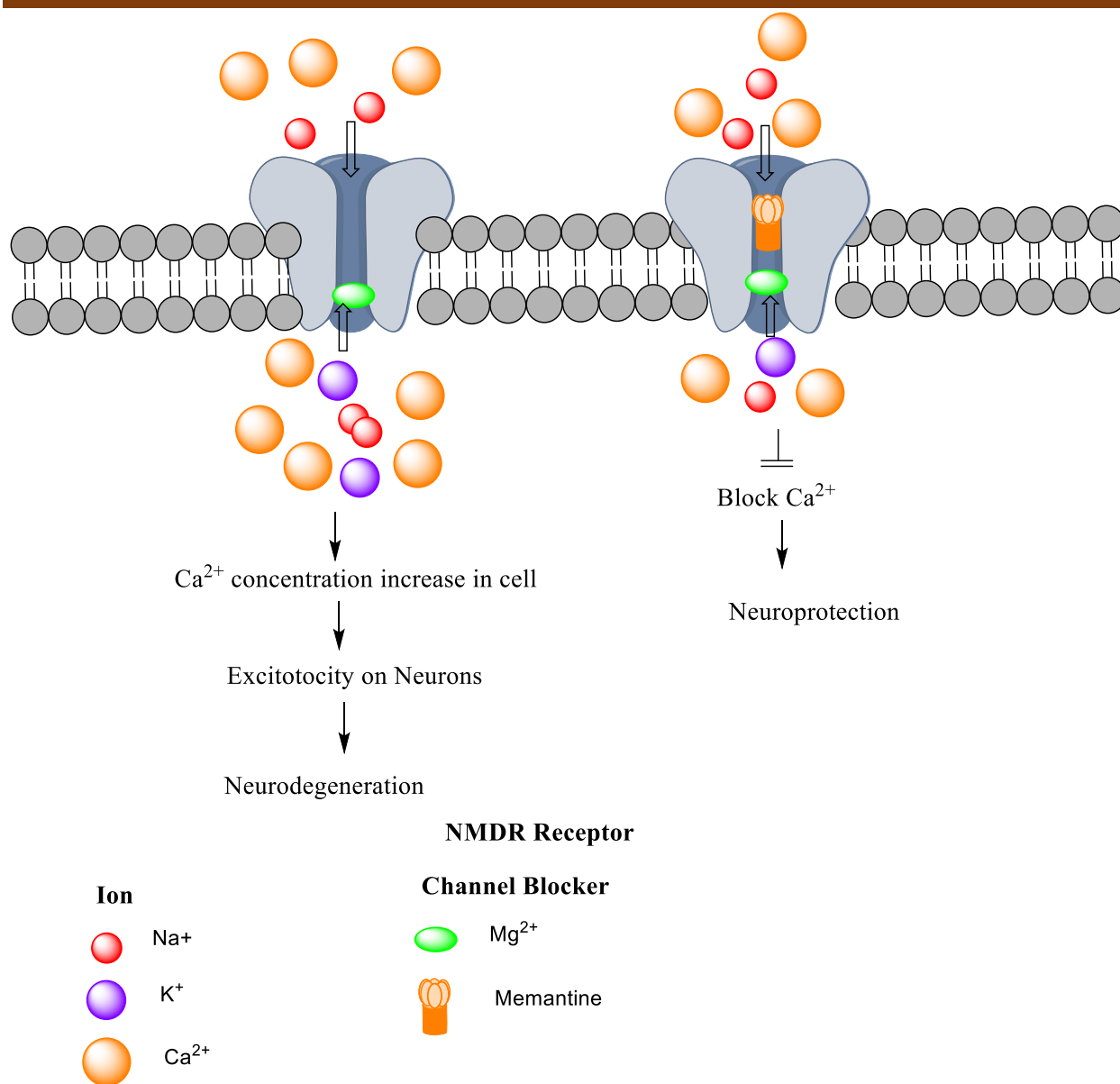


Figure 1: Mechanism of action of Memantine in the treatment of Alzheimer's disease.

6. CONCLUSION

The N-methyl-D-aspartate receptor (NMDAR) is crucial for neuronal growth and function as well as neurotoxicity. It is also crucial for synaptic transmission and synaptic plasticity, which are thought to underlie learning and memory. Memantine is an amino-alkyl cyclohexane derivative that was initially synthesised and patented in 1968. It has been demonstrated to have high tolerance over 15 years in more than 200,000 individuals. Memantine is a non-competitive NMDA receptor antagonist used in therapeutic settings for a number of CNS illnesses outside AD. Memantine appears to be able to achieve its pharmacological effects in a clinically well-tolerated manner and does not show the adverse effects commonly associated with medications of this type. The various drugs combination such as Memantine and Donepezil, Memantine and Galantamine, Memantine and Nitroglycerin showed superior results than memantine alone in terms of improving dendritic and synaptic density.

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A GREEN INTEGRATED INVENTORY MODEL WITH PARTIAL TRADE CREDIT POLICY CONSIDERING EXPIRATION OF PRODUCT

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For any manufacturing house, reliability is one of the major factors which control the demand in the market. An organization adopts various business strategies to the customer like partial credit facility or discount which attracts the customers and increases total profit of the organization. The life time of deteriorating items is finite. So we have considered a model for such situation with an expiration date. Carbon emission is the result of transportation, logistic and holding inventory etc. due to carbon omitting. We consider all practicable cases for manufacturer credit period as well as customer's credit period considering carbon emission. The convexity of each objective function is explored simultaneously with graphical representation. Further sensitivity analysis is executed to validate the model with variation in important parameters.

Keywords: reliability, partial credit facility, expiry date, business strategy, deterioration, carbon emission

1. INTRODUCTION

In inventory management, it is always presumed that demand is certain but in the environment of competitive world, an organization has to deal with many external factors which influence the demand such as price, stock and time etc. On the other hand firm has to manufacture more reliable product with optimum cost and time. A firm has to take care of many dimensions to attract the customers like buying good raw materials, using human resources effectively and more and more reduction of defective items & total cost etc. (Ghare, Schrader, 1963) has proposed a model for exponential deterioration items. Extensively, it is considered that the retailer has to pay the whole amount for purchasing the items. For putting more sales of items manufacturer offered many different schemes or policies to the customers to take more revenue from the market. There are several policies like credit policy/ trade credit policy/partial credit policy provided in the inventory

management. Under these policies a retailer need not to pay full amount at one go. Manufacturer permits the time duration to pay the amount under certain agreements with equivalent price. When the manufacturer provides the time duration to pay with equivalent price then, it is known as Single period credit policy approach and when the retailer offered credit policies to customer then it is known as two level trade credit policies. The first EOQ model was introduced by (Goyal, 1985) where the supplier permits a delay in payments to certain period of time. In the context of this model (Aggarwal and Jaggi, 1995), the work is extended with the parameters of deterioration. In this aspects many researchers (Petersen and Rajan, 1997; Seifert et al., 2013; Soni et al., 2010) have done the review for trade credit policies. In trade credit policy the manufacturer offered the retailer to pay full amount at the end of the credit period but in the partial level a retailer can pay the amount in proportions and can give the amount at the end of the credit period. (Vandana et al., 2021) has considered the carbon emission cost in ordering cost and holding cost for two level trade credit policy where demand is a function of the credit period and selling price. (Molamohamadi and Mirzazadeh, 2021) formulated an EOQ model for deteriorating items and concluded that increasing the duration of credit period effects the total cost of the retailer. Evidently, deterioration is a common phenomenon. Deterioration items have a limited life time such as vegetables and fruits. Such items decayed or expired over time. Some researchers have been conducted with expiration date or maximum life time and extended the model (Wu et al., 2014) proposed a model considering the expiry date and then the model is extended by (Tiwari et al., 2018) for a supply chain for determining the optimum price and replenishment cycle. As the expiry date approaches the deterioration rate of a product gradually increases (Teng et al., 2016). The former model is extended by (Mashud et al., 2021) for deteriorating item by considering realistic holding cost and discount for multiple prepayment. Manufacturing organizations always try to check the reliability of the product. (Urban, 1992) incorporated reliability in his inventory model. In the same line many other researchers (Das et al., 2021; Pal et al., 2007; Sarkar et al., 2014) introduced an inventory model considering the reliability with trade credit policy.

Manufactures always try to adopt various strategies to attract more customers or retailers. Retailers do not have to pay the full amount to the manufacturer. Retailers are offered trade credit policy or discount on the amount; they have to pay to manufacturers. Manufacturer always want to check the quality of the product to compete in the market as well as for good will. So reliability incorporation in trade credit policy optimizes the total cost. Deterioration is also major concern in the inventory model. In the present study a model is considered with partial trade credit policy with reliability incorporation and deterioration of the items are considered for those items which have a maximum life time or expiry date. Seven cases are considered with trade credit policy for both manufacturer

and customers and then solved mathematically. Also the graph for convexity is implemented for each case and further the relation between reliability and total cost & expiration duration and total cost is explained through graphical depiction. To validate the model sensitivity is performed for expression 1 in the variation of some important parameters.

2. PRESUMPTIONS AND ANNOTATIONS

Presumptions

1. The manufacturer manufactures the product with the reliability.
2. Demand is a linear price sensitive.
3. The customer's demand increases/decreases when the price of items decreases/increases.
4. The deterioration rate of the items is time dependent. All the deterioration items diminish over time with expiry date m . Using the same assumptions of (Chen and Teng, 2014; Teng et al., 2016; Wang et al., 2014), one has $\theta(t) = \frac{1}{1+m-t}$, $0 \leq t \leq T \leq m$
5. Value of deterioration lie between 0 and 1 which satisfies $\theta'(t) < 0$ and $\theta(m) = 1$.
6. Lead time is constant.
7. No shortages are allowed.
8. The planning horizon of the system is finite.
9. The manufacturer allows a partial trade credit to his customers.
10. Carbon emission cost is considered.

Annotations

C_o	Ordering cost
S	Selling price
Θ	Deterioration rate
R	Reliability rate to produced good items
P	Production rate
a, b	Demand constants
M	Manufacturer's trade credit period provided by the supplier
N	Customer's trade credit period provided by the manufacturer
M	Expiration time
h_c	Holding cost per unit per unit time

Σ	Customer need to pay σ portion of the purchase price to the manufacturer when he/she have placed the order
I_e	Interest earned by the manufacturer
C	Regular production cost
K	Deterioration cost
I_c	Interest payable by the manufacturer
t_1	Production stopping time
TC	Total cost of the system
T	Cycle length
c_c	Carbon emission cost per unit per unit time

3. MATHEMATICAL MODEL FORMULATION

In the present study, the manufacturing organization is willing to produce non defective items. At the beginning, the inventory is zero at the time $t=0$, with production rate P per unit time. After meeting retailer's demand, the extra amount is stored. At the time t_1 , the manufacturing organization takes a decision to finished the produced and fulfils the retailer's demand from the produced products up to time $t=T$. The deterioration is considered with expiry duration m .

The governing equations are

$$\frac{dI(t)}{dt} + \theta(t)I(t) = -(a - bs) + rp \quad 0 < t < t_1 \quad (1)$$

$$\frac{dI(t)}{dt} + \theta(t)I(t) = -(a - bs) \quad t_1 < t < T \quad (2)$$

With boundary conditions $I(0)=0$

$$\theta(t) = \frac{I}{I + m - t}$$

On solving equation 1 & 2

We have,

$$I(t) = (rp - a + bs)(I + m - t) \log \left(\frac{I-m}{I+m-t} \right) \quad 0 < t < t_1 \quad (3)$$

$$I(t) = (bs - a)(I + m - t) \log \left(\frac{I+m-T}{I+m-t} \right) \quad t_1 < t < T \quad (4)$$

Inventory related costs are as follows-

a) Annual Ordering Cost per Cycle

$$O_e = \frac{C_o}{T} \quad (5)$$

b) Annual holding Cost per Cycle

$$H = \frac{h}{T} \left(\int_0^{t_l} I(t) dt + \int_{t_l}^T I(t) dt \right)$$

i.e

$$\begin{aligned} H = & \frac{h}{T} \left[(rp - a + bs) \log(I + m) \left\{ (I + m)t_l - \frac{t_l^2}{2} \right\} + (rp - a + bs) \left(\frac{(I+m-t_l)^2}{2} \right) \left\{ \log(I + m - t_l) - \right. \right. \\ & \left. \left. \frac{I}{2} \right\} - \frac{(I+m)^2}{2} \left\{ \log(I + m) - \frac{I}{2} \right\} + \log(I + m - T) \left\{ (I + m)(T - t_l) - \frac{T^2}{2} + \frac{t_l^2}{2} \right\} + \frac{(I+m-T)^2}{2} \left\{ \frac{I}{2} - \right. \right. \\ & \left. \left. \log(I + m - T) \right\} - \frac{(I+m-t_l)^2}{2} \left\{ \frac{I}{2} - \log(I + m - t_l) \right\} \right] \end{aligned} \quad (6)$$

c) Annual deterioration Cost:

$$D_c = \frac{c_d}{T} \left(\int_0^{t_l} \frac{I}{I + m - t} I(t) dt + \int_{t_l}^T \frac{I}{I + m - t} I(t) dt \right)$$

i.e

$$\begin{aligned} D_c = & \frac{c_d}{T} \left[(rp - a + bs)(\log(I + m) t_l - I) - (rp - a + bs)\{(I + m - t_l)\{\log(I + m - t_l) + I\} - \right. \\ & (I + m) \log\{(I + m) + I\} + (bs - a)\{\log(I + m - T)(T - t_l) + (I + m - t_l)(\log(I + m - t_l) + \\ & \left. I) - (I + m) \log(I + m) + I\} \right] \end{aligned} \quad (7)$$

d) Annual Carbon emission Cost:

$$C_c = \frac{c_c}{T} \left(\int_0^{t_l} \frac{I}{I + m - t} I(t) dt + \int_{t_l}^T \frac{I}{I + m - t} I(t) dt \right)$$

i.e

$$\begin{aligned} C_c = & \frac{c_c}{T} \left[(rp - a + bs)(\log(I + m) t_l - I) - (rp - a + bs)\{(I + m - t_l)\{\log(I + m - t_l) + I\} - \right. \\ & (I + m) \log\{(I + m) + I\} + (bs - a)\{\log(I + m - T)(T - t_l) + (I + m - t_l)(\log(I + m - t_l) + \\ & \left. I) - (I + m) \log(I + m) + I\} \right] \end{aligned} \quad (8)$$

4. MATHEMATICAL MODEL

As per the contemplated credit period duration, two unique frameworks may be emerged.

State 1: $N < M$

State 2: $M < N$

Now,

State 1: $N < M$

In this situation, Customer's credit period (N) from the manufacturers is less than the manufacturer's credit period (M) from the supplier. According to this circumstance, there are four cases may occur

Expression 1: $M \leq t_1$

Expression 2: $t_1 < M \leq T$

Expression 3: $N < T \leq M$

Expression 4: $T < N \leq M$

Now,

Expression 1: $M \leq t_1$

In Expression 1, interest payable and interest earn by the manufacturer can be calculated as follows

Amount of Interest Paid

$$\begin{aligned} \text{AIP} &= \frac{CI_c}{T} \left[\int_M^{t_1} I(t) dt + \int_{t_1}^T I(t) dt \right] \\ \text{AIP} &= \frac{CI_c}{T} \left[(bs - a) \{ \log(l + m - T) \left((l + m)(T - t_1) - \frac{T^2}{2} + \frac{t_1^2}{2} \right) + \frac{(l + m - T)^2}{2} \left(\frac{l}{2} - \log(l + m - T) \right) - \frac{(l + m - t_1)^2}{2} \left(\frac{l}{2} - \log(l + m - t_1) \right) \} \right. \\ &\quad \left. + (rp - a + bs) \{ \log(l - m) \left((l + m)(t_1 - M) - \frac{(T - M)^2}{2} \right) + \frac{(l + m - t_1)^2}{2} \left(\log(l + m - t_1) - \frac{l}{2} \right) - \frac{(l + m - M)^2}{2} \left(\log(l + m - M) - \frac{l}{2} \right) \} \right] \end{aligned}$$

(6.9)

$$\text{Interest obtain} = \frac{[sI_o D \sigma \int_0^N t dt + sI_o D \int_N^M t dt]}{T}$$

$$\text{i.e., IO} = \frac{sI_o D [M^2 - (l - \sigma)N^2]}{2T} \quad (10)$$

Therefore, the average cost for the manufacturer is given by $TC_I(T) = Y_I$.

Y_I = ordering cost+ holding cost+ deterioration cost + carbon emission cost+ interest paid+ interest obtain

$$Y_I = O_e + h_c + D_c + C_c \text{ AIP} + \text{IO} \quad (11)$$

Expression 2: $t_1 < M \leq T$

In Expression 2, interest payable and interest earn by the manufacturer can be calculated as follows

Amount of Interest Paid

$$\text{AIP} = \frac{CI_c}{T} \left[\int_M^T I(t) dt \right]$$

$$= \frac{CI_c}{T} [(bs - a) \{ \log(I + m - T) \left((T - M)(I + m) - \frac{(T - M)^2}{2} \right) + \frac{(I + m - T)^2}{2} \left(\log(I + m - T) - \frac{I}{2} \right) - \frac{(I + m - M)^2}{2} \left(\log(I + m - M) - \frac{I}{2} \right) \}] \quad (12)$$

$$\text{Interest obtain} = \frac{[sI_o D \sigma \int_0^N t dt + sI_o D \int_N^M t dt]}{T}$$

$$\text{i.e., IO} = \frac{sI_o D [M^2 - (I - \sigma)N^2]}{2T} \quad (13)$$

Therefore, the average cost for the manufacturer is given by $TC_2(T) = Y_2$.

Y_2 = ordering cost+ holding cost+ deterioration cost+ carbon emission cost+ interest paid+ interest obtain

$$Y_2 = O_e + h_c + D_c + C_c + AIP + IO \quad (14)$$

Expression 3: $N < T \leq M$

In Expression 3, the interest payable will be zero for the manufacturer as permissible delay time (M) is less than cycle length (T). Therefore, the manufacturer needs not to pay any interest.

$$\text{i.e., } AIP = 0 \quad (15)$$

$$\text{Interest obtain} = \frac{[sI_o D \sigma \int_0^N t dt + sI_o D \int_N^T t dt + DT \int_T^M dt]}{T}$$

$$\text{i.e., IO} = \frac{sI_o D [2MT - (I - \sigma)N^2 - T^2]}{T} \quad (16)$$

Therefore, the average cost for the manufacturer is given by $TC_3(T) = Y_3$.

Y_3 = ordering cost+ holding cost+ deterioration cost+ carbon emission cost+ interest paid- interest obtain

$$Y_3 = O_e + h_c + D_c + C_c + AIP + IO \quad (17)$$

Expression 4: $T \leq N < M$.

In Expression 4, the interest payable will be zero for the manufacturer as cycle length (T) is not only less than cycle length (T) is less than customer's credit period (N) but also the manufacturer permits the delay in settlement (M). Therefore, the manufacturer needs not to pay any interest.

$$\text{i.e., } AIP = 0 \quad (18)$$

$$\text{Interest obtain} = \frac{sI_o D [\sigma \int_0^T t dt + \sigma T \int_T^N dt + T \int_N^M dt]}{T}$$

$$\text{i.e., IO} = sI_o D [M - (I - \sigma)N - \frac{\sigma T}{2}] \quad (19)$$

Therefore, the average cost for the manufacturer is given by $TC_4(T) = Y_4$.

Y_4 = ordering cost+ holding cost+ deterioration cost+ carbon emission cost+ interest paid- interest obtain

$$Y_4 = O_e + h_c + D_c + C_c + AIP + IO \quad (20)$$

State 2: $M < N$

For this state, customer's credit period (N) from the manufacturer is less than the manufacture's credit period (M) from his supplier. Here, three cases may be arisen.

Expression 5: $M < N \leq t_1$

Expression 6: $t_1 < M < N \leq T$

Expression 7: $T \leq M < N$

Now,

Expression 5: $M < N \leq t_1$

In Expression 5, interest payable and interest earn by the manufacture can be calculated as follows

Amount of Interest Paid

$$\begin{aligned} \text{AIP} &= \frac{CI_c}{T} \left[\int_{t_1}^T I(t) dt + \int_M^{t_1} I(t) dt \right] \\ &= \frac{CI_c}{T} \left[(bs - a) \{ \log(I + m - T) \left((I + m)(T - t_1) - \frac{(T - t_1)^2}{2} \right) + \frac{(I + m - T)^2}{2} \left(\log(I + m - T) - \frac{I}{2} \right) - \right. \\ &\quad \left. \frac{(I + m - t_1)^2}{2} \left(\log(I + m - t_1) - \frac{I}{2} \right) \} + (rp - a + bs) \{ \log(I - m) \left((t_1 - M)(I + m) - \frac{(t_1 - M)^2}{2} \right) + \right. \\ &\quad \left. \frac{(I + m - t_1)^2}{2} \left(\log(I + m - t_1) - \frac{I}{2} \right) - \frac{(I + m - M)^2}{2} \left(\log(I + m - M) - \frac{I}{2} \right) \} \right] \end{aligned} \quad (21)$$

$$\text{Interest obtain} = \frac{sl_o D \sigma \int_0^M t dt}{T}$$

$$\text{i.e., IO} = \frac{sl_o D \sigma M^2}{2T} \quad (22)$$

Therefore, the average cost for the manufacturer is given by $TC_5(T) = Y_5$.

Y_5 = ordering cost+ holding cost+ deterioration cost+ carbon emission cost+ interest paid- interest obtain

$$Y_5 O_e + h_c + D_c + C_c + \text{AIP} + \text{IO} \quad (23)$$

Expression 6: $t_1 < M < N \leq T$

In Expression 6, interest payable and interest earn by the manufacture can be calculated as follows

Amount of Interest Paid

$$\text{AIP} = \frac{CI_c}{T} \left[\int_M^T I(t) dt \right]$$

$$\text{AIP} = \frac{CI_c}{T} [(bs - a) \left\{ \log(l + m - T) \left((l + m)(T - M) - \frac{(T-M)^2}{2} \right) + \frac{(l+m-T)^2}{2} \left(\log(l + m - T) - \frac{l}{2} \right) + \frac{(l+m-M)^2}{2} \left(\log(l + m - M) - \frac{l}{2} \right) \right\}] \quad (24)$$

$$\text{Interest obtain} = \frac{sI_o D \sigma \int_0^M t dt}{T}$$

$$\text{i.e., IO} = \frac{sI_o D \sigma M^2}{2T} \quad (25)$$

Therefore, the average cost for the manufacturer is given by $TC_6(T) = Y_6$.

Y_6 = ordering cost+ holding cost+ deterioration cost+ carbon emission cost+ interest paid- interest obtain

$$Y_6 = O_e + h_c + D_c + C_c + \text{AIP} + \text{IO} \quad (26)$$

Expression 7: $T \leq M < N$

In Expression 7, the manufacturer's credit period (M) is less than cycle length (T). So, there would be no interest paid.

Amount of Interest Paid will be zero.

$$\text{AIP} = 0 \quad (27)$$

Therefore, under partial trade credit policy, the manufacturer can obtain revenue from the customer.

$$\text{Interest obtain} = \frac{sI_o D \sigma \int_0^T t dt + sI_o D T \int_T^M dt}{T}$$

$$\text{i.e., IO} = sI_o D \sigma \left[M - \frac{T}{2} \right] \quad (28)$$

Therefore, the average cost for the manufacturer is given by $TC_7(T) = Y_7$.

Y_7 = ordering cost+ holding cost+ deterioration cost+ carbon emission cost+ interest paid- interest obtain

$$Y_7 = O_e + h_c + D_c + C_c + \text{AIP} + \text{IO} \quad (29)$$

5. Numerical Exemplification

Example 1- To solve expression 1, we have used the following data.

$$c_o = 1000, s = 73, \theta =, r = 0.95, p = 1700, a = 11.55, b = 5.5, M = 0.15, N = 0.12, m = 4.5, h_c = 13.5, \sigma = .001, I_e = 0.01, c = 156, k = 506, I_c = 0.2, c_c = 0.2$$

Example 2- To solve expression 1, we have used the following data.

$$c_o = 1000, s = 80, \theta =, r = 0.55, p = 2200, a = 1000, b = 5, M = 0.2, N = 0.164, m = 4.5, h_c = 4.5, \sigma = .001, I_e = 0.01, c = 400, k = 506, I_c = 0.12, c_c = 0.2$$

Example 3- To solve expression 1, we have used the following data.

$$c_o = 500, s = 98.9, \theta =, r = 0.95, p = 1700, a = 10.5, b = 4.89, M = 1.55, N = 0.164, m = 4.5, h_c = 10.9, \sigma = .007, I_e = 0.01, c = 156, k = 511, I_c = 0.13, c_c = 0.2$$

Example 4- To solve expression 1, we have used the following data.

$$c_o = 500, s = 77, \theta =, r = 0.91, p = 1650, a = 14.55, b = 4.1, M = 0.9, N = 1.78, m = 2.1, h_c = 14.5, \sigma = .002, I_e = 0.07, c = 156, k = 550, I_c = 0.2, c_c = 0.2$$

Example 5- To solve expression 1, we have used the following data.

$$c_o = 1000, s = 45, \theta =, r = 0.92, p = 16735, a = 13.55, b = 4.1, M = 0.2, N = 0.2, m = 3, h_c = 13.5, \sigma = .001, I_e = 0.01, c = 155, k = 506, I_c = 0.12, c_c = 0.2$$

Example 6- To solve expression 1, we have used the following data.

$$c_o = 1000, s = 45, \theta =, r = 0.92, p = 16735, a = 13.55, b = 4.1, M = 0.2, N = 0.2, m = 3, h_c = 13.5, \sigma = .001, I_e = 0.01, c = 155, k = 506, I_c = 0.12, c_c = 0.2$$

Example 7- To solve expression 1, we have used the following data.

$$c_o = 500, s = 79.9, \theta =, r = 0.68, p = 1600, a = 1000, b = 4.5, M = 0.7, N = 0.9, m = 1.5, h_c = 5, \sigma = .01, I_e = 1, c = 50, k = 270, I_c = 0.02, c_c = 0.2$$

Table 6.1: Optimal solutions for the aforethought expressions

Examples	Expressions	t ₁	T	TC
1	1	.004403	1.22878	355474
2	2	.002403	1.11789	258447
3	3	.004590	0.70827	122688
4	4	2.73383	2.99566	126115
5	5	0.00545	0.00558	728506
6	6	0.55193	1.74747	354256
7	7	0.27775	0.99645	122746

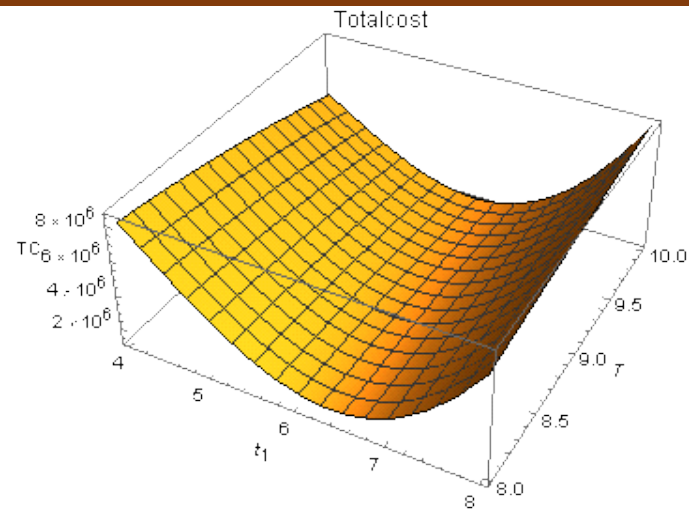


Fig. 1: Convexity of t_1 and T w.r.t Total cost for Expression 1

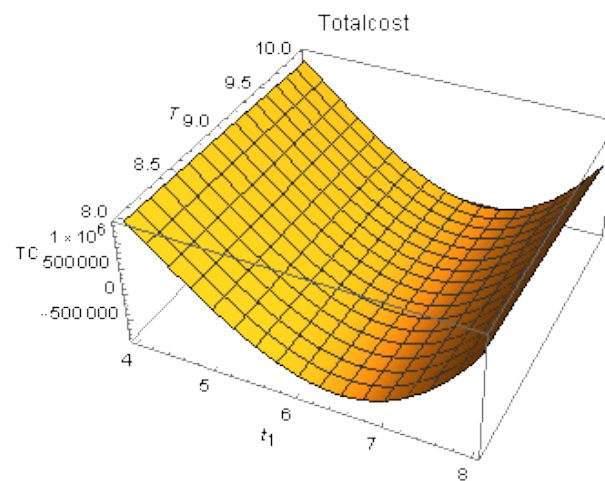


Fig. 2: Convexity of t_1 and T w.r.t Total cost for Expression 2

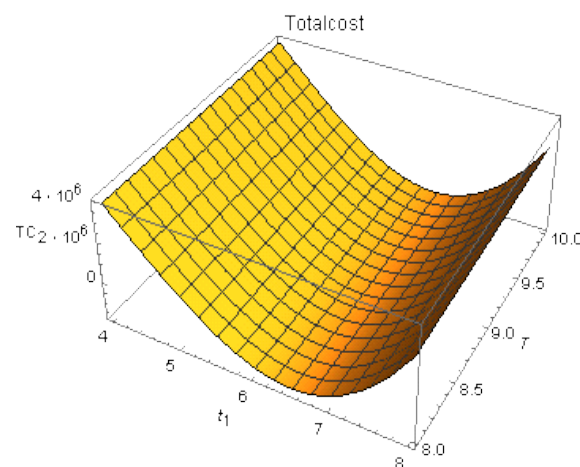


Fig. 3: Convexity of t_1 and T w.r.t Total cost for Expression 3

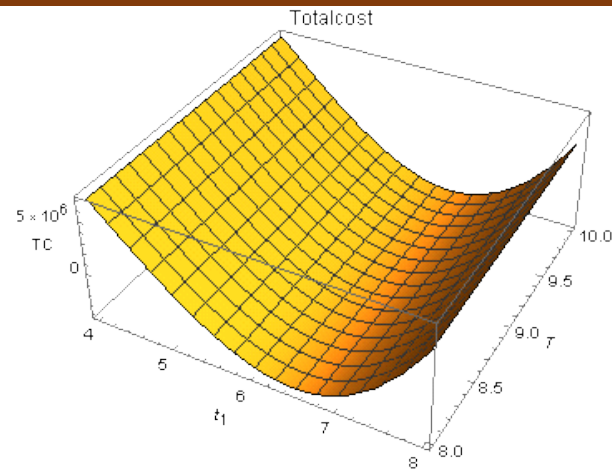


Fig. 4: Convexity of t_1 and T w.r.t Total cost for Expression 4

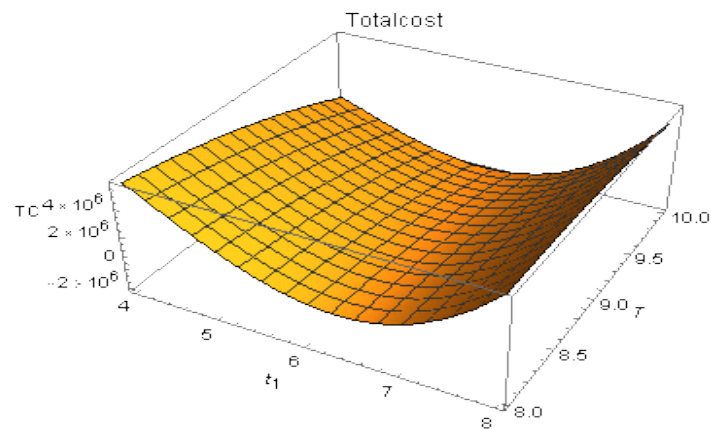


Fig. 5: Convexity of t_1 and T w.r.t Total cost for Expression 5

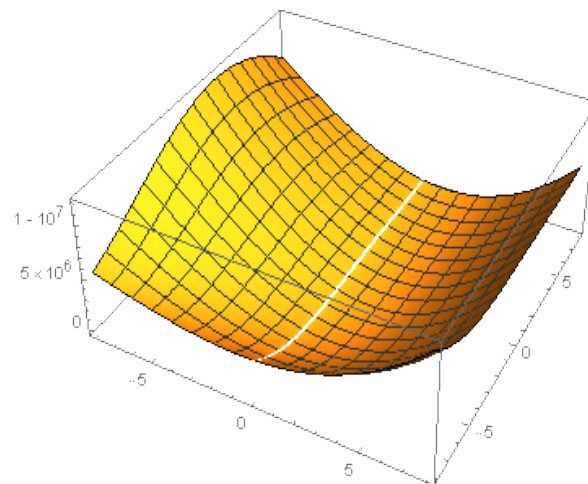


Fig. 6: Convexity of t_1 and T w.r.t Total cost for Expression 6

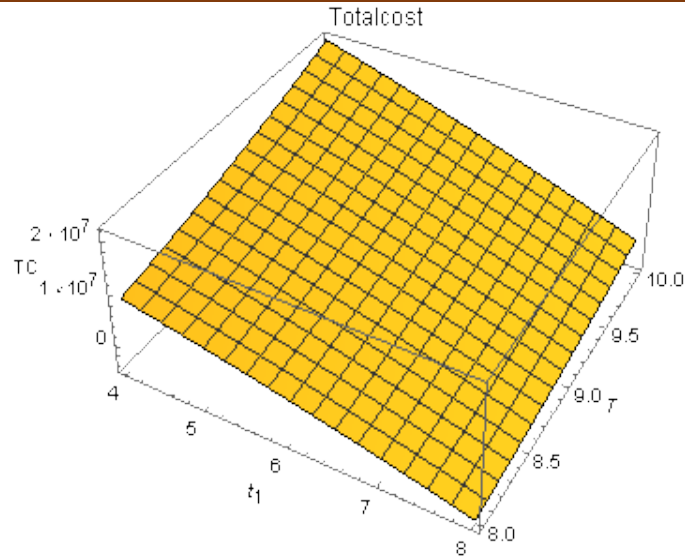


Fig. 7: Convexity of t_1 and T w.r.t Total cost for Expression 7

6. SENSITIVITY ANALYSIS

The aforethought expression 1 is used to investigate the effect on the optimal policy for changing in different values of the system parameters.

Table 6.2: sensitivity of various parameters to prove the validity of model

Variable	t ₁	T	TC	% Change in Variables		
				t ₁	T	TC
c _o						
-10	0.04403	1.22878	355374	0	0	-.028
-5	0.04403	1.22878	355424	0	0	-.014
0	0.04403	1.22878	355474	0	0	0
5	0.04403	1.22878	355474	0	0	.014
10	1.22878	1.22878	355474	0	0	.028
P						
-10	0.04210	1.24689	239001	-4.3	1.47	-32.7
-5	0.04116	1.24071	277852	-6.5	0.97	-21.83
0	0.04403	1.22878	355474	0	0	0
5	0.04500	1.21865	421366	2.2	-.82	18.5
10	0.04610	1.20893	487185	4.7	-1.61	37.05
M						

-10	0.04531	1.06359	519817	2.9	-13.4	46.23
-5	0.04525	1.14731	450955	2.7	-6.6	26.8
0	0.04403	1.22878	355474	0	0	0
5	0.04210	1.30800	230830	-4.38	6.4	-35.06
10	0.04316	1.35135	148151	-1.97	9.9	-14.52
K						
-10	0.04219	1.23837	247504	-4.7	0.78	-30.37
-5	0.04241	1.23339	301497	-3.6	0.37	-15.18
0	0.04403	1.22878	355474	0	0	0
5	0.04513	1.22411	409433	2.6	-0.38	15.17
10	0.04219	1.21988	462098	3.5	-0.72	29.99
A						
-10	0.04219	1.22924	352617	-4.7	0.05	-0.80
-5	0.04216	1.22894	354045	-4.24	0.01	-0.40
0	0.04403	1.22878	355474	0	0	0
5	0.04552	1.22834	356901	3.38	-0.03	0.41
10	0.04557	1.22804	358329	3.49	-0.06	0.83
I _c						
-10	0.04461	1.23225	418939	1.31	0.28	17.8
-5	0.04457	1.23039	387207	1.22	0.13	8.92
0	0.04403	1.22878	355474	0	0	0
5	0.04315	1.22663	351802	-1.99	-0.17	-11.16
10	0.04327	1.22545	291998	-1.7	-0.27	-17.85
h _c						
-10	0.04398	1.24114	346394	-.06	1.02	-2.55
-5	0.04400	1.23498	350949	-.11	0.50	-1.27
0	0.04403	1.22878	355474	0	0	0
5	0.04427	1.22234	359967	0.54	-0.43	1.26
10	0.04452	1.21608	364431	1.11	-1.03	2.51

The variation of the sensitivity analysis of the system with respect to system parameters are shown graphically by the figures 8, 9, 10, 11, 12, and 13.

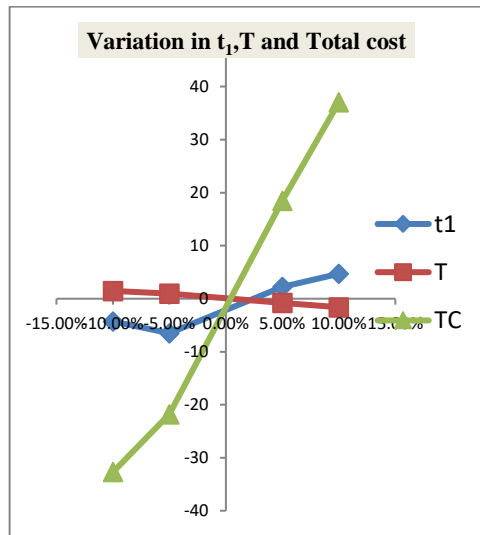


Fig 8: Graphical representation of sensitivity of the t_1 , T and total cost w.r.t. 'P'

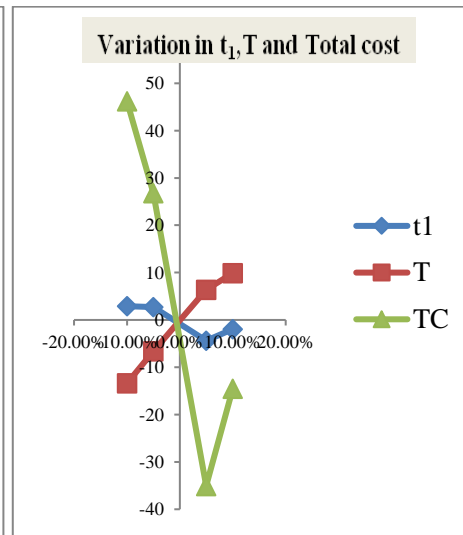


Fig 9: Graphical representation of the t_1 , T and total cost w.r.t. 'M'

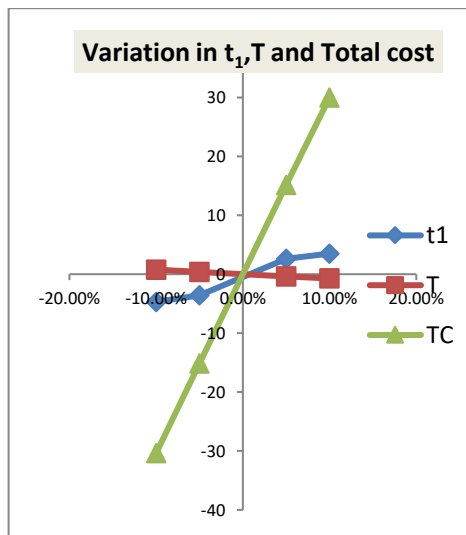


Fig .10: Graphical representation of sensitivity of the t_1 , T and total cost w.r.t. 'K'

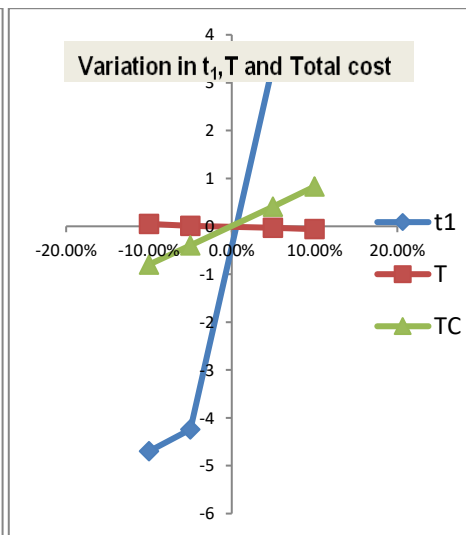


Fig 11: Graphical representation of the t_1 , T and total cost w.r.t. 'A'

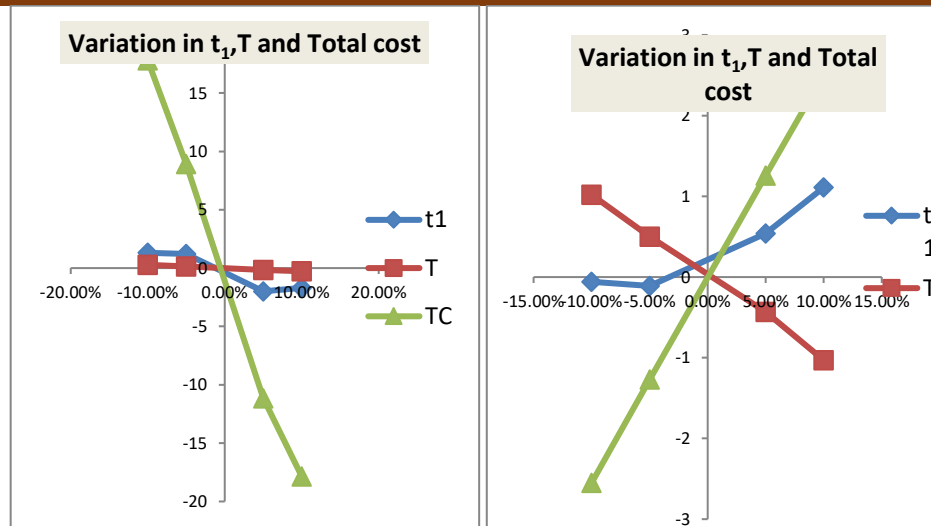


Fig 12: Graphical representation of sensitivity of t_1 , T and total cost w.r.t. ' I_c '

Fig 13: Graphical representation of the t_1 , T and total cost w.r.t. ' h_c '

7. OBSERVATIONS

1. Ordering cost is sensible toward Total Cost.
2. Production rate is directly sensitive toward total cost and t_1 and inversely sensitive toward T .
3. Expiry duration is direct sensitive toward T and inversely sensitive toward t_1 and total cost.
4. Deterioration cost is direct sensitive toward Total Cost and t_1 and inversely sensitive toward T .
5. Demand constant a' is direct sensitive toward t_1 and total Cost and inversely sensitive toward T .
6. Interest of the manufacturer is direct sensitive toward t_1 , T and total Cost.
7. Holding Cost is direct sensitive toward t_1 and total cost and inversely sensitive toward T .

8. CONCLUSION

In the proposed model the reliability is incorporated for the partial trade credit policy and deterioration of the items are considered for items such as perishable, those have maximum life time. The relation between reliability and total cost & the maximum life time and total cost is explored graphically. It is concluded from the graph that reliability of the product is important factor that is incorporated in total cost. As the more reliable product and total cost is inversely related. From the numerical implications it is found that the total cost is minimum for expression 3 i.e when cycle length lie between customer's trade credit period and manufacturer's trade credit period. So in that case expression 3 model is most economical amongst all models.

Many multinational companies provided the trade facility to improve the business. These companies can incorporate these models on their business model to cover more market. This model can be implemented in the market of perishable items as the cases are incorporated with expiry date. These models can be extended with fuzzy environment for some realistic situation.

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SEASONAL VARIATION OF FISH DIVERSITY IN KANSABEL, KUNKURI AND DULDULA PONDS OF JASHPUR DISTRICTS, CHHATTISGARH, INDIA

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In the recent decades, study on Indian water bodies and fish fauna has been done by a number of workers and researchers but there is no record of fish fauna in the ponds of Chhattisgarh, hence at the present time inquiry has been made to study the seasonal variation of fishes in ponds of Jashpur District of Chhattisgarh state. And for the study purpose three study place were selected and the name of the three places are Kunkuri, Kansabel and Duldula Pond and they were studied at the same location every month throughout the year. Total 20 species of fishes were studied which belongs to 10 families. After studying the study site of Kunkuri, Kansabel and Duldula pond, among this the high fish diversity was recorded at Site I followed by site III and site II and the lowest diversity was seen at site III and one important thing that is noticed that the diversity of species was low during the winter, and in monsoon the diversity of species was high and during summer season the diversity of species was moderate. And this diversity happen may be due to connection between fish diversity, length and water quantity of Pond.

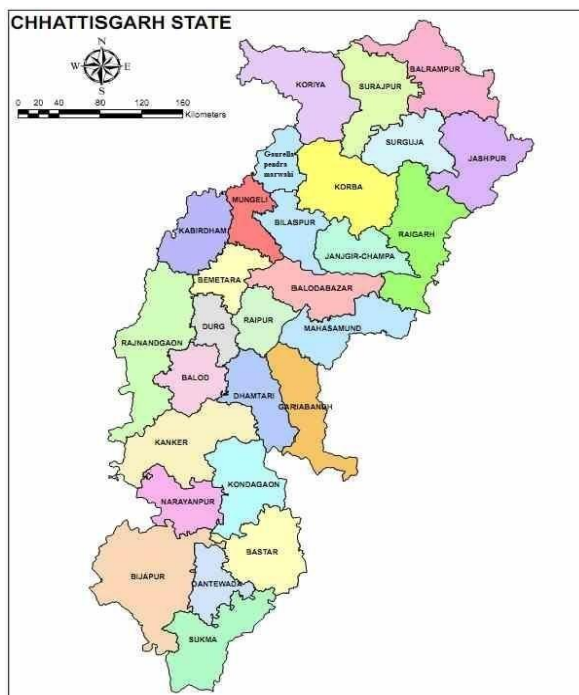
Key words:- Fish diversity, Ponds, Nets, Seasonal variation, Jashpur districts

1. INTRODUCTION

India is the country which exhibit great biodiversity in the world and it has ninth position in terms of fresh water mega diversity (Mitter et al 1997). Jashpur district is located in the north eastern part of the state of Chhattisgarh in India. It is a district of central Indian state of (C.G.) bordering Jharkhand and Odisha. If we talk about its length & breadth then its length is 150 km. From north-south and its breadth is 85 km. From its east-west and the total area is 6205 km². It is between 22°17' and 23°15' North latitude & 83°30' and 84°24' east longitude. Its geographical area was 6701 km². The Kunkuri, Kansabel and Duldula and the major part of the Jashpur district. It is said that the fish diversity community, structure and species assemblages are independent on many a biotic and biotic factors (Negi et al 2013).

Fishes play a major role to put up their part to the biodiversity of animals. Fishes are most important source of food; they are rich in vitamin and fatty acids. As well as fishes are referred as good food resource by doctor. Jashpur district is known as a tribal place it has its unique cultural & ecological identity. It also has great diversity of biological species. No fish

Diversity and seasonal variation of ponds was recorded in Jashpur district. Hence I decided to study about it.



Map of Chhattisgarh



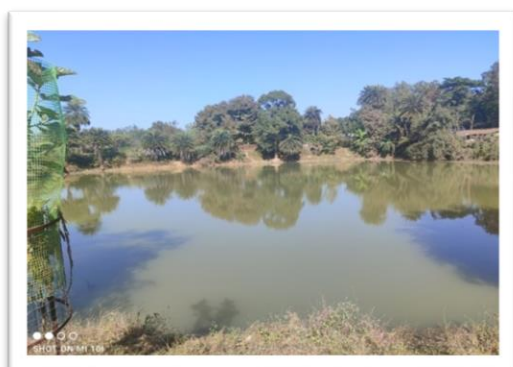
Jashpur District Map

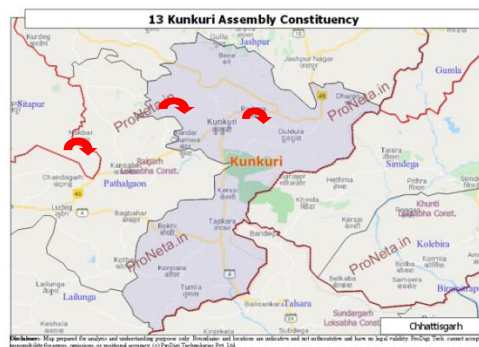
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2. MATERIAL & METHODS

Fish diversity has been studied by a number of workers on Indian pond and dam etc. But no information is available on the fish diversity of Jashpur district. I have selected three stations near Jashpur for the further work various ponds were studied like Kunkuri, Kansabeland Duldula etc. to know the fish distribution and seasonal variation. This work has been done in the year 2020-2021. At the study time samples were collected monthly with the help of various kinds of nets like gill nets, cast nets and drag nets etc.



Kunkuri Pond**Kansabel pond****Duldula Pond****Places where Fishes found**

During sampling days fish species were collected with the help of fisherman by using various nets and after that fish species which are collected for the further observation are cleaned and the colours. Colour pattern, spots, blotches number and design have been noted and the fish was preserved in 8-10% formalin. The local names of fishes were asked by the fisherman and the name was noted. Some characters were observed in fresh fish at the (spot) station and after that the fishes were brought to the laboratory of our college and identified following things provided by F. Day (1958), Jhingran (1982) & Shrivastava (1998).

After observing the specimens kept in jar in 8-10% formalin and the classification were done properly. For easy identification of main characters, clear and good sketch and details of fish from other reference book were taken.

3. RESULT AND DISCUSSION

The study was done between October 2020 to September 2021. During the study period total 20 species were studied which belongs to 10 families. The fish distribution was more in site I then II and after that in III. The low fish distribution at site II, It's thanks to the low length and water quantity of pond fishes were the species collected from all the sampling sites throughout the year. Fish distribution is said to the environmental factor, water quantity and length of pond. Both are length of pond and variety of fishes is co-related. The seasonal variation in fish distribution was detected. It absolutely was maximum in Monsoon and minimum in summer and winter.

**Table 1: Seasonal Variation of Fish Recorded in the Pond of Kunkuri, Kansabel and Duldula
(October 2020 to September 2021)**

S. N o.	Families	Fish Species	Winter Months of Oct 2020 to Jan 2021			Summer Months of Feb 2021 to May 2021			Monsoon Months of June 2021 to Sept 2021		
			No of Fish Found			No of Fish Found			No of Fish Found		
			Kunk uri Site I	Kansa bel Site II	Duld ula Site III	Kunk uri Site I	Kansa bel Site II	Duld ula Site III	Kunk uri Site I	Kansa bel Site II	Dul dula Site III

1	Notopteridae	<i>Notopterus notopterus</i>	+++	-	++	++	-	+	++++	-	+++
2	Cyprinidae	<i>Labeo rohita</i>	+++	++		+++	++	++	++++	+++	+++
					+++						
		<i>Labeo potail</i>	++	-	+	++	-	+	++	-	++
		<i>Puntius sophore</i>	++	++	++	++	+	++	+++	++	++
		<i>Puntius ticto</i>	+	+	+	++	+	+	++	++	+++
		<i>Oxygaster gara</i>	++	-	++	+	-	+	+++	-	++
3	Cobitidae	<i>Lepidoceph alchthys guntia</i>	-	++	+	-	+	++	-	+++	+++
4	Bagridae	<i>Mystus tengara</i>	+++	+	++	+++	++	++	+++	+++	+++
		<i>Mystus seenghala</i>	++++	++		+++	++	++	++++	+++	++
5	Saccobranchidae	<i>Heteropneustes fossilis</i>	++	+	++	++	+	+	+++	+	++
6	Clariidae	<i>Clarius batrachus</i>	++++	++		+++	+	++	++++	+++	+++
7	Ophiacephalidae	<i>Channa gachuga</i>	++	-	-	+	-	-	+++	-	-
		<i>Channa marulius</i>	+	-	-	+	-	-	++	-	-
		<i>Channa punctatus</i>	++	+	+	+	+	+	+++	++	++
8	Centropomidae	<i>Chanda nama</i>	+	-	+	++	-	+	++	-	++
9	Cichlidae	<i>Oreochromis mossambicus</i>	++	+	+	+	+	+	+++	++	++
		<i>Oreochromis niloticus</i>	+	-	+	+	-	+	++	-	++
10	Mastacembelidae	<i>Mastacembelus armatus</i>	++	-	+	+	-	+	++	-	++
		<i>Mastacembelus pancalus</i>	++	+	++	++	+	+	++	++	++

	<i>Macrogna-</i> <i>th</i>	++	++	-	++	+	-	++	++	-
	<i>us aculeatus</i>									
Total		41	18	29	35	15	23	54	28	41

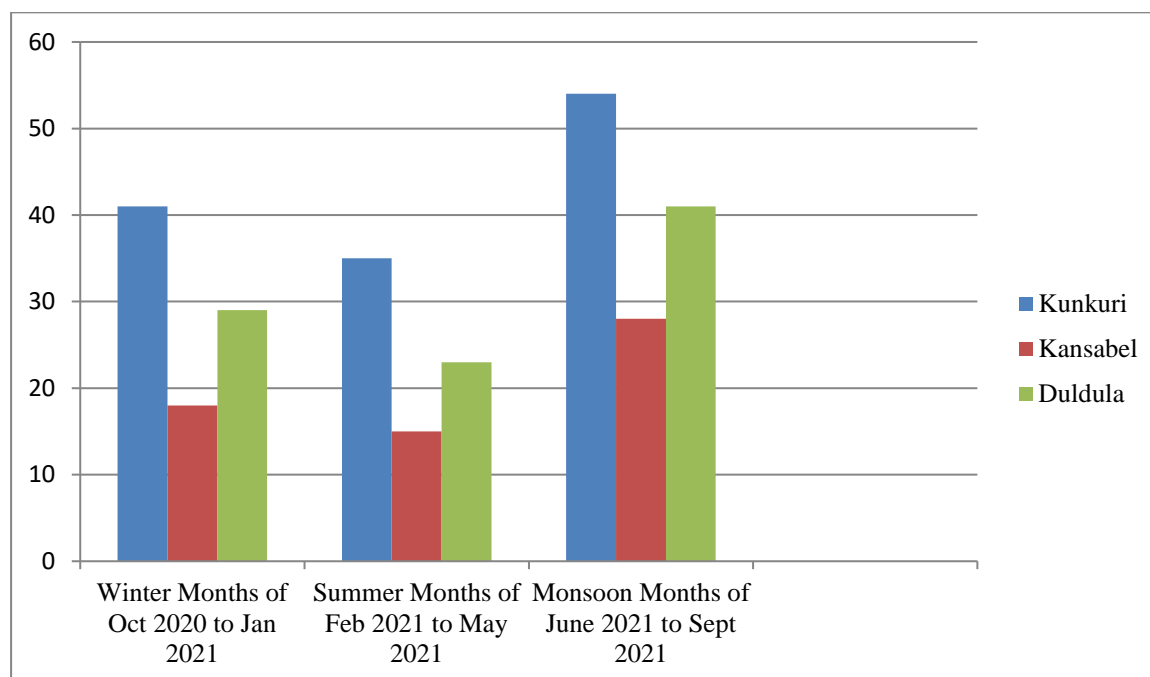


Figure 1:Graph showing seasonal variation of fish fauna in pond of Jashpur district

4. CONCLUSION

The present study may prove seasonal variation of fish valuable as a reference for evaluating the changes due to the environmental condition in the site and from the present study about the fish species. We came to know the information about the fish diversity in Jashpur district.

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STUDIES ON PHYTO-DIVERSITY OF ADJOINING BAUXITE MINE AREAS OF MAINPAT , CHHATTISGARH, INDIA

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A field survey was conducted to analyze phyto diversity of adjoining bauxite mine spoil of mainpat, Bauxite mine, India. Random sampling and line transect method was used to analyze the floristic composition of the concerned study sites. 31 plant species representing 19 families were recorded from the study sites. Herb layer dominated the floristic composition. Astraceae, Poaceae, Rubiaceae, Fabaceae, Asclepidaceae families were the dominant families in the concerned study sites. Random distribution of species found in study sites. *Spermacoceocymoides*, *Shorearobusta* reflected highest distribution in the concerned study sites. Proper selection of indigenous species would be fruitful for effective ecorestoration of bauxite mined wastelands.

Ke words: Bauxite mine, phyto diversity, Floristic composition, Distribution pattern.

1. INTRODUCTION

Excavation of bauxite performs by open cast mining across the world and produce mine spoil. Mine spoil change the physical and biological property of the particular land area and it also change the vegetative composition of mining area. Overlaying soil (mine spoil) alters the natural process of succession of herb, shrub and trees. Bauxite mined area represent itself as completely altered ecosystem. Mined area loss there natural function and work as man-made ecosystem (Yadav et al, 2022).

Mine spoil contains lack of biomass, biological agent and nutrients so it is adversely affect the plant growth. Due to lower biomass content, lower water holding property not support the quick colonization of flora so mining area vegetation not represent dense vegetation pattern. Reclamation of nutrient stock is necessary part of the mine spoil which is indirectly support the native flora recolonization and succession process. To obtained resilience of the altered ecosystem it is necessary to restore the mined area through native vegetation. For the successful restoration it is important to know which type family and genera of flora dominated and distributed adjoining area of mining site. The aim of the survey is to verify and identify the natural vegetation of bauxite mined area of Mainpat (IAI et al., 2016).

2. MATERIALS AND METHODS

Study site: In Mainpat bauxite mine area distributed in Sapnadar, Narmadapur and Jaljali near to Kesra mine. At present Survey conducted adjoining forest area of this bauxite mined area (Sapnadar, Tiger point and Jaljali) district belongs to Sarguja, Chhattisgarh, India. Such study sight belongs in Mainpat, Sapnadar (Lat 22.932, Long 93.329), Tiger point (Lat 22.850, Long 93.339) and Jaljali (Lat 22.813, Long 93.229).

Field survey: To analyze native flora species surrounding the bauxite mine area of Mainpat, Sargua, India. Field survey conducted adjoining area of bauxite mine in radius of 2-4 km. analysis done by line transect as well as random quadrat perform in study site. To analyze herb layer quadrat size is 1m², for shrub layer 5m² as well as quadrat size for tree layer is 10m². Collected flora samples were identified on the basis of the guideline of the subject expert and state forest research institute. Flora categorized as herb, shrub, trees and vines. To arrange taxa to family we adopted the APG IV (2016) (verma et. al 1985).

3. RESULTS AND DISCUSSION

Overall 32 plant species observed in which 30 plant species is angiosperms and 2 species includes pteridophytes plant group. All plant groups belong to 20 families and 32 genera. This overall vegetation distributed over adjoining forest area (Sapnadar, Tiger point and Jaljali) of Mainpat Bauxite mining (Sapnadar, Tiger point and Jaljali). Sum of all analyzed plants 18 (58.06%) plant species includes herb layer. 7 (22.58%) plant species denotes tree layer. 3 (9.67%) plant species represented shrub layer while 3 (9.67%) other plant species exhibits vines. According to table number 2 it is clear that herb is dominated among the all plant layers after that second dominant community is tree layer in adjoining forest area ((Sapnadar, Tiger point and Jaljali)) of Mainpat bauxite mine. Analysis represents that Asteraceae with 36.84% , Fabaceae with 15.789% and Combretaceae, Poaceae, Rubiaceae, Lamiaceae with 10.526%. (Gaston, 2000; Wang et al., 2009b; Fang et al., 2012)

Table 1: The inventory of Tree species present in the bauxite mine area of Mainpat

S.N.	Tree Species Name	Common Name	Family
1.	<i>Shorearobusta</i>	Sal	Dipterocarpeceae
2.	<i>Terminalia chebula</i>	Harra	Combretacea
3.	<i>Terminalia elliptica</i>	Saja	Combretacea
4.	<i>Syzigiumcumini</i>	Jamun	Myrtaceae
5.	<i>Cassia fistula</i>	Amaltash	Fabaceae
6.	<i>Lagerstroemia parviflora</i>	Sidha/senha,lendia	Lythraceae
7.	<i>Ficus beghalensis</i>	Bargad	Moraceae

Table 2: The inventory of Shrub species present in the bauxite mine area of Mainpat

S.N.	Tree Species Name	Common Name	Family
1.	<i>Colebrookeaoppositifolia</i>	Koriha	Lamiaceae
2.	<i>Lantana camara</i>	Satrangi	Verbenaceae
3.	<i>Woodfordiafruticosa</i>	Dhawayiphool	Lythraceae

Table 3: The inventory of Herb species present in the bauxite mine area of Mainpat

S.N.	Tree Species Name	Common Name	Family
1	<i>Elephanttopusscaber</i>	-	Asteraceae
2	<i>Eupatorium odorata</i>	-	Asteraceae

3	<i>Biden biternata (lour)</i>	Chirchitta	Asteraceae
4	<i>Agerantumconyzoides</i>	-	Asteraceae
5	<i>Syndrellanodifolia</i>	-	Asteraceae
6	<i>Sphagneticolatrilobata</i>	-	Asteraceae
7	<i>Emilia sonchifolia</i>	-	Asteraceae
8	<i>Desmodiumheterophyllum</i>	-	Fabaceae
9	<i>Oplismenushirtellus</i>	Basket grass	Poaceae
10	<i>Urochloadistachya</i>	-	Poaceae
11	<i>Adinatumcapillus veneris</i>	Maidenhair fern	Pteridophytaceae
12	<i>Cyopteris fragilis</i>	Fragile fern	Dryopteridaceae
13	<i>Spermacoceovalifolia</i>	Broad leaf false buttonweed	Rubiaceae
14	<i>Randiadumetorum</i>	-	Rubiaceae
15	<i>Triumfettapentendra A. Rich</i>	Chipki	Tiliaceae
16	<i>Asparagus racemosus</i>	Satawar	Liliaceae
17	<i>Stachys floridana</i>	-	Lamiaceae
18	<i>Thalictrum foliosum</i>	-	Ranunculaceae
19	<i>Baccopamonnier</i>	Bramhi	Plantaginaceae

Table 3: The inventory of Vine species present in the bauxite mine area of Mainpat

S.N.	Tree Species Name	Common Name	Family
1.	<i>Hemidesmum indicus</i>	Duddhi	Asclpiadaceae
2.	<i>Abrusprecatorius</i>	Gunja	Fabaceae
3.	<i>Smilax zeylanica</i>	-	Smilacaceae

Herb species is highly distributed over the adjoining forest floor of Sapnadar such as *Spermacoceovalifolia*, *Adinatumcapillus veneris*, *Agerantumconyzoides*, *Eupatorium odorata*, *Elephanttopusscaber*, *Triumfettapentendra A. Rich*, *Urochloadistachya*, *Oplismenushirtellus*, *Biden biternata (lour)*, *Cyopteris fragilis*, *Hemidesmum indicus*, lower distribution found species of *Baccopamonnier*, *Desmodiumheterophyllum*, *Emilia sonchifolia* while *Thalictrum foliosum*, *Syndrellanodifolia*, *Asparagus racemosus*, *Randiadumetorum*, vines *Abrusprecatorius*, *Smilax zeylanica* absent in sapnadar (Kar and Palit., 2014). Over all distribution of the species is same as sapnadar sampling point in adjoining forest area of tiger point Narnadapur while *Hemidesmum indicu*, *Asparagus racemosus* not seen during sampling (Singh, 2004 and Singh, 2006). Third sampling point jaljali also represents similar distribution as sapnadar and Tiger point but this area rich with *Asparagus racemosus*, while *Hemidesmum indicu*, *Desmodiumheterophyllum*, *Emilia sonchifolia* absent in quadrate. Distribution of shrub species *Colebrookea oppositifolia* reflect highly distribution in all three sight rarely distribution shown by *Lantana camara* and *Woodfordia fruticosa*. In the reference of tree layer *Shorea robusta*, *Terminalia chebula*, *Terminalia elliptica*, *Cassia fistula* reflected highest distribution in all three sampling points while *Ficus beghalensis* show highest distribution only jaljali sampling points. *Syzgium cumini* represent rare distribution in all three sites (Feilhauer and Schmidtlein 2009; Dogan and Dogan 2006).

4. CONCLUSION

Intensive study conducted to collect information regarding phyto diversity of study sites. Most of the flora belongs to angiosperm while 2 floras represent pteridophyta in adjoining forest of bauxite mine area. Herb layer dominated the trees and shrubs layers. The dominant family is Asteraceae, Poaceae, Rubiaceae and fabaceae that can be use as successful restorstion practice in bauxite mine area.

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SOIL TEXTURE ANALYSIS OF SURAJPUR DISTRICT OF CHHATTISGARH

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One of the most significant and commonly studied factors in soil research was texture. The ability to accurately determine soil texture in the field manually using "texture-by-feel". The texture of a soil is determined by its proportion of sand, silt, and clay. Texture influences almost every element of soil use, including engineering, agricultural, and natural ecosystem functions. Due to takes time and money to accurately determine soil texture in a lab, it frequently required to gauge soil texture in the field by feel. The Robinson pipette approach, however, more precise. Here, we used Pipette method to determine the amounts of sand, silt, and clay in a number of soil samples. Data from these techniques was used to calculate the permanent wilting point, the amount of water stored at field capacity, the soil erodibility coefficient, and the soil textural class (PWP). The Bouyoucos process resulted in the elimination of soil organic matter (SOM) and an increase in the concentration of dispersion agents. Measurements from the Pipette technique and hydrometer showed good correlation. The Bouyoucos approach underestimated the clay concentration when compared to the Pipette method. Ramanujnagar, Premnagar, Surajpur, Bhiyathan, Pratappur, and Odgi Block in the Surajpur district were good candidates for using the Bouyucus method to determine the soil texture and infer soil attributes.

Keywords: Soil texture, pipette technique, Bouyoucos method, soil organic matter (SOM), silt, clay and sand.

3. INTRODUCTION(Level 1: First Section)

A thin crustal stratum of the earth is referred to as soil and serves as a natural substrate for plant growth. For plants to develop and produce the food and fibre we need, soil provides a growing substrate. It is important to examine the overall possible impact of preservation efforts because soil is seen as a fundamental component of ecosystems that must be preserved in the context of the environment. When a soil deteriorates, associated ecological components deteriorate as well [1]. The most crucial natural resource for agricultural activities was probably soil. Providing fuel, food, and fodder to meet the increasing demands of people and other animals who depend on agriculture and related activities. To confine the growth and supply essential nutrients, plants require an adequate amount of quality soil. Food, fibre, beautiful plants, lumber, and eventually biofuels, all grown in soil. Several soil management techniques required for different agricultural purposes [2]. Agricultural and forest products, which were generated directly from the soil, also necessary for industrial product variations. Understanding the potential, constraints, and uses of soil is essential for long-term production, as is knowing how to preserve soil without causing it to degrade. For successful planning and best use in agriculture output, it's crucial to understand different types of soil and their distribution. Using the soil assessment is the only way to make an accurate inventory of the soil [3]. Soil evaluation, which also offers comprehensive information on a number of soil factors, determines agricultural production restrictions and the potency of the soil [4]. However, State of Chhattisgarh located in central India. The lowlands of Chhattisgarh, the Bastar Plateau, and the Northern Hill

Regions, three main geographical divisions of the state. There are several states that border Chhattisgarh: Uttar Pradesh in the north, Bihar in the northeast, Orissa in the east, Andhra Pradesh in the south and southeast, Maharashtra in the southwest, and Madhya Pradesh in the west. The primary crop in the state is certainly paddy. Chhattisgarh had been largely covered with red and yellow soil. There numerous types of soil occurs in Chhattisgarh. The red colour of soil, cause of ferric oxide which did not sufficiently hydrated and moderately hydrated oxides. The soil's yellow tint also caused by iron oxides. In the region of soils, the lower portions of the soil layer concentrated with important mineral elements like nitrogen, phosphorus, lime, and potash. The tropical yellow and red soils of the area, along with the red sand soils, offer a texture which suitable for growing crops. Different soils have various capacity for percolation and water retention, as well as for production.

One of the most significant and commonly studied factors in soil research is texture. The ability to accurately determine soil texture in the field manually using "texture-by-feel" is well known to soil scientists with field experience. Due to the widespread usage of pedotransfer functions, accurate estimations of soil particles with sizes smaller than 2 mm and larger than 2 mm in size are now more crucial than ever. Pedotransfer functions make an effort to forecast soil water properties [5, 6], solute transport [7], and particle density [8] based on clay and silt concentrations. Soil spectroscopy has been accepted as a quick method to forecast the concentrations of clay and analysing silt using standard values from conventional soil texture analysis [9-11]. Another quickly developing area of research using the pedotransfer ideas is the prediction of soil clay content from soil water parameters [12, 13]. To achieve optimal dispersion of micro-aggregates, the removal of soil organic matter (SOM) advised as a pre-treatment prior to particle size characterization (e.g., [14]). In soil research, a combination of sieving and sedimentation procedures, with the latter often carried out with an areometer or a pipette device, is the accepted method for analysing the particle-size distribution [15]. The sieve-pipette method is a widely accepted method [14, 16]. The relative mass of the clay, silt, and sand fractions produced using this method can be used to systematically classify the soil texture using the appropriate nomenclature.

The Pipette method entails measuring the suspension's constituent parts as they move through a solids barrier with a predetermined volume. According to Bouyoucos' method, the density of solution, determined by hydrometer, used to estimate the size of the suspended solids. The samples handled differently in Bouyoucos and Pipette methods before sedimentation. While the Bouyoucos method does not suggest this pre-treatment, according to the Pipette Method, the sample's soil organic matter (SOM) should be destroyed [17]. The Bouyoucos method, according to Gee and Or [14], the Pipette method's clay fraction determination duration is greatly impacted by the solution's temperature and frequently takes longer than two hours, whereas the clay fraction determination after two hours of sedimentation. The analytical outcomes produced using the Pipette and Bouyoucos procedures differ as well. Depending on the analysis's goal, these distinctions may or may not be significant. In Uruguay, the gravimetric content of water under field capacity (FC) and under the permanent wilting point (PWP) has been estimated using the soil texture [18]. The estimation of soil porosity and permeability, K factor, utilised in worldwide and soil loss equation represents another significant application of the soil particle size distribution [19]. For routine analyse, Bouyoucos method was more convenient, and easier to use. Although, it was not as efficient as the Pipette approach. Bouyoucos' technique can be enhanced, but, depending on the soil type, by eliminating SOM and spreading colloids before sedimentation procedure [20]. Moreover, Gee and Bauder's suggestion to sieve the soil sample through a 53 m screen could be used to quantify sand component [16]. Here, we discussed a comparison of the measured silt, clay, and sand contents via pipette approach for 6 blocks, i.e., Ramanujnagar, Premnangar, Surajpur, Bhiyathan, Pratappur and Odgi Block of Surajpur district. To determine the soil textural class, the variations were assessed.

4. MATERIALS AND METHODS

The process involves dispersing the SOM further with a larger dose of sodium hexametaphosphate (Calgon, Bioquim, Montevideo, Uruguay) after dissolving the SOM with hydrogen peroxide. SOM was removed from a 70.0 g soil sample by adding successive aliquots of 40.0 mL of hydrogen peroxide (H_2O_2 , 130 volumes) until the reaction's effervescence was minimal. A heated plate set to 80 °C was used for the procedure. The oxidised samples were put into 80°C forced-air oven to dry. To obtain dispersion, 50.0 g of dry soil sample was blended for 16 hours in a reciprocating shaker with 100 mL of 25% sodium hexa metaphosphate (technically Calgon, Bioquim, Montevideo, Uruguay). After that, ingredients was placed in blender cup and blended with an electrical mixer for two minutes. The contents of each cup were transferred to a 2.0 L sedimentation cylinder, which was then filled with deionized water until it reached the 2000 mL threshold. Afterwards, by hand stirring, the slurry was combined.

A hydrometer was used to measure the solids in the suspension after 40 seconds of decantation, and another measurement was taken after two hours. The measurement was made when the suspension was between 20 and 22 °C, and the temperature was then changed. The first reading was used to estimate how much sand was there, and the second reading, obtained after two hours, was used to calculate how much clay was present. The difference between those two observations served as the basis for calculating the silt fraction. After sample dispersion and SOM destruction, sand was removed from the sample using a 53 m mesh sieve before being gravimetrically measured. A blank test was conducted before the hydrometer was utilised. This involved taking hydrometer measurements in the same cylinder every 40 seconds for two hours while dispersant samples were present, and then taking water samples only.

$$\text{Sand \%} = 100 - (\text{Lecture 40 s} \times 2 - \text{blank Lecture}) \times 100 / \text{oven - dry wt.} \quad [1]$$

$$\text{Clay \%} = (\text{Lecture at 2 hours} \times 2 - \text{blank Lecture}) \times 100 / \text{oven-dry wt.} \quad [2]$$

$$\text{Silt \%} = 100 - \text{sand \%} - \text{clay \%} \quad [3]$$

After subjecting the samples to dry combustion at 900 °C, the LECO TruSpec's infrared detection system was used to calculate the amount of soil organic carbon present (Wright and Bailey, 2001). The soil texture data collected using different strategies was used to calculate the FC, the PWP, and the K coefficient (USLE/RUSLE) and to determine which approaches were more accurate in representing the soil texture in comparison to other soil characteristics. Using Molfino and Califra's formulae, the FC and the PWP were estimated [18]. Puentes and Szogi[19] was used to compute the K coefficient given the following assumptions: A code of permeability, a code of structure, and a content of extremely fine sand making up a third of the total amount of sand are all required. Using the soil textural triangle suggested by the USDA, the texture class was determined [14].

5. RESULTS AND DISCUSSION

The study aids in determining the advantages of various soil properties and oxygen concentration from Surajpur District in Sarguja Division, Chhattisgarh, India (Blocks-Ramanujnagar, Premnagar, Surajpur, Bhaiyathan, Pratappur, Odgi).

4.1 PHYSICAL PROPERTIES

The experiment helps to determine the benefits of various structural configurations and oxygen concentration in soil from the Surajpur District in the Sarguja division of Chhattisgarh, India. Soil texture is an example of a physical property. Colour, bulk density, particle density, porosity, and maximum water holding capacity of the soil are important factors in optimum crop productivity and soil health.

The soil in this area is primarily black. Labs for soil analysis focus at the physical attributes of the soil. To determine the soil's textural composition, filtering and sedimentation techniques are used. A large number of samples are gathered, each with a distinctive texture. The soils are dried and finely powdered in an oven. Sand rates increase with soil residue and earth content levels, but they decrease as water holding capacity increases. Table 1, 2, 3, 4, 5 and 6 displays the physical characteristics of six different blocks of soil in the Surajpur District of Chhattisgarh, India.

Table 1: Analysis of Ramanujnagar Block's soil texture

S. NO	SAMPLE	SOIL TEXTURE			WP	Wt	γ	Porosity
		Sand	Silt	Clay				
1	S1	64.41	22.23	13.36	0.089	0.200	0.430	0.46
2	S2	60.81	23.12	16.07	0.104	0.215	0.358	0.46
3	S3	53.21	25.12	21.67	0.137	0.232	0.348	0.48
4	S4	50.72	26.21	23.07	0.145	0.236	0.346	0.49
5	S5	49.12	28.31	22.57	0.144	0.235	0.347	0.50
6	S6	47.56	29.37	23.07	0.139	0.233	0.348	0.53

Table 2: Analysis of Prem Nagar Block's soil texture

S. NO	SAMPLE	SOIL TEXTURE			WP	Wt	γ	Porosity
		Sand	Silt	Clay				
1	S1	64.41	21.23	14.36	0.091	0.220	0.431	0.45
2	S2	60.81	22.12	17.07	0.106	0.214	0.359	0.45
3	S3	53.21	24.12	22.67	0.138	0.238	0.349	0.48
4	S4	50.72	25.21	24.07	0.149	0.239	0.348	0.50

5	S5	49.12	27.31	23.57	0.146	0.238	0.349	0.51
6	S6	47.56	28.37	24.07	0.142	0.237	0.349	0.52

Table 3: Analysis of Surajpur Block's soil texture

S. NO	SAMPLE	SOIL TEXTURE			WP	Wt	γ	Porosity
		Sand	Silt	Clay				
1	S1	60.41	23.23	16.36	0.092	0.221	0.432	0.48
2	S2	57.81	24.12	18.07	0.107	0.216	0.358	0.48
3	S3	51.21	25.12	23.67	0.139	0.239	0.340	0.49
4	S4	48.72	26.21	25.07	0.150	0.241	0.349	0.51
5	S5	45.12	28.31	26.57	0.148	0.239	0.350	0.52
6	S6	44.56	29.37	26.07	0.146	0.238	0.350	0.53

Table 4: Analysis of Bhiyathan Block's soil texture

S. NO	SAMPLE	SOIL TEXTURE			WP	Wt	γ	Porosity
		Sand	Silt	Clay				
1	S1	61.41	23.23	15.36	0.093	0.223	0.431	0.49
2	S2	57.81	25.12	17.07	0.108	0.218	0.357	0.49
3	S3	51.21	26.12	22.67	0.140	0.241	0.341	0.50
4	S4	47.72	28.21	24.07	0.153	0.246	0.350	0.51
5	S5	45.21	29.31	25.57	0.149	0.242	0.351	0.52
6	S6	45.56	30.37	24.07	0.147	0.243	0.352	0.53

Table 5: Analysis of Pratappur Block's soil texture

S. NO	SAMPLE	SOIL TEXTURE			WP	Wt	γ	Porosity
		Sand	Silt	Clay				
1	S1	61.41	24.23	14.36	0.094	0.222	0.432	0.50
2	S2	57.81	26.12	16.07	0.110	0.219	0.358	0.51
3	S3	49.21	27.12	23.67	0.145	0.242	0.342	0.52
4	S4	45.72	29.21	25.07	0.154	0.248	0.351	0.53
5	S5	43.12	30.31	26.57	0.150	0.243	0.353	0.54
6	S6	45.56	31.37	23.07	0.151	0.245	0.354	0.55

Table 6: Analysis of the Odgi Block's soil texture

S. NO	SAMPLE	SOIL TEXTURE			WP	Wt	γ	Porosity
		Sand	Silt	Clay				
1	S1	59.41	25.23	15.36	0.095	0.223	0.433	0.49
2	S2	56.81	26.12	17.07	0.112	0.212	0.359	0.51
3	S3	47.21	28.12	24.67	0.146	0.243	0.343	0.52
4	S4	44.72	29.21	26.07	0.155	0.249	0.352	0.53
5	S5	41.12	31.31	27.57	0.152	0.248	0.354	0.54
6	S6	43.56	32.37	24.07	0.153	0.247	0.355	0.55

6. CONCLUSION

Researchers in the fields of agriculture, remote sensing, among others, will find these insights useful. An essential need for maintaining agricultural soil and focusing on regions of land degradation is monitoring regional variability and mapping soil properties. This would help to reduce the amount of inputs which given to soil in the form of supplements and prevent the soil from becoming overburdened, which could cause contamination and land degradation. The results suggest that even within a single local authority's jurisdiction, soil characteristic geographical distribution and spatial relationship could differ. The majority of soil texture data has historically been gathered through field soil sampling and laboratory analysis. These techniques were highly accurate, but time-consuming, expensive, and labour-intensive, so cannot be utilised for rapid soil texture monitoring. Hence, the soil's structure and texture, as well as its capacity to transport dissolved compounds, all dependent. The pipette method is a useful tool for measuring the functional properties of soil or determining the soil's texture within the context of precision farming. One of the crucial aspects of soil for managing agriculture was its texture. Sand, silt, and clay content affect permeability, porosity, ease of tillage, and nutrient retention in different ways. These results can be used to improve the livelihoods of small-scale farmers and offer recommendations for the area's best management practises. Farmers can boost crop yield by choosing the best seeds for their crops.

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DESIGN OF INTELLIGENT PORTFOLIO OPTIMIZATION SYSTEM USING MULTIPLE CRITERIA DECISION-MAKING TECHNIQUE

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Portfolio optimization is the professional management of various securities like shares, bonds and other securities and assets like real estate in order to meet specified investment goals for the benefit of the investors. If a person owns more than one security, he has an investment portfolio. The main target of the portfolio owner is to increase value of portfolio by selecting investments that yield good returns with low risk. In this research work we are using MADM and MODM methods for portfolio selection, optimization and stocks diversification to designing frameworks for an optimal portfolio selection to design an intelligent portfolio optimization system.i.e. developed system would distribute the available wealth among several available assets (Stocks) to achieve a specific goal and to earn high return with minimum risk.The portfolio data set is downloaded from different financial sites like www.bseindia.com, www.yahoofinance.com etc. These systems help investor to earn maximum profit by diversifying total available fund in a smart way. We are developing a novel intelligent techniques-based portfolio optimization system.

Keywords- MADM, MODM, Stocks, Portfolio Optimization, Portfolio Data Set.

1. INTRODUCTION

Portfolio optimization is the process of selection thebest portfolio (asset distribution), out of the set of all portfolios being considered, according to some objective. The objective typically maximizes factors such as expected return, and minimizes costs like financial risk. Portfolio optimization is nothing but a process where an investor receives the right guidance concerning the selection of assets from the range of other options, and in this theory, projects/programs are not valued as a part of a particular portfolio. As per portfolio definition, it is a collection of a wide range of assets that are owned by investors. The said collection of financial assets may also be valuables ranging from gold, stocks, funds, derivatives, property, cash equivalent, bonds, etc.

Based on investment strategies, these following are some common types of portfolios: Income portfolio, this type of portfolio emphasises more on securing a steady flow of income from investment avenues. In other words, it is not entirely focused on potential capital appreciation. For instance, income-driven investors may invest in stocks that generate regular dividends instead of those who show a track of price appreciation. Growth portfolio, A growth-oriented portfolio mostly parks money into growth stocks of a company who are in their active growth stage. Typically, growth portfolios are subject to greater risks. This type of portfolio is known for presenting high risk and reward aspects. Value portfolio, such a portfolio puts money into cheap assets in valuation and focuses on securing bargains in the investment market. When the economy is struggling, and companies are barely surviving, value-oriented investors look for profitable companies whose shares are priced lower than their fair value. When the market revives, value portfolio holders generate substantial earnings.

There are many advantages of Portfolio Optimizationsuch as Maximizing Return, the first and foremost objective of portfolio optimization is maximizing return for a given level of risk. The risk-return trade-off is maximized at the point on the efficient frontier that represents the optimal portfolio. So, managers pursuing the process of portfolio optimization are often able to achieve high returns per unit of risk for their investors. This helps with client satisfaction. Diversification, optimal Portfolios are well diversified in order to do away with the unsystematic risk or non-priced risks. Diversification helps in protecting investors against the downside in case a particular asset underperforms. The other assets in the portfolio will protect the investor's portfolio from crashing, and the investor stays in a comfortable zone. Identifying Market Opportunities,when managers indulge in active portfolio management, they track a lot of market data and update themselves with the markets. This practice can help them identify opportunities in the market ahead of others and take advantage of those opportunities for the benefit of their investors.

In the proposed research work we are going to design frameworks for an optimal portfolio selection to design an intelligent portfolio optimization system. A decision support system (DSS) based on intelligent technique is being utilized by many financial institutions to select a set of stocks as a portfolio selection to maximize investors return and to minimized theirrisk. There are many research techniques has been available for portfolio optimization like AHP. TOPSIS, SAW, Goal Programming, GeneticAlgorithmetc. In recent years, Dempster- Shafer theory (DST), CoCoSo method with Heronian mean operator, proposed semi – parametric framework, Machine Learning, Explainable Artificial Intelligence, Semiparametric method, Multifactor Portfolio Optimization method, SMA strategy, Deep Learning and many more techniques has been implemented by researchers.

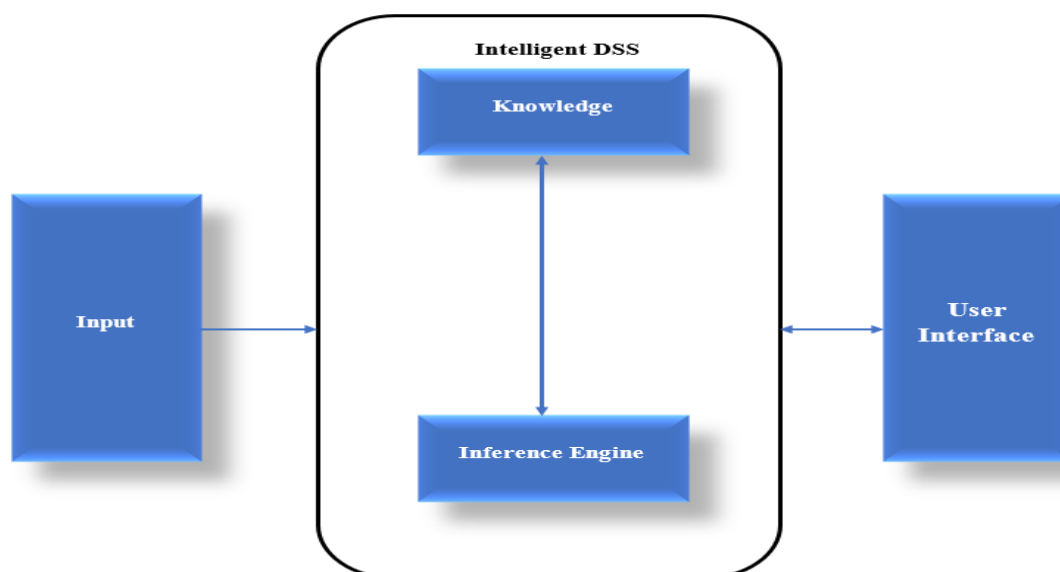


Figure 1: A Typical View of Decision Support System

PROPOSED STEPS OF RESEARCH

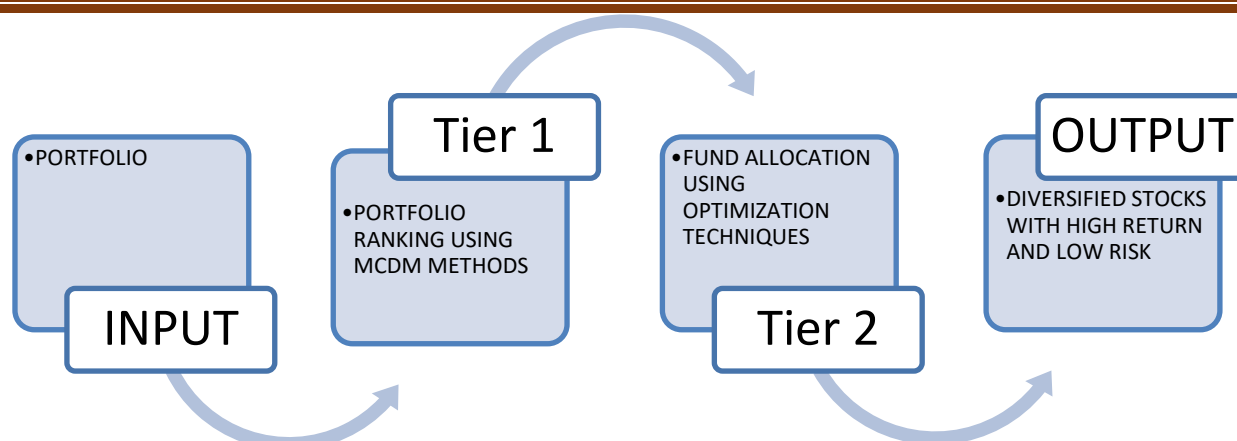


Figure 2:Proposed Steps of Portfolio Selection and Optimization

2. REVIEW OF LITERATURE

Chaweewanchon et al. (2022) has proposed a novel approach to portfolio formation strategy based on a hybrid machine learning model that combines convolutional neural network (CNN) and bidirectional long short-term memory (BiLSTM) with robust input features obtained from Huber's location for stock prediction and the Markowitz mean-variance (MV) model for optimal portfolio construction.

Cerneviciene et al. (2022) have presented a review and classification of multi-criteria decision-making methods that help to achieve the goal of forthcoming research: to create artificial intelligence-based methods that are explainable, transparent, and interpretable for most investment decision-makers.

Han et al. (2022) have proposed an innovative semi parametric method consisting of two modeling components: the nonparametric estimation and copula method for each marginal distribution of the portfolio and their joint distribution, respectively.

DongJun Lee (2022) has reviewed the problem of the traditional modern portfolio approach that is used by Korean financial institutions. For reasonable investment of institution, suggest improved factor-based allocation approach.

Sen et al. (2022) have presented a systematic approach to portfolio design using two risk optimization approaches, the hierarchical risk parity algorithm, and the hierarchical equal risk contribution algorithm on seven critical sectors and the NIFTY 50 stocks listed in the National Stock Exchange of India. of the Indian stock market.

Xue et al. (2022) has established a portfolio optimization model consisting of a weighted unidirectional dual-layer LSTM model and an SMA-slope strategy. The weighted unidirectional dual-layer LSTM model is developed to predict the daily prices of gold/Bit coin, which addresses the traditional problem of prediction lag.

Aggarwal et al. (2022) explained the contribute to academic literature by focusing on the performance and incentives of PMS funds market in India, which is largely unexplored till now.

Stortiet et al. (2022) proposed framework accounts for the dependence structure among asset returns, without assuming the distribution of returns. A simulation study is conducted to evaluate the finite sample properties of the employed estimator for the proposed model.

Nimmakantiet.al. (2022) investigates the nature and relationship of project portfolio control techniques and portfolio management performance, and how this relationship is moderated by situational idiosyncratic of internal and external dynamics, industries, governance types, and geographic location.

Narang et.al. (2022) explain stock portfolio selection is to distribute capital to selected stocks to get the most profitable returns at a lower risk. The performance of a stock depends on a number of criteria based on the risk return measures. Therefore, the selection of shares is subject to fulfilling a number of criteria. In this paper, we have adopted an integrated approach based on the two-stage framework.

Skoruchiet.al. (2022) examine the high sensitivity of the Iranian capital market to the exchange rate fluctuations in the different scenarios due to the lack of a unified view of the value of that rate among experts as one of the mentioned factors and obtain its value using Dempster–Shafer theory (DST).

Yufeng et.al. (2021) investigates a new stock, it is difficult to predict returns and risks in a general way without the support of historical data. Therefore, a portfolio optimization model with an uncertain rate of return is proposed.

Conlon et.al. (2021) Find that factors based on autoencoder neural networks exhibit a weaker relationship with commonly used characteristic-sorted portfolios than popular dimensionality reduction techniques. Machine learning methods also lead to covariance and portfolio weight structures that diverge from simpler estimators.

Liu et.al. (2021) establish different optimization schemes to compare and study the portfolio problem and then use MATLAB to solve the modelling and programming problem, calculate the highest return rate and the lowest risk value before and after optimization, and then make a comparative analysis to get a better optimization scheme.

Anand (2021) explained the globally leading stock market NSE stock price prediction is conducted by utilizing five deep learning architectures. The stock price of Bharti Airtel is used to train CNN, LSTM, RNN, MLP, and SVM networks. The stock prices of Tata Steel, HCL, Infosys, and Bajaj Fiserv are acquired from the NSE stock market and compared to the stock prices projected using the derived models.

Rekha et.al. (2020) The portfolio management goal is capital security, income stability, economic growth, market capitalization, equity and diversification, and good financial condition. Security not only protects the firm durability but also perseveres with purchasing power. Complex revenues facilitate the flow of revenue ie more efficiency and order.

Agrawal et.al. (2020) explained the risk and return analysis with the tools like returns, risk parameters, Sharpe ratio, etc. The paper also looks at the best possible investment avenue in the period defined. One of the objectives of this paper is that investor need to know about the risk and return associated with the investment avenue.

Zhang et.al. (2020) presented circumvents the requirements for forecasting expected returns and allows them to directly optimize portfolio weights by updating model parameters.

Jabbar et.al. (2020) revealed the existence of factor market imperfection. Frequent reallocations of land and providing access to credit for input are important to enhance the performance of the sector. Survey data from 350 observations was used to meet the objectives of the study.

Khodamoradi et.al. (2020) In this paper, first study mean-absolute deviation (MAD) portfolio optimization model with cardinality constraints, short selling, and risk-neutral interest rate. Then, in order to insure the investment against unfavourable outcomes, an extension of MAD model that includes options is considered.

Milhomemet.al. (2020) the paper presents a useful discussion on aspects of portfolio optimization, both for researchers and investors and for finance professionals. A point of attention should be given to the input data of optimization models. Depending on the degree of the estimation error of these input parameters, the optimization results may be lower than the results of the 1/N trading strategy.

Tyagi et.al. (2019) proposed current study is to examine the most preferred investment option among institutional investor in India and analysis the factors which impact their investment strategy in India. The study also attempts to better understand the impact of certain demographic factors such as age, area of operation, type of operation, asset under management, experience and qualification on the behaviour of institutional investor in India.

Oliinyket.al. (2019) described the optimal function of managing the investment portfolio in the form of a share of the income received is found. Numerical results of optimal management of investments in a financial portfolio from the financial institution as well as from the creditor are presented.

Danesh et.al. (2018) identifies the key challenges of PPM, proposes a new framework for classifying PPM MCDM related methods and presents a literature review of applications of MCDM methods to PPM. Its success is closely associated with the degree of understanding of its issues and the quality of decisions made at the portfolio level which can be addressed using multi-criteria decision-making (MCDM) methods.

Wang et.al. (2018) presented examples for the multiple optima, emphasize the risk of overlooking the multiple optima by (ordinary) quadratic programming, and report the software failure by parametric quadratic programming.

Calderini et.al. (2018) In this paper assess whether there is a correspondence between the use of PPM processes and techniques, and improvements in the performance of projects and portfolios of projects. Based on our findings, we introduce a three-stage classification scheme of PPM adoption, and present a strong correlation between (1) increasing adoption of PPM processes and a reduction in project related problems, and (2) between PPM adoption and project performance

Supriya (2018) analyses these ten stocks from Investment Perspective and shows how a portfolio can be created using these stocks. This paper, with the help of optimization model, tries to understand the effect of diversification and find out the optimal number of stocks considering the risk and return. The model duly considers the investor's appetite as well. The research indicates that if Financial Analysis is done in a right manner, we can analyse Investments rigorously and Manage Portfolios by using Excel and Google Sheets.

Hiransha et. al. (2018) observed that CNN is outperforming the other models. The network was able to predict for NYSE even though it was trained with NSE data. This was possible because both the stock markets share some common inner dynamics. The results obtained were compared with ARIMA model and it has been observed that the neural networks are outperforming the existing linear model (ARIMA).

Jiang et.al. (2017) presented a financial-model-free Reinforcement Learning framework to provide a deep machine learning solution to the portfolio management problem. The framework consists of the Ensemble of Identical Independent Evaluators (EIIE) topology, a Portfolio-Vector Memory (PVM), an Online Stochastic Batch Learning (OSBL) scheme, and a fully exploiting and explicit reward function.

Philip et.al. (2016) explained the power of the equally weighted S&P 500 portfolio over Sharpe's market capitalization weighted S&P 500 portfolio. We proceed to consider the MaxMedian rule, a non-proprietary rule which was designed for the investor who wishes to do his/her own investing on a laptop with the purchase of only 20 stocks.

Quande et.al. (2015) described the Conditional Value at Risk (CVaR) to measure the portfolio risk, and propose a mean-CVaR portfolio selection model. In addition, some real-world constraints are considered. The constructed model is a non-linear discrete optimization problem and difficult to solve by the classic optimization techniques.

Pachori (2015) focuses keenly on surveying the various previously done research work in the field of stock selection and optimisation and then based on the research papers surveyed in the field he proposes a two-tier model. The survey phase focuses more on hybrid model which comprises of two tiers.

Gerald et.al. (2014) presents a general proposal template in considerable detail, suitable for presentation to the corporate executive.

Zabiulla (2014) examines whether Indian fund managers follow an active portfolio strategy. Inter alia, the impact of asset size and market capitalization on fund performance and the fund managers' ability to create value to the fund they manage is also addressed. The study finds that fund manager's exhibit poor stock-selection skills and does not seem to exhibit any distinguishable ability in timing.

Jarraya (2013) explained Markowitz work is seeking optimal allocation of wealth on a defined number of assets while minimizing risk and maximizing returns of expected portfolio. At the beginning, proposed models in this issue are resolved basing on quadratic programming. Unfortunately, the real state of financial markets makes these problems too complex.

Dangi (2013) presents a novel mechanism to reach to an optimal solution by encoding a variety of optimal solutions in a solution bank to guide the search process with regard to the global investment objective formulation. It conceptualizes the role of individual solver agents that contribute optimal solutions to a bank of solutions, and a super-agent solver that learns from the solution bank, and, thus reflects a knowledge-based computationally guided agents approach to investigate, analyse and reach to optimal solution for informed investment decisions.

Francesco et.al (2011) presented here a study of the Limited Asset Markowitz (LAM), of the Limited Asset Mean Absolute Deviation (LAMAD) and of the Limited Asset Conditional Value-at-Risk (LACVaR) models, where the assets are limited with the introduction of quantity and cardinality constraints.

Wanli (2011) explain the expert evaluation method, mean variance portfolio theory and quadratic programming, studies optimization of intellectual property venture portfolio, proves rationality and feasibility of the model through case analysis, and provides a theory for venture capital companies to optimize their investment portfolios.

Leon et.al. (2009) the main objective of this paper is to challenge the square-root-of-time rule as a proper volatility scaling method within the mean-variance framework, and to present a robust alternative.

Lean et.al. (2008) explained double-stage evolutionary algorithm is proposed for portfolio optimization. In the first stage, a genetic algorithm is used to identify good-quality assets in terms of asset ranking. In the second stage, investment allocation in the selected good-quality assets is optimized using another genetic algorithm based on Markowitz's theory.

Schumaker et.al. (2006) examines the role of financial news articles on three different textual representations; Bag of Words, Noun Phrases, and Named Entities and their ability to predict discrete number stock prices twenty minutes after an article release.

Chan et.al. (2002) presented a decision-making process that incorporates Genetic Algorithms into multi-stage portfolio optimization system. The objective function is to maximize one's economic utility or end-of-period wealth. The performance of our system is demonstrated by optimizing the allocation of cash and various stocks in Shenzhen market of China.

3. SUMMARY OF RECENT RESEARCH WORK

S. NO.	Year	Author(s)	Technique used	Application
1	2022	Ugur Tahsin Senel, Babak Daneshvar Rouyendegh, Sercan Demir	Analytic Hierarchical Process (AHP)	A multi-attribute approach to ranking departments based on performance
2	2021	J.V. Sai Prasanna Kumar	Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS)	Material Selection by using Ranking System
3	2021	Vineet Jain ,Mohd. Iqbal, and Ashok Kumar Madan	Preference Selection Index method for solving MCDM problem	Ranking of FMSFlexibility
4	2021	Jishu Jana and Sankar Kumar Roy	Hybrid Hesitant Fuzzy Ordered Weighted Aggregation-TOPSIS (HHFOWA-TOPSIS) and Linear Programming Problem(LPP)	Two-Person Game With Hesitant Fuzzy Payoff
5	2020	Jarosław Wątróbskia, Artur Karczmarczyk, Szymon Rymaszewski	AHP and TOPSIS	production line optimization
6	2019	Edmundas Kazimieras Zavadskas, Jurgita Antucheviciene and Prasenjit Chatterjee	MADM and MODM	Business Processes Information Management

7	2019	Mehdi RajabiAsadabadi, Elizabeth Chang & MortezaSaber	Analytic Hierarchy Process (AHP) and AnalyticNetwork Process (ANP)	A critical review of AHP and ANP
8	2013	Pankaj Gupta, Mukesh Kumar Mehlawat , Anand Saxena	Fuzzy-MCDM	Portfolio selection involving financial and ethical considerations
9	2013	Ángel García-Crespo , José Luis López-Cuadrado , Israel González-Carrasco , Ricardo Colomo-Palacios, Belén Ruiz-Mezcua	Semantics and fuzzy logic	Individual investment portfolio recommendations
10	2013	Pankaj Gupta , Masahiro Inuiguchi , Mukesh Kumar Mehlawat , Garima Mittal	Fuzzy goal programming and a hybrid intelligent algorithm	Expected value multi objective portfolio rebalancing
11	2013	Pankaj Gupta, Garima Mittal , Mukesh Kumar Mehlawat	Fuzzy goal programming and a hybrid intelligent algorithm	Expected value multi objective portfolio rebalancing
12	2012	J.D. Bermúdez, J.V.Segura, E.Vercher	multi-objective genetic algorithm	fuzzy portfolio selection

4. CONCLUSION

Portfolio optimization is the task of selecting assets such that the return on investment is maximized while the risk is minimized. For example, an investor may be interested in selecting five stocks from a list of 20 to ensure they make the most money possible. The Intelligent technique is being utilized by many financial institutions to select a set of stocks as a portfolio selection to maximize investors return and to minimized their risk. I read more than 40 research paper. In which we got knowledge about many techniques of MADM and MODM and their features. As AHP, TOPSIS, goal programming genetic algorithm etc. in this research paper I used MADM methods for portfolio ranking and MODM methods for stocks diversification in. After reviewing this article, the investors got high returns and low risk in their investment.

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A SURVEY ON MACHINE LEARNING BASED PREDICTIVE SYSTEMS FOR MENTAL HEALTH

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Mental illness like depression, schizophrenia, bipolar disorder has become wide spread in today's society. More than 7.5% of Indians suffer from some kind of mental disorder. It is very important to identify the symptom to predict mental disease status. In recent time different authors have applied different machine learning (ML) algorithms for the identification of critical symptoms and for prediction. In this research we have reviewed various research articles that applied the applications of classification and features selection algorithms for mental health diagnostic system. We have reviewed more than 40 papers that proposed mental health care diagnostics system by using machine learning methods. The outcome of this review encourages us to use the integration of feature selection and classification techniques for better result.

Keywords: Machine learning, feature selection, classification.

1. INTRODUCTION

Mental disorders are common in all countries, affect every community and age group, contribute substantially to the overall burden of disease and have major economic and social consequences and effects on human rights. However, the greatest inequities are cross national: 80% of people affected by mental disorder live in low income and middle income countries, which benefit from scarcely 10% of global mental health resource. Diagnostic categories and classification of mental disorders, which are essential to achieve objective of global mental health are needed for a range of stakeholders: for health – care practitioners to make treatment decisions and implement clinical guidelines; for policy makers to make decisions about allocation of resources; and for patients and their families to gain an understanding of their disorders.

Machine learning is a technique that aims to construct a system that can improve their experience by using advanced statistical and probabilistic techniques. It is believed to be a significantly useful tool to help in predicting mental health, allowing many researchers to acquire important information from the data, provide personalized experiences, develop automated intelligent systems. The widely used algorithm in the field of machine learning such as support vector machine, random forest and artificial neural networks have been utilized to forecast and categorize future events.

Autism spectrum disorder (ASD) is a complex developmental disorder that occurs in approximately 1 in 68 children (Centers for Disease Control and Prevention (CDC), 2014) and results in significant challenges with social skills, communication and behaviour (American Psychiatric Association, 2013). Individuals with ASD typically exhibit a number of stereotypical behaviours or interests including compulsions, echolalia and motor stereotypies such as hand flapping and body rocking as well as difficult behaviours such as self-harm, aggression and noncompliance. These maladaptive

behaviours are typically dealt with through multiple interventions of varying intensity, including speech- language therapy, occupational therapy, physical therapy and behavioural interventional. Many studies have demonstrated the effectiveness of these interventions at improving the outcomes for individuals with ASD, particularly if the interventions are intensive and introduced early in life.

2. REVIEW OF LITERATURE

In this paper, we have reviewed more than 20 number of research paper which are downloaded Elsevier, IEEE, Science direct websites, SCI generals and others reviews of these are follow:-

In this paper, we have reviewed more than 40 number of research paper which are downloaded Elsevier, IEEE, Science direct websites, SCI generals and others reviews of these are follow:-

Renjitet al.(2022) is proposed by the analytical process started with data purifying, lost values, probing interpretation, and finally the model is being built and evaluated . The best efficiency is on the public test set is a higher accuracy score will be found. This application can help to find the Prediction of mental health and future work for this project can be Connecting the mental health prediction with the cloud model. Optimizing the work to implement in an Artificial Intelligence environment.

Chung et al. (2022) in the paper of Mental illness is a health problem that undoubtedly impacts emotions, reasoning, and social interaction of a person.)ese issues have shown that mental illness gives serious consequences across societies and demands new strategies for prevention and intervention. Supervised learning in machine learning is the most widely applied approach in many types of research, studies, and experiments, especially in predicting illness in the medical field. In supervised learning, the terms, attributes, and values should be reflected in all data instances . More precisely, supervised learning is a classification technique using structured training data.

Sarkar et al. (2022) studied about Mental illnesses like depression, schizophrenia, bipolar disorder, etc. have become widespread in today's society. More than 7.5% of Indians suffer from some kind of mental disorder. Early detection of mental illness is important for treatment as well as to prevent self-harm. Traditionally, the diagnosis involved answering a specifically designed questionnaire at the doctor's clinic. In recent times Machine Learning (ML) algorithms have been successfully employed for the identification of critical symptoms, the development of diagnostic modules, and the personalization of therapy.

Ahmad et al. (2022) studies about Mental disorders are highly prevalent in the population and impact on the feelings or mood of affected people. The symptoms range from months to years in terms of duration, and also mild to be cured in terms of their severity. Since the mental illness is increasing at epidemic rates, it affects all aspects of life and people of all ages. It is noteworthy that the risk of mental disorder is increased with the unemployment, poverty, physical illness, and use of alcohol or drugs. According to a World Health Organization (WHO) report, about 450 million people are affected by mental disorders and placing the disease as a leading cause of health illness globally. Nowadays, artificial intelligence (AI) exhibited by machines helps computers to imitate human logic to solve problems. The researchers have developed many machine learning (ML) models to deal with a huge amount of information, and incomplete and, uncertain information. ML models can infer mental states by observing behaviors, and can predict depression, anxiety, stress, autism, as well as

the suicide risks. Many ML models such as Naïve Bayes (NB), Decision Tree (DT), Gradient Boosting Machine (GBM), k-Nearest Neighbor (kNN), Random Forest (RF), Support Vector Machine (SVM), and Neural Network (NN) are performing well in mental disease classification using text.

Xionget al. (2021) in this review he focused on the prediction of psychological anxiety disorders in youth. For these we propose a novel Bayesian neural network approach to address the anxiety disorder prediction problem the widely used algorithms in the field of machine learning such as support vector machine random forest artificial neural network have been utilized to forecast and categories the future events.

Zulfiker et al. (2021) used Among all the forms of psychological and mental disorders, depression is the most common form. Nowadays a large number of youths and adults around the world suffer from depression. Depression can cause severe problems in case of failing to detect it at an early stage or failing to ensure the timely counseling of a depressed person. It is one of the major reasons to raise suicidal cases. This study has investigated six different machine learning classifiers using various socio-demographic and psychosocial information to detect whether a person is depressed or not. Besides, three different feature selection methods, such as Select K-Best Features (SelectKBest), Minimum Redundancy and Maximum Relevance (mRMR), and Boruta feature selection algorithm have been used for extracting the most relevant features from the dataset.

Tao et al. (2021) is proposed by Several previous studies have applied learning algorithms to detect MDD symptoms on datasets containing patterns of behaviour among individuals, with the most common being. Support Vector Machine algorithm, Naive Bayes method and Random Forest technique. In their systematic review of ML techniques in the mental health domain, identified regression and Decision Trees (DT) as other common approaches used. Along with KNN, these methods comprise typical representative techniques in machine learning experiments. this research present a method that can assist in the preliminary screening of depressive cases in a large number of potential cases before formal clinical diagnosis. Further improve the classification performic and understanding about the relationship between features and depression. However there is still a lot of work that is not perfect and needs for the discussion and research.

Seery et al. (2021) used in Recent debates about the classification of mental illness have proposed replacing traditional categorical diagnostic systems with a psychological formulation model. While competing approaches are typically appraised in terms of scientific validity or clinical utility, it is also important to consider their implications for lay attitudes to mental illness. The DSM-5 operates from a medical model of mental health (Deacon, 2013), while the PTM framework aims to move away from the medical “mind-set” (Johnstone & Boyle, 2018). As such, findings that participants in the diagnosis condition perceived medical care as more helpful are consistent with the aims of both the DSM and PTM framework. These results have a number of implications.

Wang et al. (2021) For the purpose of improving the accuracy of mental health prediction, machine learning technology has been used in the mental health prediction research since the 1980s. proposed a depth-first search method according to reverse search strategy in 1996, which is used to diagnose depression or dementia. developed an expert system based on the subjects’ behavior, cognition, symptoms of emotion, and neuropsychological assessment results. Gil. and Manuel (30) come up

with a system according to Artificial Neural Network (ANN) and Support Vector Machine (SVM) in 2009, which is used to diagnose Parkinson's disease. The system improves the accuracy of diagnosis and reduces the cost of diagnosis. come up with a model called Bayesian Network (BN) in 2014, which is used to diagnose dementia and Alzheimer disease.

Senior et al. (2021) There has been a rapid growth in the publication of new prediction models relevant to child and adolescent mental health. However, before their implementation into clinical services, it is necessary to appraise the quality of their methods and reporting. We conducted a systematic review of new prediction models in child and adolescent mental health, and examined their development and validation. Quality of reporting was assessed using the Transparent Reporting of a multivariable prediction models for Individual Prognosis Or Diagnosis checklist, and quality of methodology using items based on expert guidance and the PROBAST tool.

Shrivastava et al. (2021) in this review Mental health is the aggregation of emotional, social and psychological well-being of a person. It affects on the person's thinking, acting and feeling capability. Mental health is a measure of handling stress and decision making with every step in life. There is enough data available that we are now able to compile data for mental health professionals so they may do their job efficiently. Machine learning classification algorithms will help in determining key behavioural biomarkers to help mental state professionals choose if a patient is in peril of developing a selected mental state disorder. Algorithms may assist in tracking effectiveness and better of a treatment plan. This paper reviews about the appliance of ML to psychological state prediction, which incorporates a variety of advantages across the areas of diagnosis, treatment and support, research, and clinical administration. With the bulk of studies identified that specialize in the detection and diagnosis of psychological state conditions.

Ćosić et al. (2020) The proposed methodology for prediction of mental health disorders among HCWs during the ongoing pandemic based on AI-aided data analysis is particularly important since they are a high-risk group for contracting the COVID-19 disease (68) and developing later stress-related symptoms. However, the methodology proposed in this article might be applied generally for all those who were exposed to higher levels of such risks during the COVID-19 pandemic. The main objective of the proposed methodology is to expand subjective metrics as predictors of potential mental health disorders mainly specific for Phase 2 with more objective metrics derived in Phases 1, 3, and 4. The use of neuro-physiological features is expected to provide additional information and increase reliability when identifying particularly at-high-risk individuals. Such efforts are well aligned with the growing literature regarding the application of AI methods in prediction of chronic mental health disorders, which has been initially focused mainly on self-report predictor variables

Su et al. (2020) proposed that Recent years have witnessed the increasing use of DL algorithms in healthcare and medicine. In this study, we reviewed existing studies on DL applications to study mental health outcomes. All the results available in the literature reviewed in this work illustrate the applicability and promise of DL in improving the diagnosis and treatment of patients with mental health conditions. Also, this review highlights multiple existing challenges in making DL algorithms clinically actionable for routine care, as well as promising future directions in this field.

Tate et al. (2020) worked on the Ultimately, our top performing model would not be suitable for clinical use, however it lays important groundwork for future models seeking to predict general

mental health outcomes. Future studies should make use of parent-rated assessments when possible. Specifically, impulsivity has been associated with a susceptibility of developing mental illnesses and suicide. Moreover, neurodevelopmental disorders, such as autism or ADHD, indicate lifelong diagnosis and frequent psychiatric comorbidities

Salicru (2020) This article offers a transdiagnostic framework for the prevention and treatment of mental health by reducing early psychopathology. The framework supports the contention that the time has come to retire dominant categorical classification systems of mental disorders (e.g. DSM and ICD), and the current prevailing biomedical model of mental illness by moving to a psychosocial model of psychopathology. This entails reclaiming and integrating the long-standing legacy of psychology with recent advances in neuroscience and related disciplines. To this end, this conceptual paper synthesizes and integrates the extant literature and empirical findings, takes a scientist-practitioner stance, and draws on recent developments in transdiagnostic approaches to mental health, psychotherapy integration and advances in modern attachment theory.

THIEME et al. (2020) Recent years have witnessed an increase in excitement and exploratory research on potential applications of ML for mental health. Our review has offered an overview of this area of research and highlighted current trends and challenges. Aiming to shape the future direction of work, we have discussed current approaches and potential steps toward achieving ML systems that are effective and implementable for mental health care. Finally, we argued that helping the field achieve its many ambitious visions for ML in mental health requires continued efforts in conducting basic, multi-disciplinary research in deep collaboration with health partners, developing and testing new ML-interventions, and studying their effectiveness within real-world use contexts.

Blessie et al. (2019) Encouraging mental health and preventing mental disorders are one of the important areas to reduce the impact of behavioral health conditions in the world. The main objective of proposed research is to develop an intelligent mental disorder diagnosis and prediction system using various classifiers namely NB and KNN. Today's health care is difficult to imagine without the possibility to objectively measure various physiological parameters related to patients' symptoms.

Ernala et al. (2019) A growing body of research is combining social media data with machine learning to predict mental health states of individuals. An implication of this research lies in informing evidence-based diagnosis and treatment. However, obtaining clinically valid diagnostic information from sensitive patient populations is challenging. In this line of research, on the methodological front, supervised machine learning techniques have gained prominence, providing promising predictive outcomes of mental health states. The success of these techniques, however, hinges on access to ample and high-quality gold standard labels for model training.

Koninga et al. (2019) We carried out a population-based cohort study based on readily available routine healthcare data anonymously extracted from electronic medical records of 76 general practice centers in the Leiden area, the Netherlands. We included all patients aged 1–19 years on 31 December 2016 without prior mental health problems. Multilevel logistic regression analyses were used to predict the one-year risk of a first recorded mental health problem. Potential predictors were characteristics related to the child, family and healthcare use. Model performance was assessed by examining measures of discrimination and calibration.

Pendse et al. (2019) As a leading and growing cause of worldwide disease burden, untreated mental illness can be devastating, with 14.3% percent of deaths worldwide attributable to a form of such illness . The experience of having a mental illness is unique and complex, and shaped by a

confluence of biological, psychological, and social factors. Considering that the causes of mental illness are numerous and come from biological, social, and environmental factors, it is still an open question of what specific actions could be taken if a large amount of participants in a study unrelated to mental health are presenting symptoms of mental illness. Explorations of these questions in the future could make the link between HCI4D and mental health much deeper, and give researchers and practitioners the opportunity to make progress in an under-covered and important area.

Graham et al. (2019) Artificial intelligence (AI) technology holds both great promise to transform mental healthcare and potential pitfalls. This article provides an overview of AI and current applications in healthcare, a review of recent original research on AI specific to mental health, and a discussion of how AI can supplement clinical practice while considering its current limitations, areas needing additional research, and ethical implications regarding AI technology. As AI techniques continue to be refined and improved, it will be possible to help mental health practitioners re-define mental illnesses more objectively than currently done in the DSM-5, identify these illnesses at an earlier or prodromal stage when interventions may be more effective, and personalize treatments based on an individual's unique characteristics. However, caution is necessary in order to avoid over-interpreting preliminary results, and more work is required to bridge the gap between AI in mental health research and clinical care.

Singh et al.(2018) proposed by the Given the increased interest in machine learning approaches today, there are many approaches based on combining models. One specific method of doing so, cascading, appears to be relatively rarely used, although in earlier applications of pattern/image recognition, this showed significant potential. Motivated by an important healthcare application, in this work, we show the potential of using cascading models for predicting the severity of patient cases.

Winz et al. (2018) Despite the limitations, the evidence suggests long-term effect sustainability for mental ill health preventive interventions, in particular, for interventions to reduce the symptoms of depression and symptoms of anxiety. A systematic search in MEDLINE, PsycInfo, ERIC, and Scopus was performed for RCTs published in 1995–2015 reporting an assessment of mental ill health and positive mental health outcomes for, at least, three months of post-intervention follow-up.

Caspin et al. (2018) used in Mental disorders are pervasive in the population; they do not breed true across generations in families; they show little causal specificity; and they do not simply go away, instead often morphing with time into other, different conditions. Indeed, people who experience one condition often experience other co- and future-occurring conditions. Other efforts to rethink classification in psychiatry (e.g., RDoC) are eschewing the existing diagnostic system and studying multiple constructs (e.g., cognitive control, fear, arousal) in hopes of achieving a new diagnostic system.

Cho et al. (2018) they used hanced technology in computer and internet has driven scale and quality of data to be improved in various areas including healthcare sectors. Machine Learning (ML) has played a pivotal role in efficiently analyzing those big data, but a general misunderstanding of ML algorithms still exists in applying them (e.g., ML techniques can settle a problem of small sample size, or deep learning is the ML algorithm). This paper reviewed the research of diagnosing mental illness using ML algorithm and suggests how ML techniques can be employed and worked in

practice. Researches about mental illness diagnostic using ML techniques were carefully reviewed. Five traditional ML algorithms-Support Vector Machines (SVM), Gradient Boosting Machine (GBM), Random Forest, Naïve Bayes, and K-Nearest Neighborhood (KNN)-frequently used for mental health area researches were systematically organized.

Ohrnbergeraet al. (2017) There is a strong link between mental health and physical health, but little is known about the pathways from one to the other. We analyse the direct and indirect effects of past mental health on present physical health and past physical health on present mental health using lifestyle choices and social capital in a mediation framework. We use data on 10,693 individuals aged 50 years and over from six waves (2002–2012) of the English Longitudinal Study of Ageing. Mental health is measured by the Centre for Epidemiological Studies Depression Scale (CES) and physical health by the Activities of Daily Living (ADL).

Sumathi et al. (2017) they used the Ensemble of Naïve Bayes classifier was constructed with fuzzy clustering of full feature set and reduced feature set. Two techniques, majority voting and weighted average were applied on the predictions of individual classifiers. The final predictions made by the classifier are evaluated with test data set. Using the confusion matrix values, the sensitivity, specificity, kappa values and balanced accuracy were calculated using the formula given in previous section.

Jiang et al. (2017) We reviewed the motivation of using AI in healthcare, presented the various healthcare data that AI has analysed and surveyed the major disease types that AI has been deployed. We then discussed in details the two major categories of AI devices: ML and NLP. For ML, we focused on the two most popular classical techniques: SVM and neural network, as well as the modern deep learning technique. We then surveyed the three major categories of AI applications in stroke care. A successful AI system must possess the ML component data) and the NLP component for mining unstructured texts. The sophisticated algorithms then need to be trained through healthcare data before the system can assist physicians with disease diagnosis and treatment suggestions. The IBM Watson system is a pioneer in this field. The system includes both ML and NLP modules, and has made promising progress in oncology. For example, in a cancer research, 99% of the treatment recommendations from Watson are coherent with the physician decisions.

Clark et al. (2017) At the outset of this article, we said that we would extract from our deliberations a set of considerations intended to facilitate the related goals of improving classification of mental illness, advancing clinicians' ability to identify and treat the diverse manifestations of psychopathology, and deepening knowledge of how mental disorders develop, are maintained, and can be ameliorated. The more specified criterion-based approach of DSM and the less specified diagnostic-guidelines approach of ICD each have strengths and weaknesses with regard to reflecting comorbidity data.

Wongkoblapp et al. (2017) the purpose of this review was to explore the scope and limits of cutting-edge techniques that researchers are using for predictive analytics in mental health and to review associated issues, such as ethical concerns, in this area of research. this review was to provide an overview of the state-of-the-art in research on machine learning techniques.

Davis et al. (2016) The current evidence partly answered our questions. There was wide variation in the quality of source data, with a risk of publication bias. For some diagnoses, especially psychotic

categories, administrative data were generally predictive of true diagnosis. Studies were included if they were a peer-reviewed published comparison of psychiatric diagnoses in routinely recorded data against reference standard diagnoses using ICD, DSM or similar psychiatric classification systems. The studies included samples of patients recruited from population, primary or secondary care settings; however, the diagnoses under study were those derived from secondary care only - either inpatient or outpatient psychiatric services.

Sumathi et al. (2016) use a number of expert systems are utilized in medical domain to predict diseases accurately at an early stage so that treatment can be made effectively and efficiently. As a number of machine learning techniques are available to construct expert systems, it is necessary to compare them and identify the best that suits the domain of interest. The research has compared eight machine learning techniques (classifiers) on classifying the dataset to different mental health problems. It is evident from the results that the three classifiers viz., Multilayer Perceptron, Multiclass Classifier and LAD Tree produce more accurate results than the others. The data set is very minimal and in future, the research may be applied for a large data set to obtain more accuracy.

Pedrelli et al. (2015) studies about several types of Autism spectrum disorders (ASDs) include a group of related complex and chronic neurodevelopment disorders, which are generally characterized by a variable presentation of problems with socialization, communication, and behavior. Although ASDs are typically considered very disabling, a number of young people with ASDs do not have cooccurring intellectual impairment or language speech impairment (i.e., high functioning autism spectrum disorder and Asperger's disorder) and are able to attend college. Interestingly, a sample of 667 college students at a single university was used to diagnostically and dimensionally assess the rate of high functioning ASD in college populations. The study found that depending upon the ascertainment method between 0.7 and 1.9 % of college students could meet the criteria for high-functioning ASD. Although the severity of ASD may decline during the adult period, individuals continue to have poor social functioning and often continue to require services.

Blakemore et al. (2014) studies the Anxiety and depression predict HRQoL in COPD. However, this longitudinal analysis does not show cause and effect relationships between depression and anxiety and future HRQoL. Future studies should identify psychological predictors of poor HRQoL in well designed prospective cohorts with a view to isolating the mediating role played by anxiety disorder and depression. The main aim of this review was to assess the strength of the longitudinal association between anxiety, depression, and HRQoL in COPD. Where these data were not available in the published papers, authors were contacted by email or letter to request the appropriate data. Where the length of follow-up varied, data were extracted and included in the meta-analysis for the time point closest to 12 months after the baseline measures were taken.

Cuthbert et al (2013) worked on Current diagnostic systems for mental disorders rely upon presenting signs and symptoms, with the result that current definitions do not adequately reflect relevant neurobiological and behavioural systems - impeding not only research on etiology and pathophysiology but also the development of new treatments. Future diagnostic systems cannot reflect ongoing advances in genetics, neuroscience and cognitive science until a literature organized around these disciplines is available to inform the revision efforts. The goal of the RDoC project is to provide a framework for research to transform the approach to the nosology of mental disorders.

Verdun-Jones et al. (2013) many studies have identified an apparent link between mental illness and both violence and recidivism, other research has found that serious mental illness (primarily schizophrenia and other psychoses) alone is not significantly predictive of criminal behaviour. The more important factors are antisocial personality, psychopathy, neuro-cognitive brain impairments and substance abuse, as well as having antisocial associates and living in a chaotic and antisocial environment with few positive social supports. The issue is confused by the use of the term “mental illness” sometimes to mean only the serious psychotic disorders, including schizophrenia, and at other times to include all of the various conditions listed in the DSM-IV2, including antisocial personality disorder and substance abuse.

Bahnet al. (2013) studied about the challenges and recent successes associated with the discovery and development of blood-based biomarkers for psychiatric disorders. currently used diagnostic classification systems for psychiatric disorders, such as the Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV)¹ and the International Classification of Disease 10 (ICD-10; <http://www.who.int/classifications/icd/en/>), are known to have shortcomings. However, the regulatory health authorities now consider the identification, validation and implementation of biomarkers to be of critical importance for the future drug discovery.

Coghillet al. (2011) In this review, we have explored contemporary aspects to the category/dimension debate within the fields of child and adolescent mental health and developmental psychology. The application of modern analytic techniques, especially taxometric approaches, has made it clear that there is no simple or overall resolution to this debate from an empirical point of view. Both categorical and dimensional solutions appear to have a value and this varies from disorder to disorder. Whilst some disorders, such as melancholic/endogenous depression and mixed anxiety and depression disorder, appear to be associated with discrete taxa others, such as ADHD, PTSD, nonmelancholic depression, and psychopathy, do not. In other cases such as schizotypy, the taxa appear to identify a high risk group rather than the disorder per se.

Aarons (2008) The present work extends the research on the relationship between mental and physical health problems to adolescents served in the public sector, who are at especially high risk for behavioural and emotional problems. The computer assisted version of the Diagnostic Interview Schedule for Children - IV (C-DISC-IV) [26] was administered to parents and youth during the baseline interview by lay interviewers trained on the instrument by a member of the NIMH DISC Editorial Board (AG). The DISC-IV is a highly structured diagnostic interview designed to yield DSM-IV based diagnoses through computer algorithm scoring. The DISC has demonstrated reliability and validity comparable to that of other diagnostic measures.

Slade et al. (2007) studied about A national face-to-face household survey of 8841 (60% response rate) community residents aged between 16 and 85 years was carried out using the World Mental Health Survey Initiative version of the Composite International Diagnostic Interview. Diagnoses were made according to ICD-10. Key findings include the prevalence of mental disorder, sex and age distributions of mental disorders, severity of mental disorders, comorbidity among mental disorders, and the extent of disability and health service use associated with mental disorders.

3. SUMMARY OF REVIEWS

We have identified from different lecture review that different classification and feature selection

techniques are applied for effective prediction. The purpose of this research is to put together the 7 most common types of classification algorithms along with the python/Matlab code: Logistic Regression, Naïve Bayes, Stochastic Gradient Descent, K- Nearest Neighbours, Decision tree, Random Forest, Support Vector Machine.

Year	Authors	Methods	Out Come
2022	Renjit et al.	Optimization	This application can help to find the Prediction of mental health and future work
2022	Chung et al.	Classification	Demands new strategies for prevention and intervention
2022	Sarkar et al.	Machine Learning	The development of diagnostic modules, and the personalization of therapy.
2022	Ahmad et al.	ML models such as Naïve Bayes (NB), Decision Tree (DT), Gradient Boosting Machine (GBM), k-Nearest Neighbor (kNN), Random Forest (RF), Support Vector Machine (SVM), and Neural Network (NN)	Nowadays, artificial intelligence (AI) exhibited by machines helps computers to imitate human logic to solve problems.
2021	Xionget al.	machine learning such as support vector machine random forest artificial neural network	the anxiety disorder prediction problem the widely used algorithms
2021	Zulfiker et al.	K-Best Features (SelectKBest), Minimum Redundancy and Maximum Relevance (mRMR),	socio-demographic and psychosocial information to detect whether a person is depressed or not.
2021	Tao et al.	ML techniques in the mental health domain, identified regression and Decision Trees (DT) as other common approaches used. Along with KNN	still a lot of work that is not perfect and needs for the discussion
2021	Seeryet al.	DSM and PTM	appraised in terms of scientific validity or clinical utility
2021	Wanget al.	Artificial Neural Network (ANN) and Support Vector Machine (SVM)	improving the accuracy of mental health prediction
2021	Shrivastava et al.	Machine learning classification algorithms	a measure of handling stress and decision making with every step in life.
2020	Ćosić et al.	AI	neuro-physiological features is expected to provide additional information and increase reliability when identifying particularly at-high-risk individuals.
2020	Su et al.	DL	future directions in this

			field
2020	THIEME et al.	ML	developing and testing new
2019	Blessie et al.	NB and KNN	important areas to reduce the impact of behavioral health conditions in the world
2019	Graham et al.	AI	great promise to transform mental healthcare and potential pitfalls
2018	Cho et al.	ML algorithms-Support Vector Machines (SVM), Gradient Boosting Machine (GBM), Random Forest, Naïve Bayes, and K-Nearest Neighborhood (KNN)	quality of data to be improved in various areas including healthcare sectors
2017	Jiang et al.	ML and NLP. For ML, we focused on the two most popular classical techniques: SVM and neural network	The IBM Watson system is a pioneer in this field
2017	Clark et al.	DSM	strengths and weaknesses with regard to reflecting comorbidity data
2016	Davis et al.	ICD, DSM	however, the diagnoses under study were those derived from secondary care only - either inpatient or outpatient psychiatric services.
2015	Pedrelli et al.	ASD	that depending upon the ascertainment method between 0.7 and 1.9 % of college students could meet the criteria for high-functioning

4. Conclusion

In this work, we focused on the predictions of psychological anxiety disorders in youth. Although automated online systems have been developed, their accuracy may not be sufficiently high to warrant clinical translation. To improve the predictive accuracy, we proposed and evaluated FE-BNN, a Feature Ensemble based Bayesian Neural Network. We evaluated FE-BNN on three disorder-specific datasets collected by the online YODA tool and benchmarked it against a collection of machine learning methods and the original scoring function of YODA. The obtained results clearly demonstrate the superiority of FE-BNN over the evaluated methods, not requiring the involvement of clinical psychologists. In the future, we primarily intend to investigate how the proposed.

Ensemble approach can be made more interpretable and explainable, so that it can highlight the key features and questions affecting the attained outcome. Clinicians will directly benefit from such an explain ability, as this can practically save time and increase the transparency of machine learning methods deployed for clinical decision-support in mental health applications.

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A STUDY ON THE USE OF MACHINE LEARNING APPROACH TO FORECAST STOCK PRICES

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Every day, market factors (direct or indirect) affect stock prices (buy and sell). One of the biggest concerns in recent years has been the forecast of stock prices. Investors make stock market investments based on predictions. Investors in the stock market use a variety of strategies and tactics for price prediction in order to maximise their earnings and reduce their risks. Stock price predictions frequently involve machine learning techniques. This review paper addresses several machine learning techniques (supervised and unsupervised) and ways for investors to learn whether stock values are rising or falling. Data acquisition, dataset pre-processing, feature extraction, feature-based stock price prediction, and result presentation were the five stages of the procedure. Historical data is initially gathered from various financial sites. Pre-processing is the second step, when inaccurate, duplicate, and junk data are removed. In the third step, data sets are reduced and meaningful data are chosen. In the fourth step, predictions are made utilising various machine learning methods, including supervised and unsupervised learning techniques. In the end, many methods are analysed in the final step to determine correctness.

Keywords - Stock Price Prediction, Stock Forecasting, Machine Learning Techniques, Feature Extraction.

1. INTRODUCTION

The stock market provides a glimpse of the economies and companies expected future growth. Stock price fluctuations are caused by a variety of reasons, including macroeconomic circumstances, market expectations, and belief in the leadership and operations of the company, among others. The public can now get more information more quickly thanks to technological advancements. Because a significant amount of data needs to be analysed quickly, stock analysis has become increasingly challenging. According to studies just 10% of people worldwide, accept the risk of investing in the stock market, which is highly difficult to do due to its dynamic, non-stationary, noisy, and non-parametric nature(Sharma et al., 2017). International & domestic issues i.e. political, the financial and economic crises, and numerous other market factors can all affect stock prices. Daily stock price adjustments are made by market forces. The forces of supply and demand cause fluctuations in stock prices(Shah et al., 2019). Due to supply and demand, stock prices change. When there is greater demand (buyers) than there are sellers of a stock, the price of that stock rises (supply). If there were more buyers than sellers of a stock, the price of the stock would fall as a result. Figure 1 (Choudhary, 2019) illustrates influence of price valuations on stock's price.

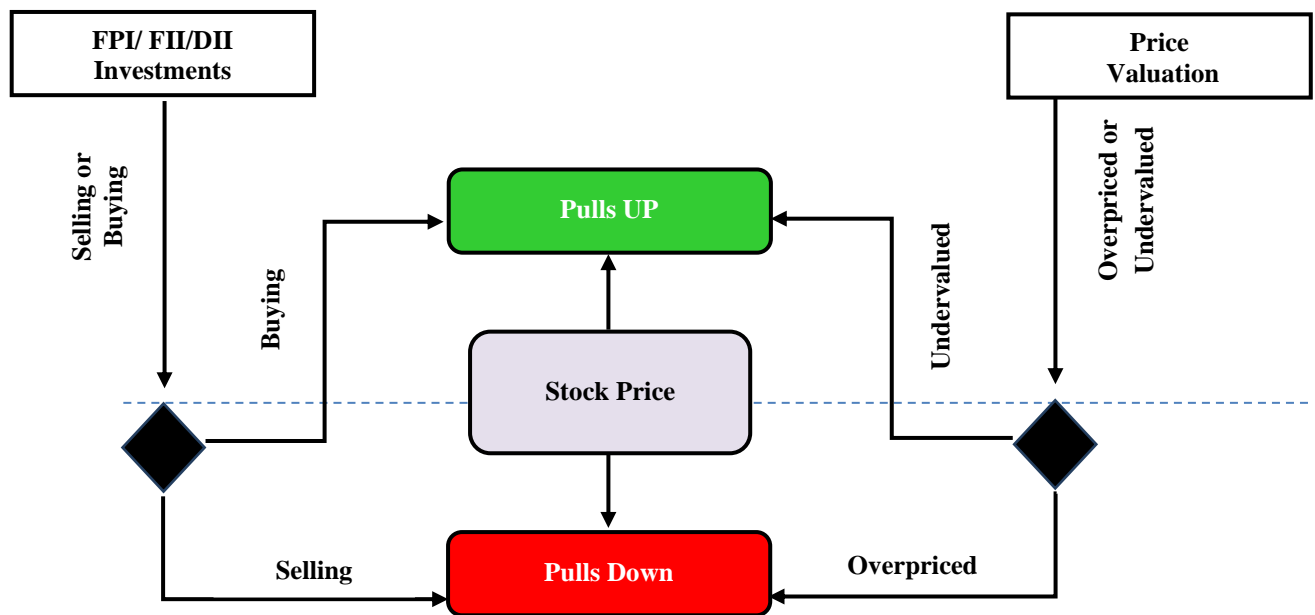


Figure 1: Stock Prediction (Rise or Fall)

Several researchers are continuously attempting to develop an effective, affordable, and workable model that will help investors, newbies, and shareholders make better decisions on where to hold or invest their stock in order to optimise profits while minimising risk. Stock's technical and fundamental analysis are used for stock price prediction. Technical analysis examines historical stock prices in order to predict future stock values. Fundamental analysis, on the other hand, typically deals with unstructured datasets like financial news and economic statistics. Most researches came to the conclusion that both structured and unstructured data sets are utilised in order to get better results or accuracy. In order to forecast stock prices, a variety of machine learning techniques are applied, including Naive Bayesian, Support Vector Machine, K-Nearest Neighbour, Artificial Neural Networks, Random Forest, and the Neural Network (NN) and Deep Neural Network algorithms (DNN). The major goal of this study is to give a comprehensive examination of several stock market forecasting approaches to estimate next trends and stock market performance. The majority of the stock market prediction methods and methodologies used in recent research papers are explained in this paper. Figure 2 provides an overview of how the stock price was projected by sentiments based on direct/ indirect factors & historical price data(Patel et al., 2021).

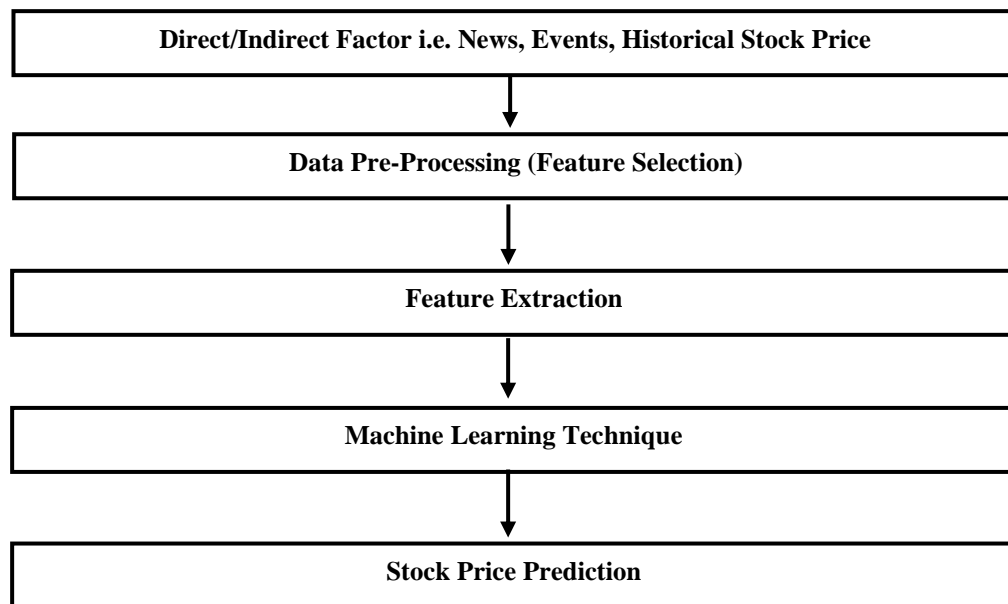


Figure 2: Typical flow of Stock Price Prediction

2. LITERATURE REVIEW

In the last few years, many researchers have used various types of machine learning techniques and methods for prediction of stock prices in the stock market, out of which we are presenting some specific research work here.

Awad et al. (2009) presented a new method for prediction of time series data using radial basis functions. This approach is based on a new efficient method of clustering of the centers of the radial basis function neural network; it uses the error committed in every cluster using the real output of the radial basis function neural network trying to concentrate more clusters in those input regions where the error is bigger and move the clusters instead of just the input values of the I/O data. This method of clustering, improves the performance of the time series prediction system obtained, compared with other methods derived from traditional algorithms

Lee et al. (2009) have developed a prediction model based on support vector machine (SVM) with a hybrid feature selection method to predict the trend of stock markets. This proposed hybrid feature selection method, named F-score and Supported Sequential Forward Search (F_SSFS), combines the advantages of filter methods and wrapper methods to select the optimal feature subset from original feature set. experimental results show that the proposed SVM-based model combined with F_SSFS has the highest level of accuracies and generalization performance in comparison with the other three feature selection methods.

Devadoss et al. (2013) considered that ANN (Artificial Neural Network) was a highly versatile, non-linear approach to forecasting stock prices for BSE-related companies (Bombay Stock Exchange). In this model, the author uses the opening price, high, low, closing price, and stock volume as a dataset. According to the author, if we want to increase the accuracy rather than increase the number of inputs, because the author observed that the error in the model was high when they took three inputs

for prediction, and it was minimized when the five inputs and the accuracy of the predictions were higher.

Authors (Niu et al., 2014) introduce a random data-time effective Radial Basis Function Neural Network (RBFN) in determination of the output weights, the center vectors and the widths in the hidden layer of the network and applied to different financial time series data. In this work authors also employ the Gradient Descent (GD) optimization algorithm and result shows that RBF neural network has the advantage of improving the precision of forecasting.

Kalyanaraman et al. (2014) This paper presents a sentiment analysis on news articles to see the impact on stock prices. Dataset was from the Bing API. There is a specialized sentiment dictionary intended solely for the study of stock papers. Two separate machine learning algorithms were used for the data set and the performance of the two was compared. There is a comparison of the projected effects with the real shift in stock prices.

Li et al. (2014) have introduced a systematic system for predicting stock price by developing the sentiment dimensions using the Loughran-McDonald financial sentiment vocabulary and the Harvard psychological dictionary. In this study, experiments are conducted using news stories and prices from the Hong Kong Stock Exchange during a five-year period. The results show that (1) Models with sentiment analysis outperform the bag-of-words model at the individual stock, sector and index levels. (2) Models using sentiment polarity cannot make useful predictions. (3) there is a small difference between models using two separate sentiment dictionaries.

Bhardwaj et al. (2015) have proposed a system is to fetch live server data by using Python programming language, which can be used for performing sentiment analysis on the extracted datasets from online news portal.

The comparison of Autoregressive integrated moving average (ARIMA) and RBFN is done by authors (Haviluddin et al., 2015) and result demonstrates that the proposed RBFNN is more competent in modelling and forecasting time series than an ARIMA model.

Akita et al. (2016) proposed Deep Learning Models and LSTM for prediction of stock prices. Authors' approach predicts stock prices by using Regression for textual information and LSTM for numerical information. Paper results have shown that the distributed representation of text data is better than the numerical data and Bag-of-Words based methods, LSTM was effective for time series data impacts than other models.

Khatri et al. (2016) analysed sentiment evaluation using data taken from Twitter and the opinions received from Yahoo and created an artificial neural network with performance and market prices to estimate the return on investment for the five biggest I.T. companies in the future.

Khedr et al. (2017) stated the stock market is seen as a treasure of investment information. In this model, the authors use two types of news content: market relevant news, business news and financial report written by financial analysts on stocks. Author's first stage analysis, news statement to get the text polarity by using Naive Bayes and obtains 72.82% accuracy. In second stage, author uses both datasets news and historical stock data to forecast the stock prices using a K-NN algorithm and obtains 89% accuracy. Author says this model achieved the highest accuracy compared to other

previous models, This model predict the future stock market trend and obtained accuracy up to 89.80%.

Bharathi et al. (2017) have proposed a stock prediction system that uses sentiment analysis and combined two datasets—Really Simple Syndication [RSS] news feeds and sensex points of ARBK from the Amman Stock Exchange. There has been a significant improvement in prediction precision of 14.43 percent as a result of the experimental output. Compared to the regular ID3, C4.5 algorithm.

Zhang et al. (2018) proposed a new stock market trend prediction method that can forecast financial performance as well as its interval of increase (or decrease) rate within predefined forecasting periods. According to this paper, the model uses a heuristic algorithm (unsupervised) to split raw user information from each stock into multiple clips of predetermined duration and classify them into four categories Up, Down, Flat, and Unknown. This proposed model outperforms some existing techniques

Batra et al. (2018) considered SVM models for stock prediction because they can handle large feature spaces and are also effective for text categorization. Authors uses two dataset tweets related to Apple products and market index data from Yahoo Finance. The results of the proposed work are 75.22 percent accuracy of the training and 76.68 percent accuracy of the test. According to the authors, this work needs to improve the accuracy of the text classification test and the accuracy of the prediction if the size of the dataset is increased.

Alkubaisi et al. (2018) have focused on the prediction classification Model using Twitter Sentiment based on the HNBC (Hybrid Naive Bayes Classifiers). The authors divided their work into five phases – data collection (Twitter API), filtration and transformation (to obtain the relevant data), labelling (In which data polarity is specified and negative, positive or neutral values are assigned to the opinion of the individual concerned), classification (acceptable stock market patterns are established by the hybridization of Bayies Classifiers) and last one is performance and evaluation. The proposed work achieved accuracy = 90.38%.

Shahet al. (2019) focused on some of the stock market forecasting research achievements and discussed some of the forecasting methods and technical, fundamental, short- term, long-term approaches that help predict stock prices. According to the author, a combination of statistical and machine learning techniques is likely to be more useful for stock prediction, The authors note that the market acts as a weighting machine with less noise and more predictability in the long run.

Mate et al. (2019) assumed that stock prediction and financial news are interlinked to each other. In this paper, two types of data are gathered which are stock indices and news data from the NY Times Archive API. The Natural Language Toolkit package in python is most commonly used for sentiment analysis to identify emotions or actions by natural language processing. If the news is positive, then we can state that this news effect is good on the stock, so that more chances of stock prices are high. And if the news were bad, it might have an effect on the stock price to go down. Output of sentiment analysis is fed into the machine learning model to forecast stock prices.

Authors (Henrique et al., 2019) review various ML techniques and give overview about the most-cited articles, those with the greatest bibliometric coupling and the highest co-citation frequencies,

the most recently published articles and provided exploration of the behavior of forecasting in development of market.

Mohan et al. (2019) have developed forecast models based on time series prediction models such as ARIMA, RNN, and Facebook Prophet. This paper forecasts stock prices using time series models and a mixture of neural networks and news posts. The dataset in this paper contains Regular prices of stock for S&P500 companies over five years, along with news articles linked to these businesses. Authors have achieved better results with RN.

Authors (Lee et al., 2019) examine the effect and usefulness of network indicators for determining strategies via several ML techniques like Logistic Regression, Support Vector Machine, And Random Forest. ML techniques such as LR, RF, and SVM were used for the prediction of the global financial market. The results of the study showed that the global stock market network indicators are effective for forecasting market direction (up and down) during the market turmoil period as expected.

Selvamuthu et al. (2019) have compared three algorithms, i.e., Levenberg-Marquardt (LM), Scaled Conjugate Gradient (SCG) and Bayesian Regularization (BR). All three algorithms provide an accuracy of 99.9% using tick data. The accuracy over 15-min dataset drops to 96.2%, 97.0% and 98.9% for LM, SCG and Bayesian Regularization respectively which is significantly poor in comparison with that of results obtained using tick data.

Ding et al. (2020) have proposed an associated deep recurrent neural network model with multiple inputs and multiple outputs based on long short-term memory network. The associated network model can predict the opening price, the lowest price and the highest price of a stock simultaneously. The associated network model was compared with LSTM network model and deep recurrent neural network model. The experiments show that the accuracy of the associated model is superior to the other two models in predicting multiple values at the same time, and its prediction accuracy is over 95%.

Guo et al. (2020) have proposed model is not an independent online algorithm but may be regarded as an accelerator for other online SVM learning algorithms, and it constructs working set of SVM by a fixed-size window with the samples which violate the KKT conditions. Comprehensive experiments clearly show that the proposed model can accelerate the online learning process effectively and has good robustness and generalization performance.

Jin et al. (2020) have proposed a deep learning-based stock market prediction model that considers investors' emotional tendency. First, they proposed to involve investors' sentiment for stock prediction, which can effectively improve the model prediction accuracy. Second, the stock pricing sequence is a complex time sequence with different scales of fluctuations, making the accurate prediction very challenging. They proposed to gradually decompose the complex sequence of stock price by adopting empirical modal decomposition (EMD), which yields better prediction accuracy. Third, they adopt LSTM due to its advantages of analyzing relationships among timeseries data through its memory function. Experiment results show that the revised LSTM model can not only improve prediction accuracy, but also reduce time delay.

Kumar et al. (2020) have presented a workload forecasting framework based on neural network model with supervised learning technique. An improved and adaptive differential evolution algorithm is developed to improve the learning efficiency of predictive model. The results are compared with state-of-the-art methods, and improvements up to 91%, 97% and 97.2% are observed over self-adaptive differential evolution,

backpropagation and average-based workload prediction techniques, respectively.

Reddy et al. (2020) stated that utilising the power of machine learning for stock prediction requires a low-cost, effective model to forecast stock price using sentiment analysis on social media data. The smallest gap between the model's anticipated value and the stock price as it is now being traded should be the main focus. SVM, LSTM, KNN, and LINEAR REGRESSION are just a few of the significant stock prediction approaches the author highlighted.

Dash et al. (2021) proposed a new machine learning (ML) technique that uses the fine-tuned version of support vector regression for stock forecasting of time series data. Grid search technique is applied over training dataset to select the best kernel function and to optimize its parameters. The optimized parameters are validated through validation dataset. Thus, the tuning of this parameters to their optimized value not only increases model's overall accuracy but also requires less time and memory.

Haq et al (2021) have combined features selected by multiple feature selection techniques to generate an optimal feature subset and then use a deep generative model to predict future price movements. The results demonstrate that combining features selected by multiple feature selection approaches and using them as input into a deep generative model outperforms state-of-the-art approaches.

Houssein et al. (2022) proposed EO-SVR-based forecasting model, which is adopted and evaluated using mean absolute percentage error, average, standard deviation, best fit, worst fit, and CPU time. The proposed EO-SVR model got better results than other the counterparts, and EO-SVR is considered the optimal model according to its superior outcomes.

Kurani et al. (2023) have provided comparative study of ANN and SVM on stock forecasting. The paper covers the recent past studies to explore the concepts and methodologies through which ANN's and SVM's have been used. Additionally, the paper incorporates significant aspects of novel methods and technologies in which ANN as a hybrid model like ANN-MLP, GARCH-MLP, a combination of the Backpropagation algorithm and Multilayer Feed-forward network, yields better results.

3. RESEARCH METHODOLOGY

Table 1: Summary of recent research work with accuracy for stock price prediction.

Year	Author(s)	Technique/ Approach	Result (Accuracy)
2009	Awad et al.	Radial Basis Function Neural Network (RBFN)	Improve the accuracy of time series prediction
2009	Lee et al.	Support Vector Machine (SVM) with F-score and Supported Sequential Forward Search (F_SSFS)	Improve the accuracy
2013	Devadoss et al.	Artificial neural network	Improve the accuracy

		(ANN)	
2013	Devadoss et al.	Multi-Layer Perceptron (MLP)	Predict with high accuracy
2014	Kalyanaraman et al.	Sentiment dictionary	Predicted sentiment using linear regression with normal equation =54.54% and with Gradient Decent=81.81%
2014	Li et al.	Psychological Dictionary of Harvard and Loughran-McDonald's Financial Dictionary.	LMD Achieves the best in both validation (0:5976) and testing (0:5527) when compared to six different approaches.
2014	Niu et al.	Radial Basis Function Neural Network (RBFN)	Improving the precision of forecasting
2015	Bhardwaj et al.	Python scripting language.	Fast prediction of stock market prices.
2015	Haviluddin et al.	Autoregressive integrated moving average (ARIMA) & Radial Basis Function Neural Network (RBFN)	RBFNN more competent in modelling than ARIMA
2016	Akita et al.	Long Short-Term Memory (LSTM)	LSTM was effective for time series data impacts than other models.
2016	Khatri et al.	NLP and Text Analysis Artificial neural network (ANN)	Value determined for each company with a mean square error
2017	Bharathi et al.	Natural Language Processing, lexicon approach (Dictionary Based Approach)	Accuracy improves 14.43% as compared to ID3, C4.5.
2017	Khedr et al.	K-Nearest Neighbor (KNN)	Improve the prediction accuracy up to 89.80%.
2018	Alkubaisi et al.	Hybrid Navie Bayes Classifiers.	Accuracy = 90.38%.
2018	Batra et al.	SVM (Support vector machine)	Accuracy up to 76.65%
2018	Zhang et al.	Heuristic algorithm	Improves the accuracy.
2019	Henrique et al.	Machine Learning Techniques	Forecast market direction
2019	Lee et al.	Logistic Regression (LR), Support Vector Machine (SVM) and Random Forest (RF)	Forecast market direction

2019	Mate et al.	Natural Language Processing	Predict the stock prices
2019	Mohan et al.	Regression, Time series models, Neural Network and financial news articles	Improve the accuracy of stock price predictions.
2019	Selvamuthu et al.	Levenberg-Marquardt (LM), Scaled Conjugate Gradient (SCG) and Bayesian Regularization (BR). Artificial Neural Networks (ANN)	Accuracy up to 99.9%
2019	Shah et al.	Combination of statistical and machine learning techniques	Improve the accuracy.
2020	Ding et al.	Long Short-Term Memory (LSTM)	Accuracy is over 95%.
2020	Guo et al.	Support Vector Machine (SVM)	Accelerate the online learning process
2020	Jin et al.	Sentiment Analysis and Long Short-Term Memory (LSTM)	Improve the accuracy.
2020	Kumar et al.	Workload Forecasting Neural Network (WFNN) with BiPhase adaptive Differential Evolution (BaDE) learning algorithm	Improvements up to 91%, 97% and 97.2% are observed
2020	Reddy et al.	k-NN algorithm, Regression Analysis	Accuracy up to 85%
2021	Dash et al.	Fine-Tuned Support Vector Regression (FTSVR)	More Accurate & Time Efficient
2021	Haq et al.	Feature Selection & Deep Learning	Accuracy up to 59.44%
2022	Houssein et al.	Equilibrium Optimizer with Support Vector Regression (EO-SVR)	Improve the accuracy.
2023	Kurani et al.	Artificial Neural Network (ANN) and Support Vector Machines (SVM)	60–70% accuracy can be obtained using SVM 60%-95% accuracy can be obtained using ANN combined with other technologies.

4. CONCLUSION

Our review study aims to support stockbrokers and investors in their stock market investments. Projection is crucial in the stock market, which is a particularly challenging procedure because of political issues, the financial crisis, and numerous other market-affecting elements. This overview article discusses a variety of machine learning techniques, including NLP, linear regression, KNN,

SVM, LSTM, artificial neural networks, and more. The value of a prediction model is in better advising stockholders, newcomers, and investors on where to hold or invest their shares to maximise profits while minimising risk. On the other hand, if the dataset includes unreliable information and false news, the stock price prediction will be inaccurate.

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A STUDY OF COMPUTER INTELLIGENCE AMONG THE INDIAN JOURNALISTS THROUGH SOCIAL MEDIA

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As the world undergoes digital transformation, the journalism phase has started adapting computer intelligence including hard and soft computing. Hard computing means which was precise and had certain value while in soft computing it has approximate calculation to provide near to accurate but usable solutions to complex computational problems. There are three tools used in soft computing namely fuzzy logic, neural network, and genetic algorithm. It does not require any mathematical model, not a precise solution. Algorithms are adaptive in nature, and we got uncertain output. Applications connecting to this study will be observing how Indian journalists from print, electronic and digital media platforms are accessing both the forms of computing in disseminating information through their Twitter, Facebook, and Instagram, WhatsApp profiles.

Regarding this, a survey with mixed research approach will be conducted among two journalists each from eastern, northern, southern, and central India wherein they will be asked that how they access the above mentioned social media platforms for soft and hard computing in disseminating their news reporting from various beats. Research Problems focused on how frequently use both these types of computing and how it benefits them and futuristic approach. It further saw the pros and cons of both these forms of computing.

Notably if the scenario of Artificial Intelligence (AI) was noticed in terms of technology and media, Sofia is a social humanoid robot developed by the Hong Kong based company which can induce soft feelings among the homo sapiens. She has received the Saudi Arabia denizen ship in 2017 and first non-human to be given a United Nations title. Meanwhile, Sana is the first AI female news anchor to be well versed in multiple languages.

Keywords: Computing, Intelligence, social media, Journalists, Jharkhand

1. INTRODUCTION

1.1 Soft Computing: -

In contrast to classical computing, soft computing works with approximation models and provides solutions to challenging real-world issues. Soft computing, in contrast to hard computing, is accepting of approximations, uncertainty, partial truth, and imprecision. In actuality, the human mind serves as a model for soft computing. Techniques like fuzzy logic, genetic algorithms, artificial neural networks, machine learning, and expert systems are the foundation of soft computing. Although soft computing theory and methods were initially established in the 1980s, automatic control engineering is now focusing a lot of research and study on this field. Nowadays, numerous home, commercial, and industrial applications successfully employ soft computing approaches. It is obvious that the methodologies and application areas of soft computing will keep growing with the introduction of low-cost, extremely high performance digital processors and the decline in the price of memory chips.

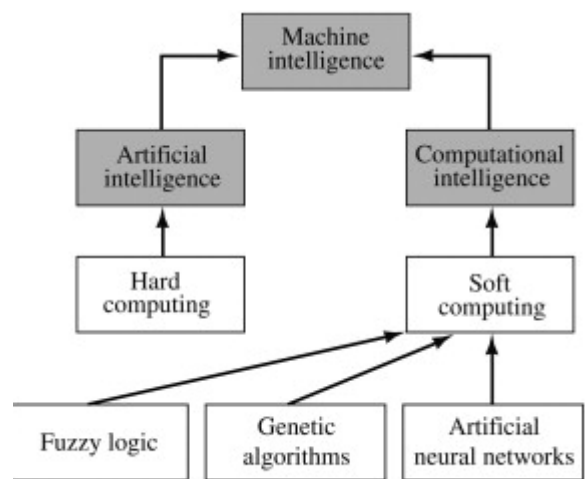


Fig1: Soft Computing Technique : An overview

The term "soft computing" refers to a collection of computational methods based on artificial intelligence (decision making that is similar to that of a human) and natural selection that offer quick and economical solutions to extremely complex problems for which analytical (hard computing) formulations are not available. Zadeh is credited with creating the term "soft computing" (Zadeh, 1992). Soft computing looks for exact approximations that provide a reliable, computationally efficient, and economically advantageous solution while cutting down on computation time. The majority of these strategies are primarily motivated by societal behavioral patterns and biologically inspired occurrences. Research in machine learning, probabilistic reasoning, artificial neural networks (ANN), fuzzy logic, genetic algorithms, and fuzzy logic [Jang et al., 1997] was crucial in the development of soft computing (GA). Nowadays, algorithms like the particle swarm optimization (PSO) and bacterial foraging algorithm (BFO) have broadened the definition of soft computing to encompass swarm intelligence and the foraging habits of biological populations [Holland, 1975; Kennedy and Eberhart, 1995; Passino, 2002].

Soft computing techniques come with a number of unique benefits. They consist of the following:

- The requirement for explicit knowledge in a given domain can be decreased because soft computing solutions do not require extensive mathematical formulation related to the problem.
- These technologies are capable of managing several variables at once.
- Using global optimization techniques, local minima for optimization problems can be avoided in the solutions.
- Most of these methods are economically viable.
- Effective hybridization of soft computing techniques can help lessen dependence on pricey classical simulations packages to some extent.
- These techniques are typically scalable and adaptive.

In order to find solutions to issue statements, soft computing techniques have recently gained acceptance among researchers in several branches of engineering [Patnaik and Mishra, 2000; Patnaik et al., 2005; Samii, 2006; Choudhury et al., 2012]. Regarding diverse issues encountered in every area of engineering, the sturdiness of the aforementioned techniques has undergone extensive testing. In fact, soft computing has been used in microwave applications over the past ten years.

1.2 Hard Computing

We are at a time of computerization. The computing industry is experiencing the most exciting times in its history, taking over almost any area of human activity. Digitalization is any activity in which computers are used. It's all about the pursuit of goals that require use of computers. It covers a broad range of activities related to the design and construction of hardware and software systems. The result is an enormous change of infrastructure and development practices for computing. It is a critical element in modern life, it's an indispensable part. The type of computer you're using is going to make a huge difference in today's technology era. Two types of technologies for resolving problems can exist: hard and soft computing.

Hard computing is an approach to computing that relies on the accurate description of a statistical model. Dr Lotfi Zadeh also introduced the term "hard computing". He actually invented the term "soft computing" before that. The binary logic and the sharp system must be relied upon for reliable computing.

The whole history of the computer can refer in this aspect. Science as a record of continuous efforts Find ideas for computing, study them, and implement them. All computing technology is truly relevant to almost everyone. The aspects of our modern lives that include education, entertainment, transportation, communications, Economy, health care, engineering, and science. The history of computing is one of punctuated in balance, leading to new and unforeseen changes. Mainframes gave birth to minicomputers, which gave birth to workstations, which gave birth to personal Computers, which were instrumental to the development of smartphones. Twovalued logic is used in hard computing. So, there's a deterministic nature to it. It is giving us precise and accurate results. Some specific control actions are defined using a mathematical model or algorithm in hard computing. Hard computing's major weakness is the inability to solve real world problems, whose behavior has been unpredictable and its information changes on a constant basis. For sequential computations, the use of rigid computing is made. It requires accurate analytical models, and in most cases a lot of computation time. Unlike soft computing, which is heuristic, it strictly follows known steps for solving a problem. Hard has nothing to do with hardware here. It is precision, certainty and

seriousness that are the fundamental principles of rigorous computation. The sequential programs that use binary logic are used to achieve hard computing. There is a deterministic nature to it. The input data has to be exact, and the output shall be accurate and verifiable. Hard computing fails to solve the realworld's problems because it does not show exact behavior and information changes on a continuous basis. A traditional approach that follows the principles of certainty, accuracy and rigor is hard computing. For hard computing, accurate and verifiable input data shall be supplied in such a way as to provide the correct and reliable output. Although soft computation does not seek perfect solutions, hard computing results in preciseness. To overcome this problem, it is in the best interests of practical use that Soft and Hard computing be combined. For the economic competitiveness of systems, services, and products there are several applications that take advantage of both tough and soft computing.



Fig 2: Sana : AI based anchor

Anchor Sana is an AI-based news anchor. She listed her advantages, pointing out that the A.I.-based Anchor Sana will never age, not get tired, stumble, speak in many languages, etc. She will show up on Aaj Tak screens and can also respond to your inquiries. It makes advantage of the found Google text-to-speech engine in smartphones.

1.3 How to conduct an event study: -

A basic premise before starting the study methodology is that a survey with mixed research approach will be conducted among two journalists each from eastern, northern, southern, and central India wherein they were asked that how they access the social media platforms for soft and hard computing in disseminating their news reporting from various beats. The questionnaire was as follows:

- (a) Do you access social media?
- (b) How frequently do you access these platforms?
- (c) Which form of computing do you mostly prefer?
- (d) If yes, which platform do you access to share your news?

An analysis has been done according to the responses received.

1.4 Objectives:

- To find a relation between computing and social media among Indian journalists
- To find the impact of user friendly interface of social media platform among the Indian journalists.

1.5 Research Problems:

- How frequently the journalists use both these types of computing for accessing social media for their news stories' dissemination?
- How does it benefit them?

1.6 Research Methodology:

The primary data focused on quantitative and qualitative research design including stratified sampling from probability sampling. Research Method used was survey which refers to the method of securing information concerning a phenomenon under study from all or a selected number of respondents of the concerned universe. In a survey, the investigator examines those phenomena which exist in the universe independent of his action. Following the method, questionnaires were circulated through google form including close and open ended questions among as many as one hundred working journalists from print, electronic and digital media houses based in twenty-nine states of India. Accordingly, the conclusion was drawn.

2. LITERATURE REVIEW:

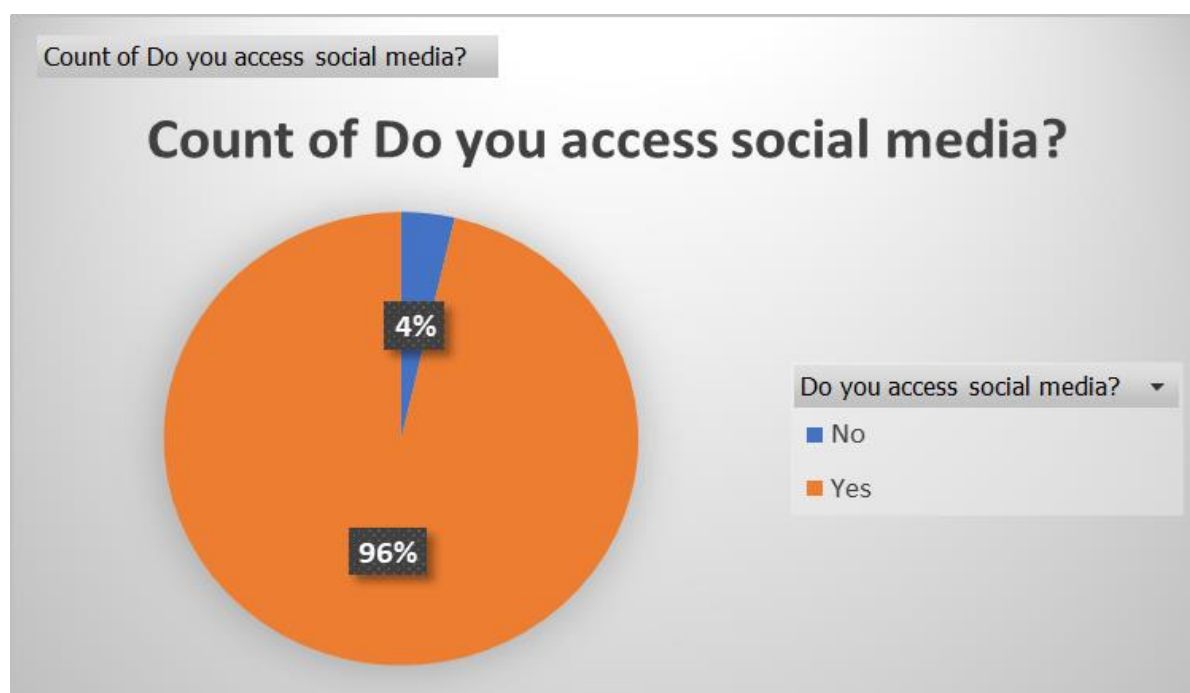
All hard computing approaches modelled with accurate solution which are achieved very quickly. Resultant solution having exactness and full truth. But when these problems come with incomplete knowledge then they fail to achieve the goal. Thus, soft computing techniques are easily applied in this situation with their variety of components. The research community has investigated and explored these techniques over traditional techniques. However, recently, there have been numerous efforts toward making use of soft computing techniques as engineering problems and the optimization solver for science, based on their distinctive characteristics and appropriate use for imprecision, uncertainty, partial truth, and approximation scenarios to achieve practicability and robustness as a low-cost solution, e.g., evolutionary and swarm intelligence-based algorithms as well as bioinspired computation, which are applicable for real-world scenarios (Chakraborty, 2017). Several surveys have been conducted in the last few decades. Each survey deals with individual areas, either soft computing technique or any one constituent component of soft computing. No one describes what is the relation between soft computing with hard computing. In which area hard computing fails to achieve the goal and soft computing deals with that goal.

Data journalism is an evolving form of investigative journalism. In previous research and handbooks published on this topic, this form of journalism has been called computer-assisted reporting and data-driven journalism, as well as precision, computational or database journalism. In Sweden, data journalism is still uncommon (Appelgren, 2014).

The increasing presence of artificial intelligence and automated technology is changing journalism. While the term artificial intelligence dates to the 1950s, and has since acquired several meanings, there is a general consensus around the nature of AI as the theory and development of computer systems able to perform tasks normally requiring human intelligence. Since many of the AI tools journalists are now using come from other disciplines—computer science, statistics, and engineering, for example—they tend to be general purpose. Now that journalists are using AI in the newsroom, what must they know about these technologies, and what must technologists know about journalistic standards when building them? On June 13, 2017, the Tow Center for Digital Journalism and the Brown Institute for Media Innovation convened a policy exchange forum of technologists and journalists to consider how artificial intelligence is impacting newsrooms and how it can be better adapted to the field of journalism. The gathering explored questions like: How can journalists use AI to assist the reporting process? Which newsroom roles might AI replace? What are some areas of AI that news organizations have yet to capitalize on? Will AI eventually be a part of the presentation of every news story? (Hansen, 2017).

3. SURVEY ANALYSIS:

Q1. Do you access social media?



Out of the 110 responses, we found that 96.4% agreed that they use social media.

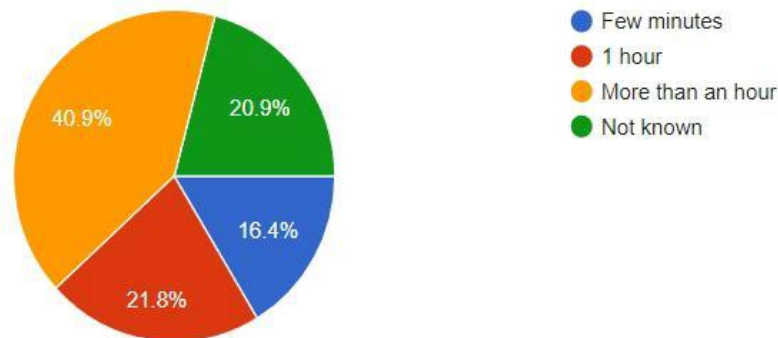
Analysis: User-generated content, connectivity, and interactivity are the defining characteristics of social media. Utilizing social media daily is now a necessity. Social media is primarily utilised for decision-making, news and information access, and social interaction. It is a useful tool for sharing, creating, and disseminating information as well as for communicating with people locally and globally. In essence, social media has a significant impact on our capacity for communication, the development of relationships, information access and dissemination, and making the best decisions.

News and journalism are among the areas that social media has had the biggest impact on. The use of print media is declining, and publications are being pushed to post their material online as the internet has become the quickest and most convenient means to obtain news. Another result of this improved technology is that now almost anyone can call themselves a "journalist," and they can create news they believe to be reliable and truthful.

Q2. How frequently do you access these platforms?

How frequently do you access these platforms?

110 responses



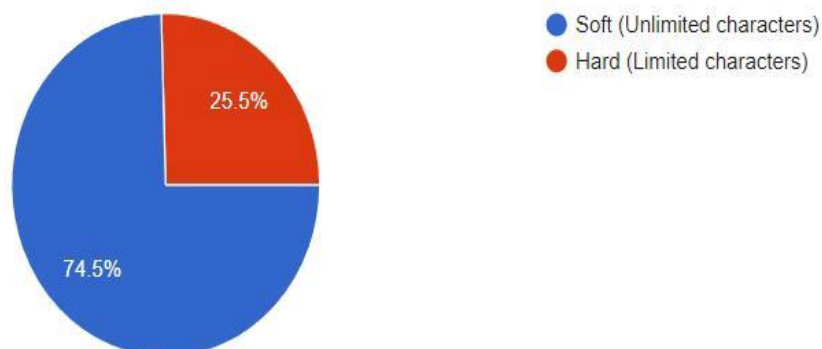
Out of the 110 responses, we found that 40.9% of the audience use social media for more than

an hour, 21.8% uses social media for one hour, 20.9% uses social media in which they didn't have any time duration or time limit, but they used it frequently for hours, and 16.4% uses social media for few minutes.

Q3. Which form of computing do you most prefer?

Which form of computing do you mostly prefer?

110 responses



Out of 110 responses, we found that 74.5% of users preferred Soft (Unlimited characters) whereas 25.5% preferred Hard

(Limited characters) for computing.

In essence, soft computing is biologically based and draws inspiration from a variety of evolutionary processes. As a result, the soft computing models can be.

Linguistic

Comprehensible

During computing, swift

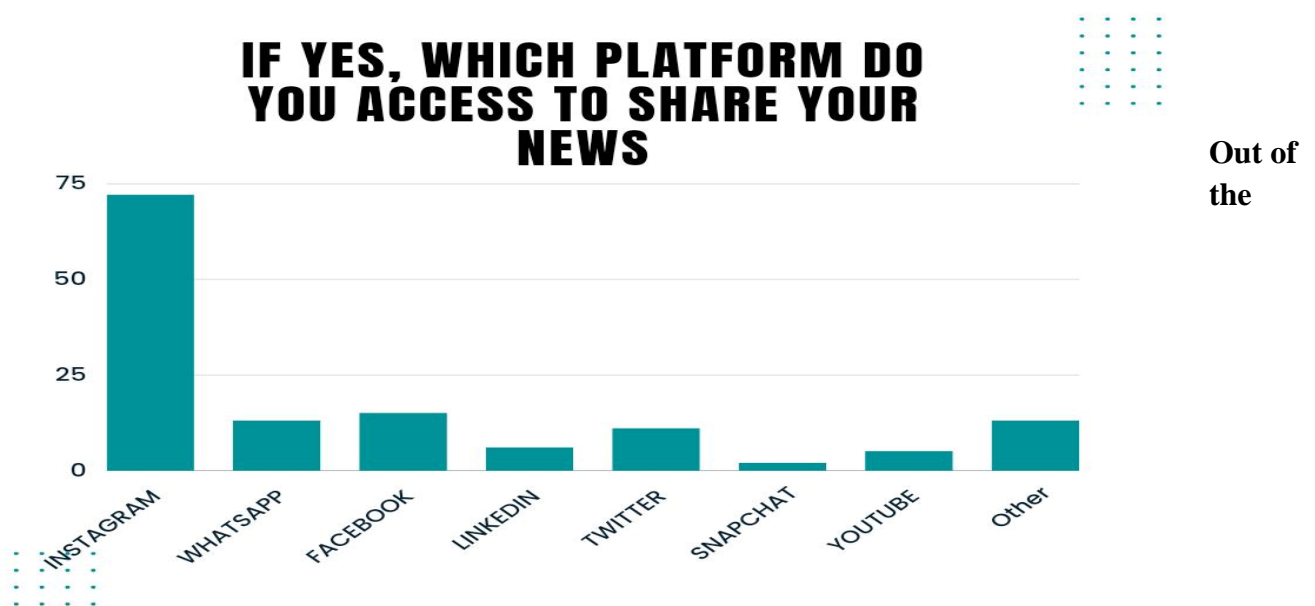
Effective in resolving problems in the actual world.

The journalist has great flexibility when defining computational language for real-world issues thanks to soft computing models. The use of soft computing has several benefits.

The differences between hard computing and soft computing.

- Hard computing demands a precise state analytical model, whereas soft computing is tolerant of ambiguity and imprecision.
- Hard computing requires precision, whereas soft computing employs approximation.
- Soft computing algorithms can evolve and improve themselves. Hard computing methods occasionally need to be updated or modified to meet the shifting demands of the ecosystem.
- Hard computing uses binary logic, whereas soft computing uses multi-valued logic. Users of multi-valued logic have options for defining a system's various states. This capacity allows the machine the freedom to mimic scenarios as closely as possible.

Q4. If yes, which platform do you access to share your news views or news stories?



analysis done, the most accessed social media for sharing the news was Instagram whereas the least was Snapchat.

Another result of this improved technology is that now almost anyone can call themselves a "journalist," and they can create news they believe to be reliable and truthful. We can produce, share, and disseminate noteworthy or gossipy tales around the world almost immediately. This has only been made simpler by social media. Popular news stories are reported via Twitter and other social networking sites, reaching a global audience nearly immediately. Because of social media, our culture is now better informed about current events and news around the world.

Social networking websites are possibly the most effective social media tool. Whether they use social media regularly or not, most people are familiar with the names Facebook, Twitter, Tumblr, Blogger,

LinkedIn, and Google +. Most people between the ages of 13 and 64 have a Facebook account. People from all over the world can connect on these social networking platforms. The options for communication for organisations like businesses, schools, and other groups are virtually unlimited.

Q5. What is your opinion on computational intelligence with news reporting?

Computational Intelligence (CI) is the theory, design, application, and development of biologically and linguistically motivated computational paradigms so bringing it with news reporting would be a great idea
Computational intelligence is a novel and advanced tool for solving complex problems that are challenging to address with conventional techniques.
It makes news more transparent and accountable. Additionally, the well and good news will be circulated more.
The new way of spreading the news among the youth.
It's going to be a time saviour and the audience will get relevant data It's better than television Computational intelligence will only show the news, which is being telecasted worldwide, without knowing the ground reports.
It helps us to understand News in a logical way Should be specified news for a particular one. News should be relevant to other benefits for other Adopting AI enables automatic optimization of text, visual and voice search and facilitates the delivery of some of the most relevant search results.
A unique and effective way of news broadcast Intelligence makes news reporting easier and faster but also substitutes employment.
Computational intelligence can be useful in news reporting as it can process and analyse large amounts of data, identify patterns, and automate certain aspects of reporting. However, it should be used as a complement to traditional journalism, not a replacement, and there are concerns about potential biases and inaccuracies.
Computer intelligence has both positive and negative impacts to the industry. Governments in the region are also using computer intelligence to influence the media, further shaping the landscape of journalism. On the positive side, computer intelligence is improving the efficiency and accuracy of news reporting.
CI, therefore, uses a combination of five main complementary techniques. It's quite helpful for people like us who don't have access to daily newspapers or news channels. Helpful to gain intelligence. No, I don't agree to provide all the work to AI. In my opinion, this will lead to unemployment.
Computational Intelligence, therefore, provides solutions for such problems. The methods used are close to the human's way of reasoning, i.e., it uses inexact and incomplete knowledge, and it is able to produce control actions in an adaptive way. CI, therefore, uses a combination of five main complementary techniques. It is a good medium for news reporting and telecasting as most youngsters are there.

4. CONCLUSION:

Based on the objectives, it was noticed that out of the 110 respondents 40.9% of the audience access social media for more than an hour, 21.8% accesses social media for one hour, 20.9% access social media in which they didn't have any time duration or time limit, but they accessed it frequently for hours, and 16.4% accessed social media for few minutes. Out of the analysis done, the most accessed social media for sharing the news was Instagram whereas the least was Snapchat. Relating to the second objective, it was found that, computing makes their news more transparent and accountable.

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A REVIEW REPORT ON THE IMPACT OF ARTIFICIAL INTELLIGENCE (AI) IN CONTEXT TO HEALTHCARE AND SOCIO-ECONOMICAL CHANGES: AN INDIAN PERSPECTIVE

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The term ‘Artificial Intelligence (AI)’ is in itself very fascinating to hear and learn about. The way we are evolving with time is not something hidden in the facts; we had petrol cars with manual functions in the previous decade and now we have electric cars with self-driving, self-parking, and numerous other automated functions. The notion of AI is persisting as long back as the 1950s. In those days, people accustomed have possessed high hopes towards the success of AI in every sector of society.

AI is computer-centric tool technology proficient in easily solving various problems within complex situations in a flawless, cost-effective, and quick manner without the slightest assistance of humans. The technology uses deep learning algorithms and machine learning algorithms to process. This deep learning technology is not limited it is creative and thus, can show creativity after receiving the data algorithm. The deep learning technology in AI is a digital revolution that is about to change society and it is a revolution that has the potential to change humanity in the future.

The above titled paper will provide an overview of how AI has evolved in numerous ways from robotics to Virtual Reality, from hard work to smart work with the help of AI itself! The best example is Google’s DeepMind itself. But if something is profitable doesn’t mean it would not have any adverse effects! However, how much AI would benefit humans, it lacks in one area, which is, sharing the same values as we do and so, somewhere it generates ethical concerns.

AI has a significant impact on socio-economics, as it affects the way people work, live, and interact with each other. Here are some ways in which AI has influenced socio-economics:

1. Employment: AI has disrupted many industries and automated many jobs. This has resulted in job losses in some sectors, while creating new jobs in others.
2. Economic growth: AI has the potential to drive economic growth by increasing productivity and efficiency. This is especially true in industries such as healthcare, transportation, and manufacturing.

3. Inequality: AI has the potential to exacerbate existing inequalities in society. For example, those with access to AI technology and training will be better equipped to take advantage of its benefits.
4. Privacy: AI relies on data to function, and this has raised concerns about privacy
5. Ethics: There are also ethical concerns surrounding AI, particularly in areas such as bias and discrimination.

Overall, AI has the potential to transform the socio-economic as well as healthcare landscape in significant ways. It is important to ensure that its benefits are distributed fairly and that its potential negative impacts are minimized.

Keywords: Artificial Intelligence, Deep learning, Machine learning, Google's DeepMind, Ethical concerns.

1. INTRODUCTION

Intelligence, the ability to accumulate and apply knowledge and skills, has been the hallmark of human superiority. Over time, humans have evolved and developed superior decision-making and analytical skills. To keep up with the ever-changing demands of society, researchers, scientists, physicists, and engineers have come together to create an advanced system for the betterment of human lives. This system is known as Artificial Intelligence (AI), and it has the potential to revolutionize the way we live our lives.

The notion of AI has been around since the 1950s, and people have had high hopes for its success in every sector of society. AI is a computer-centric tool that is proficient in easily solving various complex problems in a flawless, cost-effective, and quick manner without the slightest assistance from humans. Its applications are related to the analysis of data, including personal information, for learning and arriving at accurate decisions intelligently.

The ever-proliferating usage of AI in every sphere of society in various sectors has brought about multifarious vital challenges, including facing a range of legal and ethical dilemmas. At the same time, AI is also fueling bioethical concerns. There are questions about the trustworthiness of AI systems, including the risk to the economy and labor of humans, codifying and reinforcing existing biases, such as those associated with gender or race, or infringing on human rights and values, such as privacy.

This research paper aims to understand the impact of AI on human lives, especially in the context of socio-economic changes in India. This research paper maps the social and economic impacts of AI

technologies and applications and their policy implications, as well as the advantages and drawbacks of AI in human lives. By examining the impact of AI on healthcare and socio-economic changes in India, this paper attempts to provide a comprehensive understanding of the potential of AI and its impact on society.

The paper begins by providing an overview of AI and its various applications. It then examines the impact of AI on healthcare and socio-economic changes in India, focusing on the benefits and drawbacks of AI in these sectors. The paper also addresses the ethical and legal concerns raised by AI and its potential impact on society. Finally, the paper concludes by summarizing the key findings and outlining the policy implications of AI in the Indian context.

AI has the potential to bring about significant changes in society, including healthcare and socio-economic changes. However, it also poses several challenges and raises ethical and legal concerns. By examining the impact of AI on human lives in India, this research paper attempts to provide a comprehensive understanding of the potential of AI and its impact on society.

2. LITERATURE REVIEW

The impact of Artificial Intelligence on the ground of overall socio-economical changes in respect to Indian system: A literature Review (This thematic literature review will provide a greater insight about how the technological advancements is affecting the society in large especially how on the grounds of how it is impacting the socio-economical dynamic of India.)

3. RESEARCH METHODOLOGY

This research paper titled, ‘A Review Report On The Impact Of Artificial Intelligence (AI) In Context To Healthcare And Socio-Economical Changes In Respect To India,’ will be a Qualitative type of research. Secondary type of data will be collected to depict the references and Google Doc questionnaire will be acquired to collect the data from generalised population accessing gadgets.

3.1 Data Set

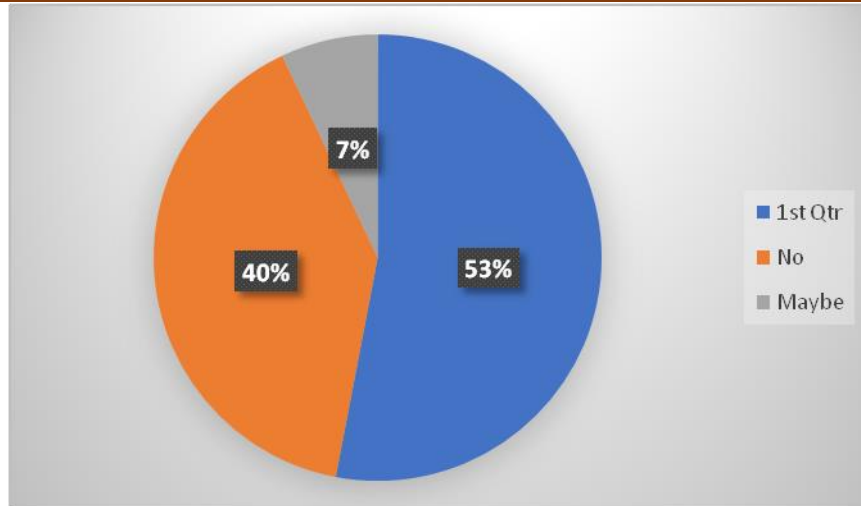


Figure 1 : - Can we trust the robustness, security and safety that are being promoted by AI systems?

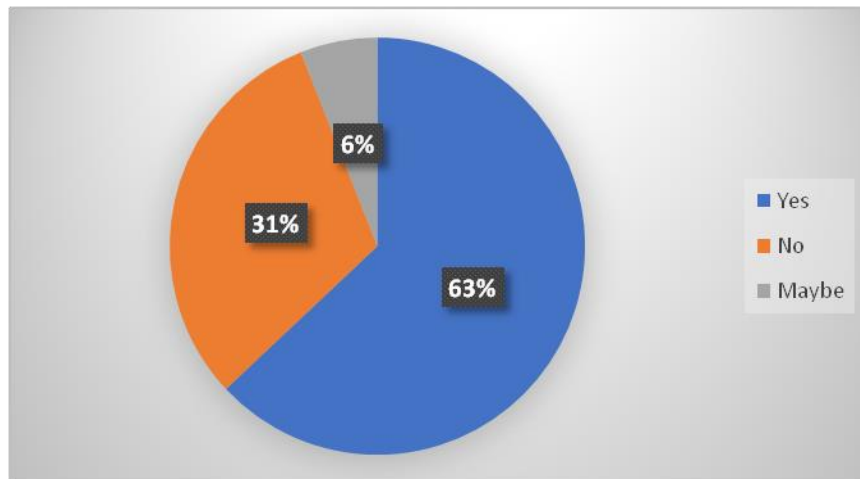


Figure 2 : -What is the role of AI as a new general-purpose technology?

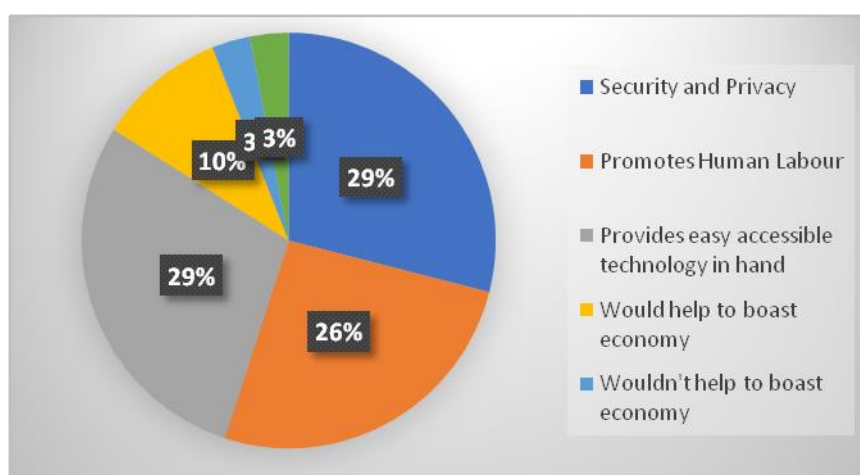


Figure 3 : -Replacing human labor with AI will be beneficial or not?

4. CONCLUSION

To anticipate one's needed before we have to ask. In this new algorithmic age, how do you use data to understand people's behaviour, to anticipate their needs before they have even had to ask. And this is happening in places like China. They are so far ahead. They have got fully automated convenience stores like 7-elevens on steroids. They use facial recognition algorithms to restock themselves and merchandise. They have also got robot hotels and restaurants, smart home collection devices that expand when you have deliveries for stop even the beggars in the street don't want coins anymore comment they got QR codes to donate is straight to their smart phones.

So, we can see, we are already at beginning of a fundamental transition to a different kind of world with a different way of living and that is not just going change our interactions but the way we interface with technology.

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A STUDY OF SYSTEMATIC MAPPING IN CYBERSECURITY THREATS AND VULNERABILITIES

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There exists a considerable increase in counter terrorism studies in favor of websites and applications and to mitigate the substantial privacy issues that these apps face. The purpose of this investigation is to identify and assess most common security holes. A thorough cartography analysis was conducted to achieve this goal. After an in-depth assessment of the selected research, the key safety flaws and their prevalence of incidence were identified. Moreover, information was compiled, analyzed, and presented to show the nation, posting the spot, key objective structures apps, etc. The results show that the safety strategies earlier addressed only deal with safety usually and that a greater degree of empirical study and real-world application are needed for the study recommended fixes. Our findings also show that many of the studies selected for this review concentrated solely on a limited number of widely utilized security weaknesses, such as malware, phishing, and denial-of-service attacks. The key cybersecurity vulnerabilities, targeted/victimized apps, mitigation strategies, networking programs, etc. must all be identified for researchers and developers to have a greater awareness of it.

Keywords: - Cybersecurity Threats, cartography analysis, Systematic Mapping, cybersecurity vulnerabilities, targeted/victimized apps, mitigation strategies, networking programs.

1. INTRODUCTION

Cyber risk estimates today tend to be based on gut feeling and best guesses. Improved justification and traceability can be achieved through data-driven decisions, but this is not straightforward. With evolving technology and constantly emerging attack methods (and motivations), basing security decisions on past incidents is typically referred to as “driving forward by looking in the rear-view mirror” [1] and cannot be considered reliable. As a remedy to historical data and guesswork, Anderson et al. [2] suggested in 2008 to use forward-looking indicators as an alternative source of decision data, but now, more than a decade later, have we really succeeded in doing this? The purpose of this paper is to present a systematic mapping study of the literature related to cyber security indicator data. As defined by Kitchenham and Charters [3] and Petersen et al. [4], systematic mapping studies provide an overview of a research area through classification of published literature on the topic. This is somewhat different from systematic literature reviews, which focus more on gathering and synthesizing evidence [4], typically from a smaller set of publications. We identified relevant research and classified their approaches according to a scheme. This contributes to a broad overview of the research field, showing concentrations of effort and revealing areas that need more attention. We then have the possibility to debate if we still base our risk estimates on guts, guesses and past incidents, or whether we have managed to move the field forward, i.e., towards making informed cyber security decisions from relevant indicators.

- a) **Cybersecurity Threats** - Cybersecurity threats are malicious activities or events that can compromise the confidentiality, integrity, or availability of information or information systems. These threats can be caused by various factors, such as hackers, malware, phishing attacks, social engineering, and insider threats. Cybersecurity threats can lead to various consequences, including data breaches, financial losses, reputation damage, and legal liabilities. To protect against cybersecurity threats, organizations need to implement effective security measures, such as firewalls, antivirus software, intrusion detection systems, and security awareness training for employees.
- b) **Cartography analysis**- Cartography analysis, also known as mapping analysis, is a method used to visually analyze and represent data. It involves mapping data to a geographic location, allowing patterns and relationships to be identified and understood. This type of analysis is commonly used in fields such as geography, urban planning, and social sciences to analyze spatial patterns and trends. In the context of cybersecurity, cartography analysis can be used to map and analyze network traffic, identify potential vulnerabilities, and visualize attack patterns. By visually representing complex data in a geographic or network topology context, cartography analysis can help to identify insights and trends that may not be apparent through other types of analysis.
- c) **Systematic Mapping** - Systematic mapping is a type of literature review that provides an overview of a particular research area by classifying and organizing published literature on a topic. The aim of a systematic mapping study is to identify the scope and scale of the research in a particular field, identify gaps in the literature, and provide a foundation for future research. Unlike traditional narrative reviews, which often rely on the authors' subjective selection of articles, a systematic mapping study uses a rigorous methodology to identify and analyze relevant articles, ensuring that the review is comprehensive and unbiased. Systematic mapping studies are typically used to provide a broad overview of a field of research, rather than to answer specific research questions.
- d) **Cybersecurity vulnerabilities** – Cybersecurity vulnerabilities refer to weaknesses or flaws in software, hardware, or network systems that can be exploited by attackers to gain unauthorized access, disrupt services, steal data, or cause other types of harm. These vulnerabilities can exist in any component of an information system, including applications, operating systems, databases, network protocols, or user interfaces. They can arise due to coding errors, design flaws, misconfigurations, or outdated software. Cybersecurity vulnerabilities can be classified into different types, such as buffer overflow, cross-site scripting, SQL injection, weak encryption, or insecure authentication. Identifying and addressing these vulnerabilities is crucial for ensuring the security and integrity of information systems and protecting against cyber attacks.
- e) **Targeted/victimized apps**- Targeted or victimized apps refer to specific software applications or platforms that are deliberately chosen and attacked by cybercriminals or threat actors for various purposes, such as stealing sensitive data, spreading malware, or disrupting operations. These apps are often popular and widely used, making them attractive targets for attackers. Examples of targeted/victimized apps include social media platforms, email clients, financial software, and healthcare applications.

- f) **Mitigation strategies-** Mitigation strategies refer to a set of actions or measures taken to reduce or prevent the impact of a cybersecurity threat or vulnerability. These strategies aim to minimize the likelihood of a cyber attack or to lessen the damage caused by one if it does occur. Examples of mitigation strategies include implementing firewalls, encrypting sensitive data, using multi-factor authentication, regularly updating software and patches, and providing employee training and awareness programs. The effectiveness of mitigation strategies depends on the specific threat and the security measures implemented.
- g) **Networking programs -** Networking programs refer to software applications or tools that facilitate communication and data exchange between devices or computers over a network. These programs include protocols and services that allow devices to connect and interact with each other, such as TCP/IP, DNS, FTP, and SSH. Networking programs are essential for modern computer systems to function and enable a wide range of online activities, from web browsing and email to file sharing and remote access. However, they can also pose security risks if not properly configured and secured, and can be targeted by cyber attacks to gain unauthorized access to systems or steal data. Therefore, it is important to implement appropriate security measures, such as firewalls, encryption, and access controls, to protect against such threats.

Types of types of Cybersecurity Threats

- a) **Malware:** Malware is malicious software that is designed to infiltrate and damage a computer or network. This includes viruses, worms, trojan horses, and ransomware.
- b) **Phishing:** Phishing is a type of social engineering attack where an attacker tries to trick a victim into revealing sensitive information or downloading malware. This is usually done through emails, text messages, or fake websites that look legitimate.
- c) **Man-in-the-middle attacks:** In a man-in-the-middle attack, an attacker intercepts communication between two parties and can eavesdrop on or modify the messages being sent. This can be done by using a compromised Wi-Fi network or by exploiting vulnerabilities in software.
- d) **Denial-of-service attacks:** A denial-of-service (DoS) attack involves overwhelming a server or network with traffic so that it becomes unavailable to legitimate users. This is often accomplished using botnets or other means of flooding a system with requests.
- e) **Advanced persistent threats:** Advanced persistent threats (APTs) are long-term, targeted attacks that are often carried out by skilled and motivated hackers. APTs are designed to remain undetected for as long as possible, and may involve sophisticated tactics like spear-phishing and zero-day exploits.
- f) **Insider threats:** Insider threats refer to security risks posed

Cyber security Parameters

Cybersecurity parameters are the measures put in place to protect computer systems, networks, and devices from potential cyber threats. These parameters can include:

- a) **Access Control:** Access control is the process of limiting access to computer systems, networks, and devices to authorized users only. This is done through the use of usernames, passwords, and other authentication methods.

- b) **Encryption:** Encryption is the process of converting data into a secret code to prevent unauthorized access. This is often done through the use of encryption software or hardware.
- c) **Firewall:** A firewall is a network security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules. This helps prevent unauthorized access to a network or computer system.
- d) **Intrusion Detection and Prevention:** Intrusion detection and prevention systems are designed to detect and prevent unauthorized access to a computer system, network, or device. This can include monitoring network traffic, identifying and blocking malicious activity, and alerting system administrators to potential threats.
- e) **Incident Response:** Incident response is the process of identifying, analyzing, and responding to potential cyber threats. This can include developing a plan for responding to security breaches, training employees on security protocols, and regularly testing security measures.
- f) **Patch Management:** Patch management involves keeping computer systems and software up-to-date with the latest security patches and updates. This helps prevent known vulnerabilities from being exploited by cyber attackers.

2. LITERATURE REVIEW

The purpose of this literature review is to evaluate the existing knowledge on security flaws in websites and applications that are being used for counter-terrorism efforts. The study aims to identify the most common security vulnerabilities and assess the prevalence of these flaws to inform future research and development efforts. The researchers conducted a thorough cartography analysis to identify the key safety flaws and their incidence rate. The review also examines the extent to which previous studies have addressed security concerns in these apps and identifies areas that require further empirical investigation.

The results of the review indicate that existing safety strategies have primarily focused on general security issues and that further empirical research and real-world application are needed to address the identified security vulnerabilities. The review highlights that many of the studies selected for the analysis have only examined a limited number of security weaknesses, such as malware, phishing, and denial-of-service attacks. Therefore, researchers and developers need to identify all the key cybersecurity vulnerabilities, targeted/victimized apps, mitigation strategies, networking programs, etc. to gain a comprehensive understanding of the security landscape in these apps.

The study emphasizes the need for researchers and developers to have a greater awareness of the security vulnerabilities that exist in counter-terrorism apps and websites. This awareness will enable them to design effective mitigation strategies that can address the identified security flaws. Additionally, the review suggests that empirical studies are needed to provide a more detailed understanding of the security landscape and inform the development of effective countermeasures. Overall, the literature review highlights the importance of conducting thorough research to identify and mitigate security vulnerabilities in counter-terrorism websites and applications.

3. RESEARCH METHODOLOGY

Cyber security is a complex and constantly evolving field, with new attack methods and motivations emerging all the time. As a result, traditional methods of estimating cyber risk, such as relying on historical data or making best guesses, may not be reliable or effective. To address this issue, the authors of this paper conducted a systematic mapping study of the literature related to cyber security indicator data, with the aim of providing an overview of the research area and identifying areas that need more attention.

The study begins by highlighting the limitations of current approaches to estimating cyber risk, which are often based on gut feeling and historical data. The authors argue that these methods are not reliable because they do not take into account the constantly evolving nature of cyber threats. Instead, they suggest that data-driven decisions based on forward-looking indicators could provide a more effective approach to managing cyber risk.

The study then goes on to examine whether the use of forward-looking indicators has been successful in the decade since it was first proposed by Anderson et al. (2008). To do this, the authors identify relevant research and classify their approaches according to a scheme. This enables them to provide a broad overview of the research field and identify areas that require more attention.

The results of the study suggest that while there has been some progress in using forward-looking indicators to manage cyber risk, there is still much work to be done. The authors identify several challenges that must be addressed if this approach is to be successful, including the need for better data sources, more advanced analytical techniques, and greater collaboration between researchers and practitioners.

Despite these challenges, the authors argue that the use of forward-looking indicators has the potential to revolutionize the field of cyber security. By providing a more data-driven approach to risk management, this approach could help organizations to identify and address emerging threats more effectively. However, to achieve this, more research is needed to develop better data sources and analytical techniques.

Overall, the study makes an important contribution to the ongoing debate about how best to manage cyber risk. By highlighting the limitations of current approaches and the potential benefits of using forward-looking indicators, the authors provide a roadmap for future research in this area. This, in turn, could help to make cyber security more effective and resilient in the face of constantly evolving threats.

4. RESULT ANALYSIS

In summary, the research methodology presented in this paper involves a systematic mapping study of the literature related to cyber security indicator data. The study aims to provide an overview of the research area and identify areas that require more attention. The study identifies the limitations of current methods of estimating cyber risk, which are often based on gut feeling and historical data, and suggests that data-driven decisions based on forward-looking indicators could provide a more effective approach to managing cyber risk.

The study finds that while there has been some progress in using forward-looking indicators to manage cyber risk, there is still much work to be done. The authors identify several challenges that must be addressed if this approach is to be successful, including the need for better data sources,

more advanced analytical techniques, and greater collaboration between researchers and practitioners.

The authors argue that the use of forward-looking indicators has the potential to revolutionize the field of cyber security. By providing a more data-driven approach to risk management, this approach could help organizations to identify and address emerging threats more effectively. However, to achieve this, more research is needed to develop better data sources and analytical techniques.

Overall, the study makes an important contribution to the ongoing debate about how best to manage cyber risk. By highlighting the limitations of current approaches and the potential benefits of using forward-looking indicators, the authors provide a roadmap for future research in this area. This, in turn, could help to make cyber security more effective and resilient in the face of constantly evolving threats.

Percentage of Various Attacks

- a) Malware attacks have been one of the most common types of cyber attacks for many years, and they continue to be a significant threat in 2022. According to the 2021 Data Breach Investigations Report by Verizon, 85% of all malware attacks are delivered via email. This highlights the importance of email security measures such as spam filters, anti-virus software, and employee training to recognize and report suspicious emails.
- b) Phishing attacks are also a prevalent threat and are often used to steal personal information such as login credentials or credit card details. According to a 2021 report by the Anti-Phishing Working Group, phishing attacks increased by 22.7% in the first quarter of 2021 compared to the previous year.
- c) Man-in-the-middle attacks (MITM) involve intercepting communication between two parties to steal data or inject malware into the system. While these types of attacks are less common than others, they can be very dangerous as they can go unnoticed for a long time. According to the 2021 Global Threat Intelligence Report by NTT Ltd., MITM attacks accounted for 6% of all detected attacks in 2020.
- d) Denial-of-service (DoS) attacks involve overwhelming a system or network with traffic to make it unavailable to users. DoS attacks can be carried out by hackers or even botnets, and they can be very damaging to a business or organization. According to the 2021 Global Threat Intelligence Report by NTT Ltd., DoS attacks accounted for 23% of all detected attacks in 2020.
- e) Advanced persistent threats (APT) are a type of targeted cyber attack that involves a prolonged and sophisticated effort to gain access to a specific system or network. These types of attacks can go undetected for long periods, and they can be very difficult to prevent. According to the 2021 Global Threat Report by CrowdStrike, APT attacks increased by 65% in 2020 compared to the previous year.
- f) Insider threats are a significant threat to organizations, as they involve malicious or unintentional actions by employees or contractors who have access to sensitive data or systems. According to a 2021 Insider Threat Report by Proofpoint, 63% of organizations experienced an insider-related incident in the past year. These incidents can include data theft, credential misuse, and sabotage. It's important for organizations to have strong security policies and employee training to prevent and detect insider threats.

5. FUTURE SCOPE

The research presented in this paper provides a solid foundation for future work in the field of cyber security indicator data. The authors have identified several areas that require further attention and have suggested avenues for future research. Here are some potential areas for future work:

- a) Developing better data sources: The authors note that one of the main challenges to using forward-looking indicators for cyber risk management is the lack of reliable data sources. Future research could focus on developing new data sources or improving existing ones, such as threat intelligence feeds or network traffic analysis.
- b) Improving analytical techniques: The authors also highlight the need for more advanced analytical techniques to make better use of forward-looking indicators. Future work could focus on developing new analytical methods, such as machine learning algorithms or predictive modeling, to better identify emerging threats and prioritize risk management strategies.
- c) Collaboration between researchers and practitioners: The authors note that greater collaboration between researchers and practitioners is needed to ensure that research results are effectively translated into practice. Future research could focus on ways to promote collaboration and knowledge sharing between these two groups, such as developing training programs or creating forums for discussion.
- d) Application to specific industries: The study provides a broad overview of the research field, but future work could focus on applying these concepts to specific industries, such as healthcare or finance. This could help to identify industry-specific risks and develop tailored risk management strategies.
- e) Ethical considerations: As cyber security indicator data becomes more widely used, it is important to consider the ethical implications of its use. Future research could focus on developing ethical frameworks or guidelines for the collection and use of this data.

Overall, the research presented in this paper provides a strong foundation for future work in the field of cyber security indicator data. By identifying the limitations of current methods and suggesting avenues for future research, the authors have provided a roadmap for developing more effective and data-driven approaches to managing cyber risk.

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A SURVEY ON TRACKING CYBER CRIME USING ARTIFICIAL INTELLIGENCE -PHISHING

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Most disruptive action which is performed on the Internet is phishing. Personal files or any business-related information will be at risk if a user gets attack by such actions. These attacks are getting increased day by day. Phishing is a type of cyberattack which engages special tools and steps to obtain sensitive information from users. Some attack is carried by inducing a URL which looks similar to a legitimate URL to steal the user's important files. Aim of this research is to detect malicious sites made by attackers to steal user's personal information in the aim of conducting illicit activities. Users are therefore always unable to understand when a phishing attack has occurred. Not being aware of the attack results in critical consequences for the user, who could permanently lose valuable information. Tracking cybercrime phishing using AI requires a comprehensive framework that includes multiple stages and components. So Machine learning has been described as an effective measure in avoiding most cyber-attacks. The development of AI has therefore promoted increased security for most computer attacks so that Phishing attacks which are risky can be prevented through AI-based solutions.

Keywords:- Phishing, legitimate URL, illicit activities, Machine Learning, cyber-attacks.

1. INTRODUCTION

In recent years, Internet had an enormous growth and there has been also enormous growth of web service. Even web attacks have increased in large numbers and even improved in quality. One of the popular attacks which is growing since many years is Phishing and is carried out to steal user's personal and important information such as bank details, passwords and other important files which may cause harm to user if used for illicit activities. Phishing is done with different communication forms such as instant messaging, email, SMS, etc. But mostly users get tricked by phishing attack is caused through uniform resource locator (URL). A phishing attack is among the most common types of cyber security attacks. This type of attack involves some type of social engineering where the attacker sends fraudulent messages tricking the victim into providing his credentials. This attack may also be included in sending malicious software requiring ransom or impacting a person's computer.

Initially, the phishing attacks were performed on telephone networks also known as Phone Phreaking which is the reason the term "fishing" was replaced with the term "Phishing", ph. replaced f in fishing. From the reports of the anti-phishing working group (APWG), it can be confirmed that phishing was discovered in 1996 when America-on-line (AOL) accounts were attacked by social engineering. Phishing turns into a danger to numerous people, especially individuals who are unaware of the dangers while being in the internet world.

2. PHISHING OVERVIEW

Phishing is a type of cybercrime whereby cyber criminals send spam messages containing malicious links, designed to get targets to either download malware or follow links to spoof websites. These messages were traditionally emails, but have since been employed through texts, social media and phone calls.

Phishing remains the most common form of cybercrime. Of UK businesses that suffered a cyber-attack in 2022, 83% say the attack was phishing. Globally, 323,972 internet users fell victim to phishing attacks in 2021. This means half of the users who were a victim of cybercrime fell for a phishing attack. This is despite Google's cyber security measures blocking 99.9% of phishing attempts from reaching users. With an average of \$136 lost per phishing attack, this amounts to \$44.2 million stolen by cyber criminals through phishing attacks in 2021.

Phishing attacks largely target victims through emails. In 2021, there was a global average of 16.5 leaked emails per 100 internet users. These breached databases are sold on black marketplaces on the dark web, meaning cyber criminals can purchase them and use the addresses in phishing attacks.

Nearly 1 billion emails exposed, affecting 1 in 5 internet users in 2021. This may partly explain the continued prevalence of phishing attacks. It is more important than ever for businesses to take cyber security seriously.

A 2019 study highlighted that spear phishing was the most popular avenue for attack for cyber criminals. These phishing campaigns were used by 65% of all known groups. The primary motive for these attacks was overwhelmingly intelligence gathering, with 96% of groups using targeted attacks for this reason.

In 2022, the most common URL included in phishing emails links to websites with the '.com' domain, at 54%. The next most common domain is '.net' at less than 8.9%. The most common domain names with '.com' for Q2 2022 are:

- Adobe
- Google
- Myportfolio
- Backblaze2
- Weebly

The risk that phishing poses is clear. A data breach that exposes 10 million records costs businesses \$50 million on average. An attack that compromises 50 million records can cost as much as \$392 million.

The growing cost-of-living crises experienced by economies globally are providing fertile ground for cyber criminals to launch phishing campaigns. In the UK, scammers impersonated the energy regulator Ofgem in their attempts to harvest financial information. In response, Ofgem contacted all UK energy suppliers and asked them to update their websites with information advising customers what actions to take if they encounter a scam.

3. FRAMEWORK FOR TRACKING CYBERCRIME PHISHING USING AI

Below is an overview of a possible framework -

- **Data Collection:** The first stage of the framework involves collecting data on phishing attacks. This can include collecting data on phishing emails, websites, and other related information. Data can be collected using various sources, including public databases, cybersecurity vendors, and online forums.
- **Data Processing:** The collected data needs to be processed and organized for further analysis. This can involve cleaning and structuring the data to ensure it is consistent and accurate. This stage can also involve categorizing the data by various attributes, including the type of attack, the targeted industry, and the geographic location of the attack.
- **AI-Based Analysis:** The processed data is then fed into an AI-based analysis system that uses machine learning algorithms to identify patterns and trends in the data. The AI system can be trained on historical data to identify common characteristics of phishing attacks, including the types of emails, websites, and social engineering tactics used by attackers.
- **Threat Intelligence:** The insights gained from the AI analysis can be used to generate threat intelligence reports. These reports can be used by cybersecurity professionals and law enforcement agencies to better understand the threat landscape and develop effective countermeasures.
- **Response and Mitigation:** The threat intelligence generated from the AI analysis can be used to develop response and mitigation strategies to prevent and respond to phishing attacks. This can include updating anti-phishing tools and implementing awareness training for employees.
- **Continuous Improvement:** The final stage of the framework involves continuous improvement. The framework should be regularly reviewed and updated to ensure it remains effective in tracking and mitigating phishing attacks. This can include updating the AI algorithms, improving data collection processes, and incorporating feedback from cybersecurity professionals and law enforcement agencies.

Implementing such a framework can significantly improve an organization's ability to track and respond to phishing attacks, reducing the risk of data breaches and other cybersecurity incidents.

4. LITERATURE REVIEW

Almomani, A. et.al. (2013) According to this proposal various authors proposes a new framework called Phishing Dynamic Evolving Neural Fuzzy Framework (PDENF). The framework expects to detect and predict unknown "Zero days" Phishing Email with decrease the level of false positive rate of ham email and false negative rate of phishing emails. This is to increase the level of accuracy and increase the performance of classification and prediction the phishing email values in online mode, and long-life working with footprint consuming memory.

Selma, D. et.al. (2015) According to the authors application of AI techniques are already being used to assist humans in fighting cybercrimes, as they provide flexibility and learning capabilities to IDPS (Intrusion detection and prevention system) software. It has become obvious wide knowledge usage in decision making process requires intelligent decision support in cyber defence which can be successfully achieved using AI methods. For future work in enhancing IDPSs, unsupervised learning algorithms and new techniques will be considered together to create hybrid IDPS which will improve the performance of anomaly intrusion detection. Moreover, combining all kinds of AI technologies will become the main development trend in the field of anti-virus technology.

Basit, A. et.al. (2020) The survey enables researchers to comprehend the various methods, challenges and provide a comprehensive and easy-to-follow survey focusing on deep learning, machine

learning, hybrid learning, and scenario-based techniques for phishing attack detection. An efficient detection system ought to have the option to identify phishing attacks with low false positives. With high computational expenses, heuristic and data mining methods have high FP rates, however better at distinguishing phishing attacks. Classification methods such as RF, SVM, C4.5, DT, PCA, k-NN are also common and are highlighted in this paper which are most useful and effective for detecting the phishing attack.

Sharma,P. et.al (2022) According to the Authors the Anti-phishing algorithms have proven very effective in detecting phishing attacks. Technologies developed from these algorithms have proven to be effective in preventing phishing attacks and constantly changing. The prevention is associated with ensuring that the user has been notified of such attacks. The research describes how phishing attacks have been rising for a long time. Detecting phishing attacks through anti-phishing algorithms is an effective approach to protecting most users. Adopting the anti-phishing algorithms across different sectors and technologies will also ensure that the number of phishing attacks has been reduced significantly.

Pingle,Y. et.al (2020) The authors proposed the feature set that can easily classify the URLs, whether it is malicious URL or not. The motive of this technique is to reduce damage caused by phishing attacks and provide better security for personal information. They tested several machine learning algorithms and determined that best classifier was ID3. Their method achieved an accuracy for detecting malicious activity. This technique helps the user to not be a victim of malicious URL. The motive of dividing the project into small modules so that the implementation can be easier.

Basnet,R .et.al(2008) The research insights into the effectiveness of using different machine learning algorithms for the purpose of classification of phishing emails. Soft Computing techniques are increasingly being used to address a gamut of computational problems. The authors employ a few novel input features that can assist in discovering phishing attacks with very limited a-prior knowledge about the adversary or the method used to launch a phishing attack.

T. Chandrakala,et.al.(2020) The authors contributed in writing audit of DM (data mining) and AI applications in the field of criminologists. Four distinct territories of corruption with various seriousness were analyzed through crafted by scientists in the area and their utilization of DM (data mining) to add to bringing down crime percentage through distinguishing, decreasing, or keeping crime from occurring. Various methods of DM (data mining) were likewise utilized at various phases of information assortment, examination, and formation of models.

Singh,P.et.al.(2015) The purpose of this is to prevent the customer from online transaction by using specific technique i.e. based on Data Mining and Artificial Intelligence technique. The risk score is calculated by Bayesian Learning Approach to analyze whether the transaction is genuine or fraudulent based on the two parameters: Customer Spending Behaviour and Geographical Locations. The customer than spending behaviour that can be identified by KMEAN clustering algorithm and in geographical location the current geographical location is compared with the previous location.

Jenkins, A. et.al(2022) The authors here propose a novel phishing-advice tool, PhishEd, which accepts reports from users of potential phishing emails, uses artificial intelligence (AI) to parse out contextual phishing features, and quickly responds back to the user with advice that uses the content of the reported email to explain the reasoning or frame the decision the user needs to make.

Ansari,M.F.et.al.(2022) The paper, showcases the effectiveness of AI-based cyber security training and how it may influence cyber-attacks. AI-based Cyber security awareness ensures that users understand how they can use AI to promote security against phishing attacks. The methods that AI-based Cyber security uses in avoiding Cyber security also ensures users can avoid phishing attacks such as social engineering. This approach ensures that people avoid mistakes which result in them being attacked.

Quest,L.et.al(2018) According to the authors ,Increased use of AI tools for crime prevention could also cause external risks to cascade in unexpected ways. A company could lose its credibility with the public, regulators, and other stakeholders in myriad ways .

Soni,V.D. According to the researcher, it is concluded that artificial intelligence was introduced as a concept to mimic human brains. AI technology is used to enhance customer interaction and experience, enhance the efficiency of banking processes, and develop security and risk control.

Dash,B.et.al(2022) According to the researchers Cybersecurity systems can include AI algorithms to ensure that the response time has increased significantly and that data has remained protected. The author examined that scenario for an intrusion detection machine-learning-based security model. Detection, prediction, and response time skills are among the several features which are discussed here. As a result, businesses and consumers should recognize that establishing a robust defence against cybercrime is best accomplished with AI technology.

5. CONCLUSION

The analysis indicates the need to promote AI-based Cyber security awareness training to prevent phishing attacks. The effectiveness of awareness can be seen in companies' success in engaging their employees in training. The level of security is also promoted through more information on types of AI-based Cyber security that they can implement. More companies have been seen to benefit from this type of awareness. Phishing attacks are shown to have arisen in the past few years. Including the same level of security will ensure that users can prevent phishing attacks on their systems. Cyber security training is therefore important to companies and users in general. The approach ensures that people avoid mistakes which result in them being attacked. Preventing and tracking the phishing attacks using AI-based Cyber security awareness training should therefore be adopted by more organizations, thus reducing the number of global phishing attacks. With all the above selected reviews it is also analysed that AI technologies are very beneficial for the tracking and preventing the cybercrime like Phishing.

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APPLICATION OF MACHINE LEARNING ALGORITHMS IN HEART FAILURE PREDICTION: A REVIEW

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In the recent world heart failure is one of the serious and common reason for the death of peoples. Due to the busy schedule of busy life people do not took more attention on their daily routines and the changes that are happen into the body. It is very important identify the symptoms that will cause of heart failure. Multiple researchers have applied different classification techniques for the prediction of heart failure. In this research we have reviewed more than 40 research articles related to heart failure prediction. After reviewing we came to conclusion that, classification techniques like. KNN, Random Forest have mostly used for the heart failure prediction.

Keywords: Heart Failure, death, KNN, Random forest, Symptoms, Classification,

1. INTRODUCTION

Heart failure is a serious problem which has a huge impact on people's life. With the accelerated pace of life, increased portion sizes and inactivity, most people always ignore their health. Moreover, because of the environmental deterioration, those factors can lead to the issue of heart failure which can become more and more common in the future. If people did not pay attention to the issue of heart failure, it would finally cause death. In the past years, different researchers used different methods to collect and analyse data with the aim to predict heart failure. These data include electronic health record (EHR) data of patients with heart failure in different hospitals from different countries, Cleveland heart disease dataset, biomedical science datasets from UCI, etc. Based on these data, various methods are being applied, e.g., predicting the survival of patients by utilizing classifiers of machine learning, using supervised deep learning and machine learning algorithms, training a boosted decision tree algorithm, utilizing machine intelligence-based statistical model, random under-sampling method and deep neural network models, using bioinformatic explainable deep neural network (BioExpDNN), etc. Soft computing techniques are the best one for the prediction of heart failure. Multiple authors have applied different classification techniques for these purposes. Now a days feature selection techniques are majorly applied to select the relevant features from the data set. The main aim of using feature selection techniques is to improve the accuracy of the results. Hybrid techniques of feature selection and classification are also applied by some of the authors with the aim to find better results. In this research we will also apply this integrated technique for the classification of heart attack prediction.

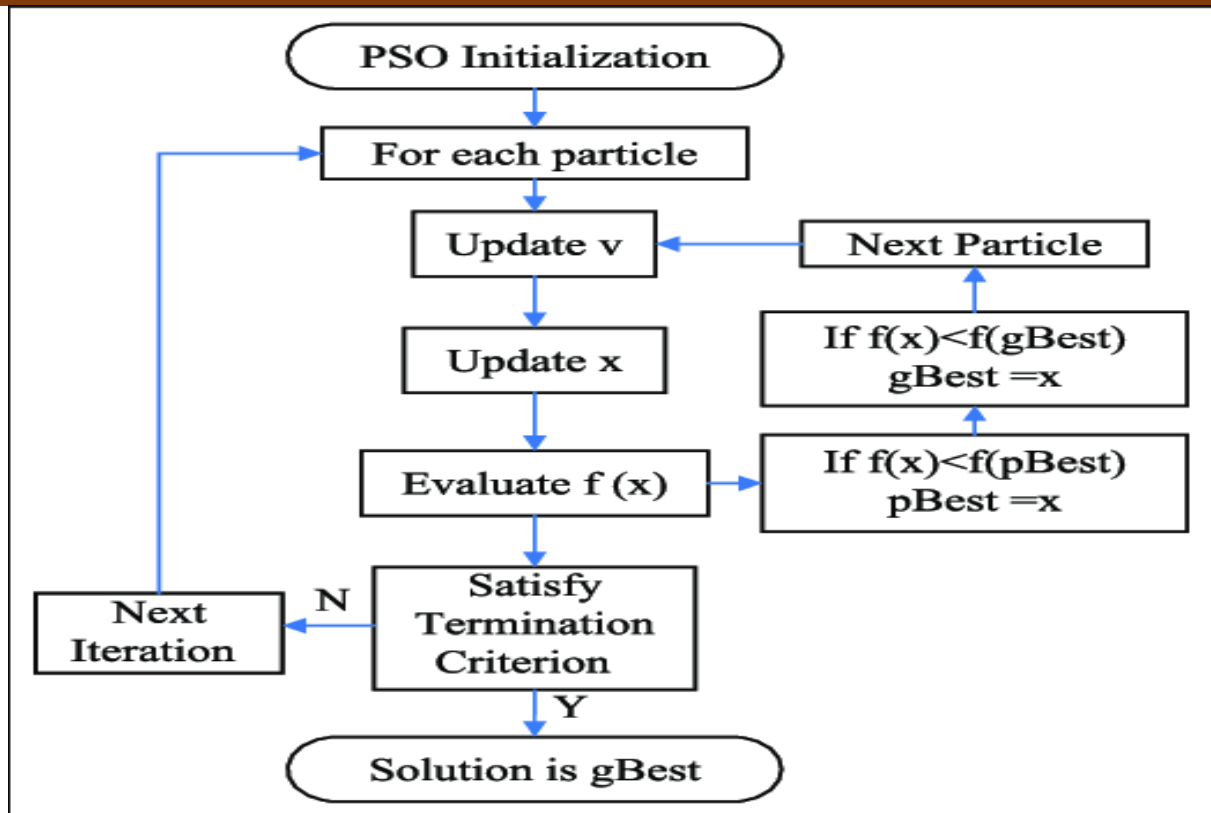


Figure 1: Process of PSO

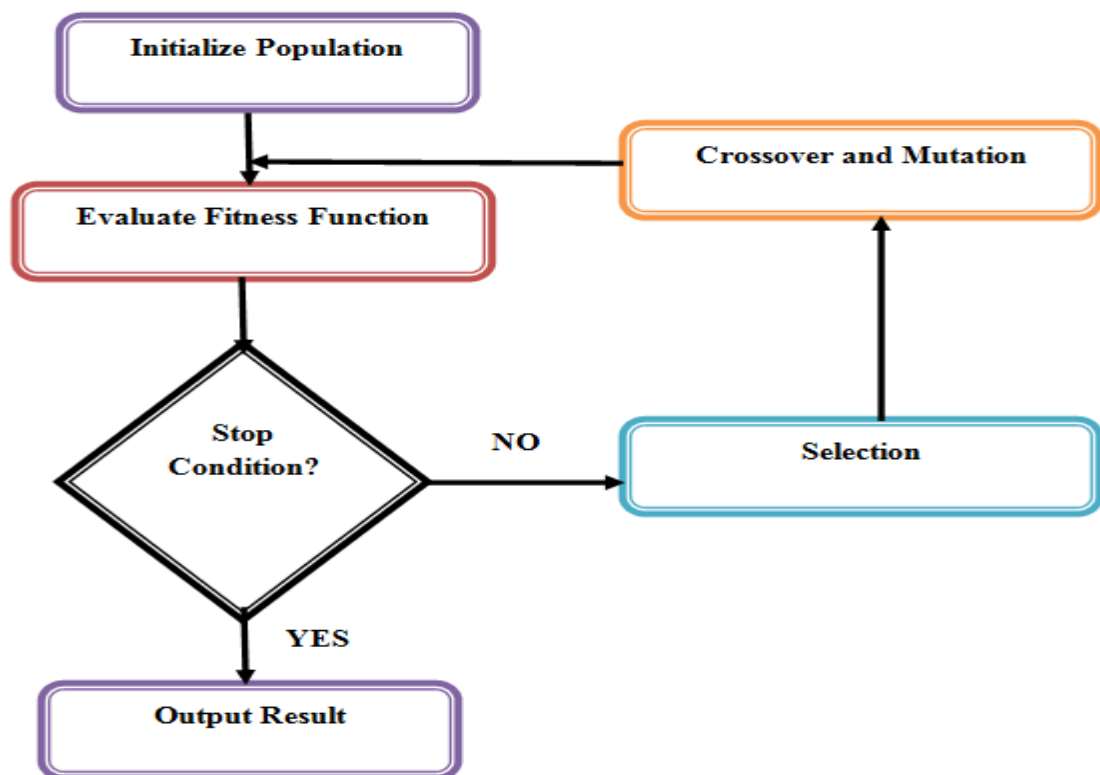


Figure 2: Flow diagram of Genetic Algorithm process

2.LITERATURE REVIEW

In the last few years, many researchers have used various types of machine learning techniques and methods for prediction of heart failure, out of which we are presenting some specific research work here.

Javeed et al. (2022) targets systematic review of automated diagnosis for heart failure prediction based on different types of modalities, i.e., clinical feature-based data modality, images, and ECG. Moreover, this paper critically evaluates the previous methods and presents the limitations in these methods. Finally, the article provides some future research directions in the domain of automated heart disease detection based on machine learning and multiple of data modalities.

The main objective of Sahoo et al. (2022) is to overcome the limitations and to design a robust system which works efficiently and will able to predict the possibility of heart failure accurately. This paper uses the data set from the UCI repository and having 13 important attributes. This work is implemented using many algorithms such as SVM, Naïve Bayes, Logistic Regression, Decision Tree and KNN. It is found that SVM gave the best result with accuracy up to 85.2%. A comparative statement of all the algorithms also presented in the implementation part of the paper. This research also uses model validation technique to design a best suitable model fitting in the current scenario.

Wang J. (2021) presents a comparative study of 18 popular machine learning models for heart failure prediction, with z-score or min-max normalization methods and Synthetic Minority Oversampling Technique (SMOTE) for the imbalance class problem which is often seen in this problem. Our results demonstrate the superiority of using z-score normalization and SMOTE for heart failure prediction.

Pandita et al. (2021) reviews various advancements and recent works that have been done using Machine learning in the prediction of heart diseases. Heart diseases are a result of a multitude of aspects that can influence the cardiovascular health of an individual such as age, blood sugar, blood pressure, cholesterol etc.

Kario et al. (2021) presents Hypertension Research, longterm follow-up results from a real-world registry, Global SYMPLICITY Registry (GSR) Korea, have been published. In addition, the meta-analysis and systematic review of recent sham-controlled clinical trials, including REQUIRE and RADIANCE Trio and the result of patient preference survey in Japan have been released in this issue. Here, the author discuss the clinical implication and perspectives of a RDN-based hypertension management strategy in Asia.

In the paper of Indra Kumari et al. (2020) the risk factors that is used to identify the heart disease like failure is identified and used in the classification. In this research a data set is used with 209 records and 8 attributes like blood pressure, blood glucose level, ECG in rest, heart rate. To predict the heart disease/failure K-means clustering algorithm is used along with data analytics and visualization tool. The paper discusses the pre-processing methods, classifier performances and evaluation metrics. In the result section, the visualized data shows that the prediction is accurate.

Another author Khourdifi et al. (2019) proposed mixed approach is applied to heart disease dataset; the results demonstrate the efficacy and robustness of the proposed hybrid method in processing various types of data for heart failure classification. Therefore, this study examines the different machine learning algorithms and compares the results using different performance measures, i.e. accuracy, precision, recall, f1-score, etc. A maximum classification accuracy of 99.65% using the optimized model proposed by FCBF, PSO and ACO. The results show that the performance of the proposed system is superior to that of the classification technique presented above.

Combining the natural language processing with the rule-based approach, Zhang et al. (2017) and Zhang et al. (2018) achieved 93.37 percent accuracy when the NYHA HF class was found from the unstructured clinical notes.

For reducing the cardiovascular features, Singh et al. (2018) used generalized discriminant analysis for extracting nonlinear features; a binary classifier like an extreme learning machine for less overfitting and increasing the training speed and the ranking method used for all these was Fisher. The accuracy achieved was 100 percent for detecting coronary heart disease.

Rajagopal and Ranganathan (2017) used five different dimensionality reduction techniques which are unsupervised (linear and nonlinear), and neural network is used as a classifier for classifying cardiac arrhythmia. FastICA (used for independent component analysis) with a minimum of 10 components was able to achieve an F1 score of 99.83 percent.

Negi et al. (2016) combined uncorrelated discriminant analysis with PCA so that the best features that are used for controlling the upper limb motions can be selected and the results were great.

Dun et al. (2016) tried various machine learning and deep learning techniques for detecting the heart disease and also performed hyper parameters tuning for increasing the results accuracy. Neural networks achieved high accuracy of 78.3 percent, and the other models were logistic regression, SVM, and ensemble techniques like Random Forest, etc.

For improving the performance electrocardiogram (ECG) approach is suggested by Rahhal et al. (2016), in which deep neural networks are used for choosing the best features and then using them.

For detecting heart failures, a clinical decision support system is contributed by Guidi et al. (2014) for preventing it at an early stage. They tried to compare different machine learning models and deep learning models especially neural networks, as support vector machine, random forest, and CART algorithms. An 87.6 percent accuracy was achieved by random forest and CART, which outperformed everyone used in the classification.

An automatic classifier for detecting congestive heart failure shows the patients at high risk and the patients at low risk by Melillo et al. (2013). They used machine learning algorithm as CART which stands for Classification and Regression in which sensitivity is achieved as 93.3 percent and specificity is achieved as 63.5 percent.

Kamencay et al. (2013) tried a new method for different medical images reaching an accuracy of 83.6 percent when trained on 200 images by using PCA-KNN which is a scale-invariant feature used in medical images for the scaling purpose.

Ratnasari et al. (2013) used a gray-level threshold of 150 based on PCA and ROI, all of these used for reducing features of the X-ray images.

SVM techniques used for detecting patients who already have diabetes and then predicting heart disease by Parthiban and Srivatsa (2012) achieved a 94.60 percent accuracy rate, and the features taken were common like blood sugar level, age of the patient, and their blood pressure data.

Arrhythmias classification was done by Yaghoubi et al (2009). for heart rate variability. A multilayer perceptron neural network was used for doing the classification and 100 percent accuracy is achieved by reducing the features or Gaussian Discriminant Analysis.

Asl et al. (2008) used Gaussian discriminant analysis for reducing the HRV signal features to 15 and 100 percent precision is achieved using the SVM classifier.

3.SUMMARY OF RECENT RESEARCH WORK

Table 1: Summary of recent research work with accuracy for Heart failure

Prediction			
Year	Author(s)	Technique/ Approach	Result (Accuracy)
2022	Javeed et al.	Clinical feature-based data modality, images and ECG	73.8%
2022	Sahoo et al.	SVM, Native Bayes, Logistic Regression, Decision Tree and KNN	85.2%
2021	Wang J.	Z-score, Min-Max normalization, SMOTE	75.2%
2021	Pandita et al.	Machine Learning Algorithms	79.5%
2021	Kario et al.	GSR, RND-BASED	85.5%
2020	Indra Kumari et al.	ECG, K-Mean Algorithm	80.2%
2019	Khourdifi et al.	FCBF, PSO, ACO	99.65%
2017-18	Zhang et al.	NLP	93.37%
2018	Singh et al.	Generalized discriminant Analysis	75.05%
2017	Rajagopal and Ranganathan	Neural Network, Fast ICA	99.83%
2016	Negi et al.	PCA	89.5%
2016	Dun et al.	Machine Learning, Neural Network	78.3%
2013	Melillo et al.	Machine Learning algorithm CART	93.3%
2013	Kamencay et al.	PCA-KNN	83.6%
2013	Ratnasari et al.	Gray-Level threshold, Xray	80.2%
2012	Parthiban and Srivatsa	SVM	94.60%
2009	Yaghoubi et al.	Neural Network	100%
2008	Asl et al.	Gaussian Discriminant Analysis,SVM	75.6%

4. CONCLUSION

Our review study aims to find that There is no any feature selection techniques done in above. In this research we are using two techniques to design a robust system for the prediction of heart failure. One is the feature selection techniques that will use to select relevant feature from the dataset and used classification techniques for predictions.

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MARKETING OBSERVATIONS AFFECTING DEVELOPMENT OF PERSONNEL QUALITY SERVICE IN PROVIDING TO CHINESE TOURISTS IN THAILAND

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ABSTRACT

The objectives of this study were to study 1) marketing mix factors. A sample of 400 subjects was selected by using a questionnaire as a study tool and the collected data were processed using Chi-Square statistical percentage and mean hypothesis testing (Chi-Square) and Multiple Regression Analysis. It was found that most of them were female, aged between 31-40 years old, engaged in personal business/business owners. Bachelor's degree Average monthly income of 35,001 baht or more. Choose to visit natural attractions. during the festival such as New Year's Day, Songkran Day, and make decisions by yourself with preferences. Taste is a perception channel to access public relations media. The average frequency of visiting Thailand is 1.26 times per year and the average cost of traveling to Thailand is 58,605 baht per time. very important level, resulting in Tour operators should focus on products. Tourism programs and activities for Chinese tourists should be organized with a variety of cultural tourism. Set prices that attract tourists during important festivals. Offer special prices during the off season. There are various contact channels to reach the target audience. Processes and service personnel should arrange service providers who are friendly, design services, and facilitate document preparation quickly and easily.

Keywords: marketing mix, Quality Service, Chinese people,

1. INTRODUCTION

At present, China's economy is developing rapidly and continuously expanding in every aspect, causing people to have higher incomes. As a result, people have a better quality of life. For this reason, the Chinese therefore traveling abroad more From the statistics of the number of Chinese outbound tourists in the past decade Since 2013, China has maintained its status as a country of origin with large outbound tourists. by the end of 2017, there were a total of 13,051 million outbound tourists, up from the 2018 China Tourism Administration Information Center survey and summary, when Traveling to foreign countries, most Chinese tourists choose to visit countries in Asia, followed by countries in Europe. by almost half of Chinese tourists visiting (Angus, 1998)

Nowadays, the tourism industry is an industry that is important to the economic development of countries around the world, especially Thailand. Tourism is the main industry that generates income for The country is the top It also helps to develop and improve people's quality of life, which leads to the creation of jobs and income distribution to other business sectors. The tourism industry is important for driving the country's economy. for trends and situations Tourism of Thailand found that in 2015, there were 29.9 million foreign tourists visiting the country, which is the 11th largest in the world, and the growth rate has continued to increase over the past 4 years. In the past, and in 2018-2022, it is estimated that the number of foreign tourists is not less than 10 percent per year. Mass tourism focuses mainly on the satisfaction of large groups of tourists. Development of alternative tourism (Alternative Tourism) (Young, Fang, & Fang, 2009)

From the above information, the researcher is interested in studying the marketing mix factors affecting the behavior of Chinese tourists traveling to Thailand. to apply the results of the study as a guideline for the development of tourism business in Thailand

2. STUDY OBJECTIVES

To study the marketing mix factors of Chinese tourists traveling to Thailand to study the behavior of Chinese tourists traveling to Thailand. To compare the behavior of Chinese tourists traveling to Thailand classified by personal data to study the marketing mix factors affecting the behavior of Chinese tourists traveling to Thailand. (Choibamroong, 2017)

3. HHYPOTHESIS

- Different personal data has different behaviors of Chinese tourists traveling to Thailand.
- Marketing mix factors influence behavior of Chinese tourists traveling to Thailand.

4. SCOPE OF STUDY

Content: A study of marketing mix factors affecting behavior of Chinese tourists traveling to Thailand. Based on Philip Kotler's 7P's Theory of Marketing Mix, which consists of Product (Price) , Distribution Channel (Place) , Promotion , Personnel (People) , Process (Process) and Physical and Presentation (Physical) evidence) Demographics The sample group used in the study was 400 Chinese tourists. (Kusumawati, Oswari, Utomo, & Kumar, 2014)

5. CONCEPTS, THEORIES AND RELATED RESEARCH

study subject Marketing mix factors affecting behavior of Chinese tourists traveling to Thailand The student has studied documents, concepts, theories and related research. to be used to formulate the conceptual framework and guidelines for the study as follows:

6. COMPONENTS OF THE MARKETING MIX

There are basically four marketing mixes: product, price, distribution channel. and marketing promotion, but the marketing mix of the service market is different from the marketing mix of general products, namely There has to be an emphasis on employees. The process of providing the service and the physical characteristics of which these three components are the main factors in the delivery of the service. Therefore, the service marketing mix consists of the 7 Ps: product, price, distribution channel. Promotion of marketing, people, processes and physical characteristics as follows The product (Product) is something that can meet the needs and needs of human beings. What the seller has to offer to the customer and the customer will receive the benefits and value of that product. Generally, products are divided into two types, namely Tangible Products and Intangible Products. (Kotler, Keller, Ang, Tan, & Leong, 2018)

Price refers to the value of a product in monetary terms. The customer compares the value (Value) of the service and the price (Price) of that service. If the value is higher than the price, the customer will decide to buy. Therefore, the service pricing should be clearly appropriate for the level of service. And it is easy to classify different service levels. (Kang, & Gardner,1989)

The distribution channel (Place) is an activity related to the environment in the presentation of services to customers. This affects the customer's perception of the value and benefits of the services offered. which must be considered in terms of location (Location) and channels in offering services (Channels) (Kale, & McIntyre, 1991)

Marketing promotion (Promotion) is one of the tools that are important in communicating to users. with the objective of informing or influencing attitudes and behaviors The use of services and is the key of relationship marketing. (Henriksen, 2012)

Personnel (People) or employees (Employee), which requires selection, training, motivation in order to be able to create satisfaction for customers differently than competitors. The relationship between service personnel and service users of the organization. have an attitude that can respond to service

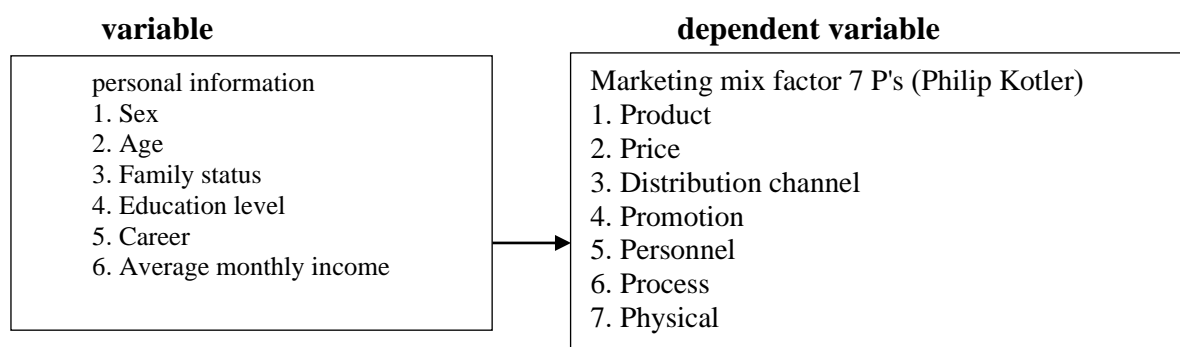
users initiative have the ability to solve problems can create values for the organization (Trompenaars, & Voerman, 2009)

The process (Process) is an activity that is related to the methodology and practice of service. presented to the service user in order to provide the service accurately and quickly and make the service user impressed (Jolson, & Rossow, 1971).

Physical appearance and presentation (Physical Evidence/ Environment and Presentation) is to demonstrate physical characteristics and present to customers in a concrete way. by trying to build overall quality both in terms of physical characteristics and service styles to create value for customers whether it's in terms of dressing clean and neat Negotiation must be gentle. and fast service or other benefits that customers should receive from the marketing mix The above 7 things are important to formulate various marketing strategies of the business. To have each mix to be appropriate for the environment of different businesses and industries, there is no fixed formula. (Kotler, 2000)

7. CONCEPTUAL FRAMEWORK IN EDUCATION

From the above study The study was based on 7P's marketing mix factor theory and consumer behavior theory. Summarize and coordinate into a conceptual framework to study the factors of marketing mix that affect the behavior of Chinese tourists traveling to Thailand as follows:



8. RESEARCH METHODOLOGY

A study of marketing mix factors affecting behavior of Chinese tourists traveling to Thailand. It is a quantitative research. (Quantitative Research) by using survey research (Survey Research) through data collection via questionnaires. (Questionnaire) and data analysis by statistical methods with a package of research results. It is divided into steps as follows:

9. RESOURCES

There are two types of data sources in this study. Primary data is the data obtained from the questionnaire of Chinese tourists traveling to Thailand and the secondary data is the data obtained. from textbooks, educational reports, research papers, and related documents and information from the Internet

10. POPULATION AND SAMPLES USED IN THE STUDY

The population used in the study were Chinese tourists traveling to Thailand.

A total of 400 samples were selected for this study. W.G.Cochran (Cochran, 1954) unidentified sample size was calculated at the 95% confidence level as follows:

$$n = P (1-P)(Z^2) / (e^2)$$

$$n = (.50)(1-.50)(1.96^2)/(.05^2) \quad n = (.5)(.5)(3.8416)/.002 \quad n = .9604/.002 \quad n = 384.16$$

In the calculations, 3 8 5 samples were obtained, but in order to prevent mistakes that may occur in answering the questionnaire Incomplete Information The researcher therefore used a sample of 400 people.

11. RESEARCH TOOLS

The tools used in this study, the researcher used the questionnaire as a tool for data collection by the study authors. The steps were created as follows: the procedure for creating the tool for creating the tool used in this study created a questionnaire (Questionnaire) which has taken the following steps to study related theories and concepts including principles and methods for creating research questionnaires as well as formulating research concepts By receiving advice from the advisor, study the information from books, documents, articles and related research to be used as a guideline for creating questions, determining the issues and scope of the questions in accordance with the objectives. Concepts and theories used in the research work to create a draft questionnaire and present the created questionnaire to the advisor. To check and make additional suggestions for improvement in the parts that are not yet complete Complete the questionnaire improvements. According to the advisor suggested the questionnaire which has been revised to 3 experts to check the content validity (Content Validity) to improve the questionnaire according to the recommendations of the experts. Present to an advisor for re-examination and complete revision. Before being used for further data collection, the revised questionnaires as suggested by experts were used and try-out with a group that was similar to the sample group of 40 people. through analysis Classified and analyzed for confidence. (Reliability) by finding Cronbach's alpha coefficient.

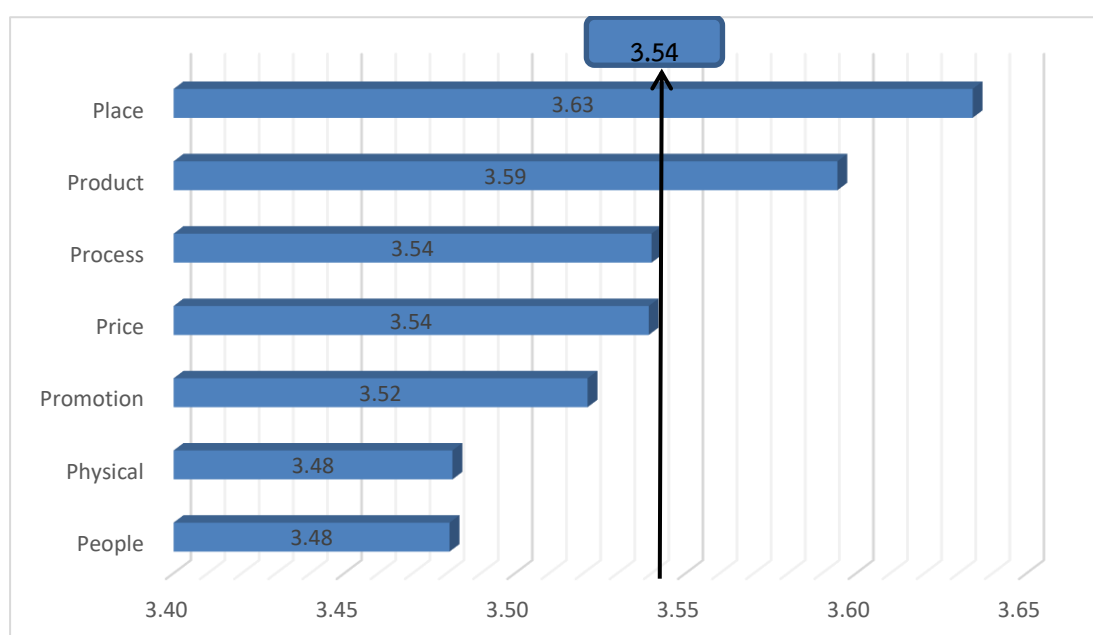
12. METHODS FOR COLLECTING DATA

in order to complete the study. There is a method for collecting data. The following information is gathered from studies from various sources, including textbooks, documents, and other relevant research results. and get it back by yourself Conduct a complete check This ensures that the questionnaire is complete, complete and can be used for further analysis.

13. STUDY RESULTS

The study of marketing mix factors affecting behavior of Chinese tourists traveling to Thailand Examples of this study were Chinese tourists traveling to Thailand. 400 sets of questionnaires were used as a data collection tool, and 400 were returned, representing 100% of the questionnaire. The results of the study were divided into 5 parts as follows:

14. OVERALL MARKETING MIX FACTORS



Shows the importance of marketing mix as a whole from the study of data. The importance of the marketing mix as a whole The average was included on the high priority level (= 3.54) and

when considering the level of importance 5 items were in high priority, consisting of distribution channel marketing mix (= 3.63) product marketing mix (= 3.59) service process marketing mix (= 3.54) price marketing mix (= 3.54) The marketing mix in the marketing promotion (= 3.52) was in the high priority level, 2 items consisted of the marketing mix of physical characteristics (= 3.48) and the marketing mix of personnel (= 3.48), according to number

Show marketing mix factors influence behavior of Chinese tourists traveling to Thailand.

Marketing Mix	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	1.319	.137		9.623	.000
Product	.029	.031	.050	.944	.346
Price	.061	.030	.123	2.071	.039*
Chanel of distribution	-.034	.033	-.072	-1.025	.306
Promotion	.031	.036	.066	.846	.398
personal	-.015	.033	-.034	-.464	.643
Process	-.008	.032	-.019	-.263	.793
Physic	.040	.031	.087	1.310	.191

*significant level.05**significant level.01

Comparison of influence of marketing mix with behavior of frequency of Chinese tourists visiting Thailand. It was found that behavior and price-related marketing mix (Sig = 0.039) had a statistically significant influence on the behavior of Chinese tourists traveling to Thailand.

14. RESULTS, DISCUSSION AND RECOMMENDATIONS

study subject Marketing mix factors affecting behavior of Chinese tourists traveling to Thailand The objective of this research was to study the marketing mix factors of Chinese tourists traveling to Thailand. Study the behavior of Chinese tourists traveling to Thailand. Compare the behavior of Chinese tourists traveling to Thailand and study the marketing mix factors affecting the behavior of Chinese tourists traveling to Thailand. 400 questionnaires were used as data collection tools and statistical data were analyzed such as percentage, mean, Chi-square hypothesis test and Multiple Regression Analysis.

The results of the data analysis can be summarized as follows:

15. PERSONAL INFORMATION

from the study of Marketing mix factors affecting behavior of Chinese tourists traveling to Thailand It was found that most of the respondents were female, aged between 31-40 years old, engaged in personal business/business owners. Most of them have a bachelor's degree with an average monthly income of 35,001 baht or more.

16. INFORMATION ON THE IMPORTANCE OF MARKETING MIX FACTORS

From the study, it was found that the overall marketing mix factors were at a high level, consisting of products, prices, distribution channels. Promotion of marketing, personal

17. PROCESS PHYSICAL APPEARANCE THE DETAILS ARE AS FOLLOWS.

Distribution The overall results of the study were at a very important level. The important details are as follows. 3 items are in a very important level, consisting of being able to book travel programs and accommodation and accommodation via the internet and able to book travel programs and accommodation through tour companies, respectively.

product side The overall results of the study were at a very important level. The important details are as follows. 3 items are in a very important level, consisting of a variety of tourism activities. beautiful cultural arts The adequacy of the accommodation is in 2 items of medium importance. The beauty of the tourist attraction. and the identity of the tourist attractions, respectively

Process The overall results of the study were at a very important level. The important details are as follows. It is in a very important level, 2 items, consisting of the process of entering Thailand is not difficult, traveling to various tourist spots, convenient and safe It is in a very important level, 1 item is receiving advice on useful and interesting tourist attractions, respectively.

In terms of price, the overall results of the study were at a very important level. The important details are as follows. In the level of very important 2 items, consisting of inexpensive product prices. The cost of living in tourist attractions is not high and is of moderate importance. One item is a cheap tour package, respectively.

marketing promotion The overall results of the study were at a very important level. The important details are as follows. Two items are of high importance. There are promotions from tour companies. There are recommendations about new attractions. There are two items of high importance: to organize festivals and large events to promote attractive tourism. And there are promotions from hotels and airlines, respectively.

physical appearance The overall results of the study were at a moderately important level. The important details are as follows. It is in a very important level, 1 item is that the attractions are beautiful and comfortable. It is in 2 very important levels. Traveling is convenient and safe, and accommodation is comfortable. and complete facilities, respectively

As for individuals, the overall results of the study were at a moderately important level. The important details are as follows. It is in a very important level, 1 item is the general public at the tourist attraction is polite. beaming 2 items were of medium importance: the reception in various places was polite, gentle, friendly, and the general public at the sights was polite. smiling in order

18. BEHAVIOR OF CHINESE PEOPLE WHO COME TO TRAVEL IN THAILAND

From the study, it was found that the Chinese respondents' travel behavior in Thailand The accommodation that many Chinese use is staying at the places that the tour company's program operates. Most of them are the type of places that Chinese people tend to choose, namely natural attractions. The time to travel to Thailand is during festivals such as New Year's Day, Songkran Day, the person influencing the decision is to make the decision by yourself. The reason for deciding to travel in Thailand is preference, taste, perception of access to public relations media, namely social media such as Wechat, Sina, with average frequency of visiting Thailand at 1.26 times per year and The average cost of traveling to Thailand is 58,605 baht per visit.

19. DIFFERENT PERSONAL DATA OF CHINESE PEOPLE'S BEHAVIOR IN TRAVELING IN THAILAND DIFFERENT

Hypothesis 1 : Different personal factors of Chinese people affect their travel behavior in Thailand. Different personal data about different genders of Chinese people affect their travel behavior in Thailand. different In terms of public relations media channels that are recognized Different personal data, gender, different Chinese people have different travel behaviors in Thailand. In terms of accommodation that you choose to use the service The type of tourist attractions in Thailand that you often choose The time period that you come to travel to Thailand Persons that influence decision making and the reasons for choosing to travel in Thailand that is no different The age difference of Chinese personal data affects the travel behavior of the accommodation that you choose to use. The type of tourist attractions in Thailand that you often choose The time period that you come to travel to

Thailand Persons that influence decision making and in terms of public relations media channels that are perceived differently, personal information about different ages of Chinese people have different travel behaviors in Thailand In terms of the reasons for the decision to choose to travel in Thailand that are not different, the personal information of different occupations of the Chinese people, the behavior of traveling in Thailand In terms of accommodation that you choose to use the service The time period that you come to travel to Thailand The reasons for choosing to travel in Thailand different Personal data about different occupations of Chinese people's behavior in traveling in Thailand In terms of the types of tourist attractions in Thailand that you usually choose, the aspect of people influencing decision-making and media channels that are perceived as different, personal information, educational level, different Chinese people have different behaviors. come to travel in Thailand In terms of accommodation that you choose to use the service The type of tourist attractions in Thailand that you often choose In terms of the time of your visit to Thailand, the person who influenced the decision on the reasons for choosing to travel in Thailand and in terms of public relations media channels that do not differ in perception of personal information on average monthly income of different Chinese people's travel behaviors in Thailand The types of tourist attractions in Thailand that you often choose to go to and the reasons for choosing to travel in Thailand are different.

Personal data about different occupations of Chinese people's behavior in traveling to Thailand in terms of accommodation that you choose to use. The time period that you come to travel to Thailand The people who influenced decision making and the media channels perceived were not different.

20. MARKETING MIX FACTORS INFLUENCE BEHAVIOR OF CHINESE TOURISTS TRAVELING TO THAILAND.

Hypothesis 2: Marketing mix factors influence behavior of Chinese tourists traveling to Thailand. Marketing mix factor, price, affecting behavior of Chinese tourists traveling to Thailand. at 0.05 level of statistical significance

21. DISCUSSION OF THE RESULTS OF THE RECOMMENDATIONS OBTAINED FROM THE STUDY.

The study's recommendations are as follows: From the research, it was found that Chinese tourists are of the working age who are self-employed or self-employed. As a result, they have the power to decide to come and travel in Thailand by themselves. Tourist attractions that often get attention, whether it is natural attractions, artistic places such as Wat Phra Kaew. performing arts venue such as the Cabaret show Or night attractions such as Khao San Road are interesting at a similar level, so that if companies involved in tourism Or organizing a tourism program in Thailand should pay attention to the development of tourism plans, activities plans, accommodation facilities. tourist service plan to suit the price of the tour package And the price is still affordable for tourists. And there are campaigns to organize to attract tourists to spread in tourism in various places.

22. SUGGESTIONS FOR THE NEXT STUDY

In the next study, the factors affecting the satisfaction of Chinese tourists visiting Thailand should be studied. for gaining insights to develop and build confidence in a good image for tourism in Thailand

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MARKETING MIX FACTORS AFFECTING TO THE LOYALTY OF THAI BRAND FRESH COFFEE SHOP

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The study of Marketing Mix Factors Influencing Thai Brand Fresh Coffee Shop Loyalty which aimed to study the marketing mix factors in using Thai brand fresh coffee shop, to study the level of loyalty to Thai brand fresh coffee shops, to compare loyalty to Thai brands of fresh coffee shops by demographic information and to study the marketing mix that affects loyalty to Thai brands of fresh coffee shops. The population in the study was customers who came to use Thai brand coffee shops. The data collected from sample of 400 people by using questionnaires as a study tool and using percentage, mean and t-test statistics, F-test (One-way ANOVA) and Multiple Regression Analysis. The study found that the majority of respondents were female, aged 41 to 50, with bachelor's degree single status, with an average monthly income of more than 35,000 baht, and employed private company employees. Moreover, Marketing mix factors in using Thai brand fresh coffee shops and level of loyalty to Thai brand fresh coffee shops in overall significance average was at very high. The hypothesis test shown that consumers with different genders, ages, marital status, levels of education, and occupations had loyalty to fresh cafes, Thai brands without difference. Whereas consumers with different average monthly incomes had different loyalty to , Thai brand fresh coffee shops with statistically significant at the level of .05. And market mix factors included price and physical evidence influenced the loyalty of Thai brand fresh coffee shops with statistically significant at the level of .05.

Recommendations from the results of the study Entrepreneurs should pay attention to having a wide selection of coffee menus, retain the quality of the coffee flavors of Thai brands with aroma to concentrate retains its distinctive and exotic uniqueness, choose containers and packaging that create more interesting, set the price of the product to be suitable for quality, provide several prices based on the features and size of the package, attach a clear price tag for the product, choose a distribution location with adequate parking and ease of access, select staff who provide friendly service and deliver products quickly and accurately, decorate the shop to be more modern and cleaner and the atmosphere in the shop should be unique of Thai, provide adequately allocate seats inside and outside the shop and set up a place for photography to be shared on social media as a way to communicate and recognize the shop widely.

Keywords: Marketing Mix Factor, Loyalty, Thai Brand Coffee Shop

1. INTRODUCTION

Coffee as a beverage that brings happiness to consumers around the world. Coupled with simultaneous economic growth, the coffee industry creates opportunities and improves livelihoods for over 25 million coffee farmers around the world. Especially coffee farmers in Africa. Latin America South America and ASEAN countries as well as creating economic income for those in the

global value chain of coffee production, whether businessmen, roasters, retailers and employees or other stakeholders. Since 1990, the global coffee chain has expanded exponentially. As production increased by more than 65 percent, the main driver of the growth of the coffee industry was increased consumption in emerging countries and the coffee producing countries themselves. Including demand in traditional markets that already have a high population demand. In addition, consumer demand has increased further from high-value market segments such as organic coffee. Or specialty coffee (Specialty Coffee) that is the result of innovation that gives coffee products new flavors. help meet the needs And more convenient for consumers, making the coffee business tend to grow higher As a result, the global demand for coffee continues to increase (Clarke, & Vitzthum, 2008)

Even in the year 2021, the "coffee market" has been affected by the COVID-19 situation. As a result, the total coffee market in Thailand is stable, not growing and not decreasing. Because if you want to classify the coffee market with a total value of 60,000 million baht, this can be divided into a home coffee market of 33,000 million baht that has benefited from COVID-19, growing about 10%. That changed during the COVID When the two parts are combined, it is the reason for the coffee market to remain stable. (Hernandez, Pandolph, Sanger, & Vos, 2020)

While looking deeper at out-of-home coffee, among them, the market value of coffee shops is about 17 billion baht, which will continue to grow due to the trend of coffee shops that have not decreased. and consumer behavior that wants a place to meet Including wanting to drink coffee that is more than the general menu can be seen from many new coffee shops, such as small shops that focus on specialty coffee shops Using a strategy with the atmosphere of a beautifully decorated restaurant And have a specific menu that attracts consumers to use the service at the same time that big brands that are strong in that market also find strategies And accelerate the expansion of branches to support the coffee drinking trend of consumers as well (Giovannucci, 2001)

At the beginning of the year 2021, it was found that Cafe Amazon has gained up to 40% of the coffee market share of the coffee shop market and has the number one sales in Thailand. By using a strategy for customers of all genders and ages to expand branches from now on for the next 5 years, in 2025, it is expected that there will be up to 5,800 Caf Amazon coffee shops from more than 3,400 currently. both in Thailand and abroad From what has been said, the researcher has an opinion that The trend of investing in the coffee shop business has received a lot of attention. and want novelty or differences in different forms, but there are many competitors Therefore, the researcher is interested in studying the marketing mix factors that influence the loyalty of freshly brewed Thai coffee shops. (Limna, Siripipathanakul, & Phayaphrom, 2021) To use the results of the study as a guideline for the coffee shop business in Thailand. and services that responds to the behavior and needs of consumers To maintain and build loyalty to Thai coffee brands to be able to respond to the needs of Thai coffee even more in the future (Jia,2014)

2. OBJECTIVES OF THE STUDY

To study the marketing mix factors in using the service of fresh coffee brands in Thailand. To study the level of loyalty towards fresh coffee brands in Thailand. To compare the loyalty of fresh coffee brands in Thailand classified by personal data. To study the marketing mix that affects loyalty to Brand Thai coffee shops.

3. HYPOTHESIS

- Different personal data affects loyalty to different Thai brand fresh coffee shops.
- Marketing mix factors influencing loyalty to Thai brand fresh coffee shops

4. CONCEPTS, THEORIES AND RELATED RESEARCH

Coffee is a native plant of Abyssinia and Arabia, which was discovered in the 5th century in Arabia at that time. No one paid much attention. Until the late 9th century, an Arabian goat herder named Kaldi (Kaldi) brought goats out to feed. and the goat ate the fruit and the coffee leaves. causing abnormal frenzy Kaldi has brought the story to tell one of the Muslims. That Muslim then collected the coffee berries, cracked the coffee beans, roasted them and boiled them in hot water to drink. The Arabians therefore got to know more about the coffee tree. Causing coffee to spread from Arabia to the people of Italy, Dutch, German, France and the coffee production process has developed steadily. In the later stages, the country that is most famous for producing coffee is Brazil. 72 % of global coffee production which is considered to produce the most The countries that buy the most coffee are the United States and Europe, about 85 percent of the world's production.

5. MARKETING MIX THEORY

The definition of marketing mix is defined as A harmonious combination of pricing. promotion Products offered for sale and distribution system Which has been designed to be used for reaching the desired consumer group.ⁱ

6. CONCEPT OF MARKETING MIX

Kotler and Keller (2016) ¹gave the idea that the marketing mix of the service market is different from the general product marketing mix. There must be an emphasis on employees. The service process and the physical environment in which the three ingredients are key factors in service delivery. Therefore, the service marketing mix consists of the 7Ps: product, price, distribution channel. marketing promotion, people, service process and physical environment as follows

6.1 Product side Products refer to what the company offers and sells to create interest. by consuming or using the service; can make customers satisfied by satisfaction that may come from tangible or intangible things such as packaging form, smell, color, price, brand, product quality Reputation of the manufacturer or distributor

6.2 Price

Price means the amount of money that must be paid in order to obtain the Product. The entity's goods and/or services, or may be all of the value that the customer perceives in order to obtain a benefit from the use of the product. That product or service is worth the money spent. Including the value of the product in terms of money It is used by customers to compare between the price that they have to pay and the value that customers will receive in return from that product. Customers will make purchase decisions. Businesses should therefore take into account the following factors while formulating pricing strategies:

6.3 distribution channels

Distribution channels refer to channels for the sale of goods or services including methods to bring those goods or services to consumers in order to keep up with demand. who is And how should products or services be distributed to consumers through which channels would be most appropriate? McCarthy & Perreault (2015) explained that distribution channels In other words, choosing a location for your business is very important. especially the service business Because the location chosen by the business determines the group of customers who will come to use the service. Therefore, the property should cover the area to serve as many target groups as possible. And the location will be more or less important depending on the nature of each type of business. As for the determination of distribution channels, the nature and form of business operations must be taken into account, the need for intermediaries. to distribute products or services of a business and customers who are the target group of the business

6.4 Marketing Promotion

Marketing promotion means a marketing communication tool. To create motivation, thoughts, feelings, needs and satisfaction in products or services. This will be used to persuade target customers to demand Jai Dao, similar or to remind the product itself. It is expected that marketing promotion will influence feelings, beliefs and buying behavior of products or services. or it may be communication to exchange information between sellers and buyers There must be a combination of different forms of marketing communication tools. Armstrong and Kotler (2016) or can be called an integrated marketing communication tool. Which will use the tool in any form It will also depend on the suitability of the target customer group. The tools used to promote integrated marketing consist of 5 main tools as follows (Jitika Koomruen, 2016)

6.5 Person

Personnel refers to employees who work for the benefit of various organizations, including the owner of the business. senior management middle management lower level management general staff, housekeepers, etc. (Armstrong and Kotler, 2016). Personnel can be considered as a marketing mix. sensitive Because he thinks, plans and works. To drive the organization in the direction that the strategy has been set. or is it an interaction And building goodwill towards customers which is important to make customers satisfied and create a long-term relationship with the organization.

6.6 Physical aspect

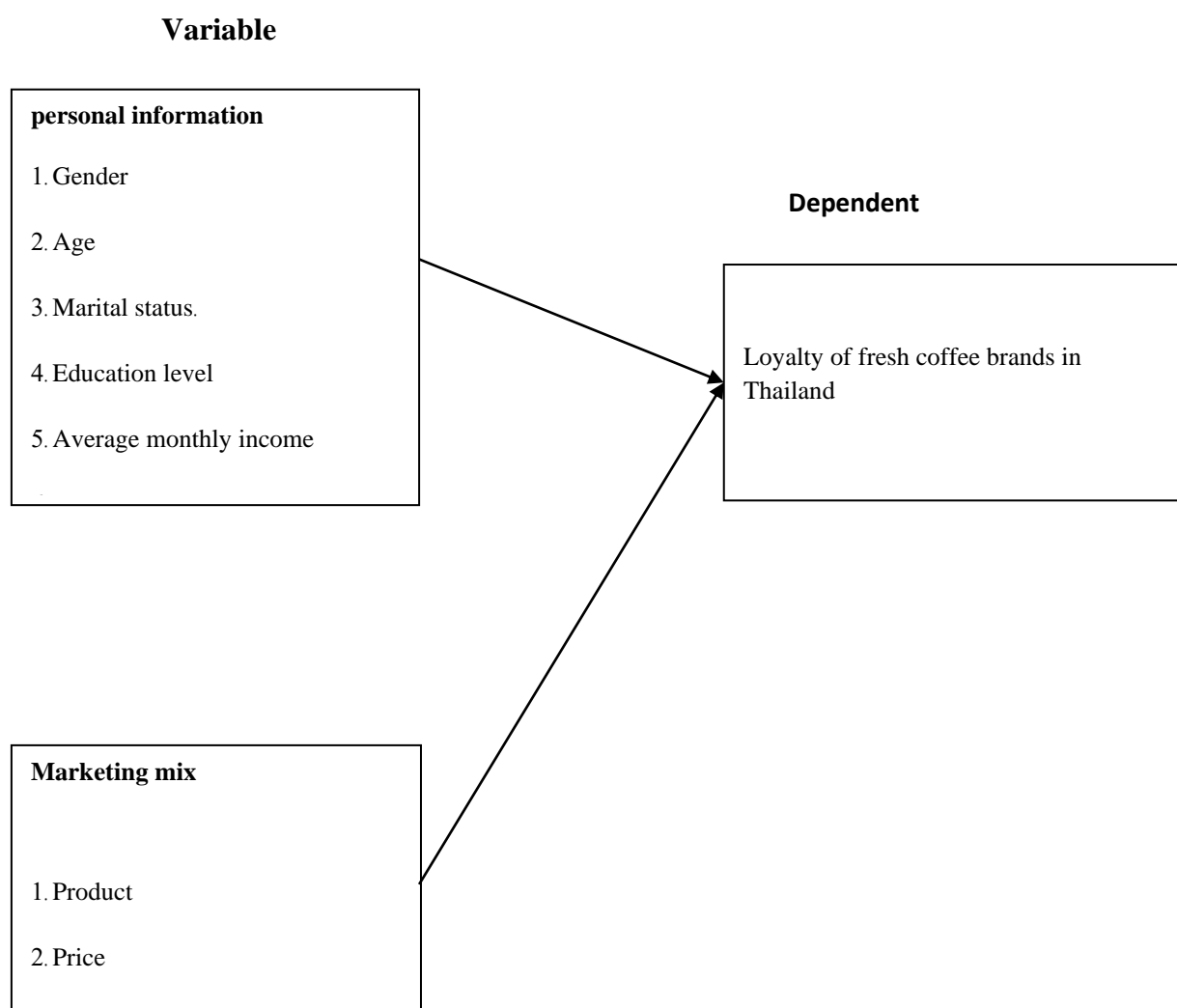
Physical characteristics refer to what customers can experience from choosing products. or corporate services It creates a distinctive and quality difference, such as the decoration of the shop. style of food arrangement The dress of employees in the store, speaking to customers, fast service, etc. These things are necessary for business operations especially in the service business that should create quality. as a whole That is, in terms of the physical condition that the customer can see. The physical characteristics that the customer gives satisfaction and the novelty of the physical condition that is different from other service providers. Like Ong-ard versus that said Physical appearance is something that customers can touch and touch while still using the product or service. It may also mean A sign that the customer understands what it means to receive information from public marketing communications.

6.7 Process

Process means activities related to methods and practices in the field of services presented to service users. to provide accurate and fast service In each process there can be many activities. According to the form and method of operation of the organization, if the activities within the process are linked and coordinated. will make the overall process efficient As a result, customers are satisfied (Armstrong and Kotler, 2016) . so that all employees within the organization have the same understanding can act in the same direction correctly and smoothly

7. CONCEPTUAL FRAMEWORK

From the above studies, the researcher concluded and combined into a conceptual framework for studying the marketing mix factors influencing loyalty to Thai branded fresh coffee shops as follows:



8. RESEARCH METHODOLOGY

The study of marketing mix factors influencing loyalty to Thai brand fresh coffee shops aims to study the marketing mix factors in using Thai brand fresh coffee shop services. Loyalty level for fresh coffee brands in Thailand Loyalty Comparison of Fresh Coffee Brands in Thailand Classified by Personal Data Marketing Mix Factors Affecting Loyalty towards Thai Branded Fresh Coffee Shops The study method was determined as follows:

8.1 Resources used in the study

There are 2 types of data sources in this study. Primary Data is the data obtained from questionnaires to collect data from customers who choose to use Thai brand coffee shops. in Bangkok by being a respondent Secondary Data is information obtained from textbooks. Study reports, related documents and internet

8.2 Population and samples used in the study

The population used in the study was

The sample group used in the study was a sample group of customers who chose to use Thai coffee brand coffee. In Bangkok, 400 samples were obtained from the sample calculation formula of W.G.cochran (1963).

$$n = P(1-P)(z)^2/(e)^2$$

$$n = (.5)(1-.50)(1.96)^2/ (.05)^2$$

$$n = (0.5) (0.5) (3.8416)/.0025$$

$$n = 0.9604/0.0025$$

$$n = 384 .16$$

In the calculation, there will be a sample of 385 people, but in order to prevent errors that may occur in answering the questionnaire. The information is incomplete. The study therefore used a sample group of 400 samples, where the researcher chose to use random sampling as convenient.

8.3 Method of data collection

In order to complete the study, there are methods for collecting data as follows: Data collected from Study and research from various sources, including textbooks, documents and other research results. related information obtained from Answering the questionnaire of the target group and get it back on your own Carry out checks To ensure that the questionnaire is complete and complete and can be used for further data analysis.

8.4 Data processing and analysis

The data obtained from the questionnaire was processed by a computer program by finding the percentage ratio (Percentage) and the mean (Mean) program Microsoft Excel, which is a ready-made program for creating pie charts (Pie Chart) and bar charts (Bar Chart) with words. explain the result And the results from the chart are presented for analysis according to the characteristics of the variables.

8.5 Statistics used to analyze data

Descriptive Statistics Statistics used are percentages (Percentage) and mean (Mean) to describe demographic data of respondents and variables.

Inferential statistics were used for hypothesis testing. Statistics used were t-test, ANOVA analysis, F-test (One-way ANOVA) and Multiple Regression Analysis.

9. RESULTS OF RESEARCH

study of The marketing mix factors influencing the loyalty of freshly-branded Thai coffee shops The sample group was 400 customers who came to use the service of Thai-branded coffee shops by using 400 questionnaires as a data collection tool and received returns. Amount 400 sets, representing 100% of the questionnaire

Table 1: Analysis of marketing mix factors influencing loyalty to Thai brand fresh coffee shops.

Marketing mix	B	Std. Error	Beta	t	Sig.	Test
(constant value)	1.241	.221		5.626	.000	
1) Product	.059	.053	.062	1.131	.259	no
2) price	.208	.058	.213	3.610	.000*	yes
3) Channels of distribution	.033	.062	.035	.529	.597	no
4) promotion	.088	.050	.117	1.772	.077	no
5) personal	-.020	.075	-.020	-.267	.789	no
6) process	.046	.086	.046	.532	.595	no
7) physical	.252	.081	.247	3.121	.002*	yes

* Statistical significance at the 0.05 level (2-tailed).

The results of data analysis using multiple regression equations showed that the price aspect and the physical characteristics aspect Influencing the loyalty of fresh coffee brands in Thailand Statistically significant at the 0.05 level.

10. SUMMARY, DISCUSSION, AND RECOMMENDATIONS

The study of marketing mix factors influencing fresh coffee brand loyalty to Thai coffee shops was aimed at studying the marketing mix. loyalty level Compare Loyalty by Personal Data and marketing mix factors affecting loyalty to Thai brand fresh coffee shops. A questionnaire of 400 sets was used as a tool for collecting data and statistical analysis was used for frequency, percentage, mean, t-test. F-test (One-way ANOVA) and Multiple Regression Analysis From the data analysis results can be summarized as follows. personal information It was found that most of the respondents were female,

aged between 41 and 50 years old, bachelor's degree in bachelor status. have an average monthly income of more than 35,000 baht and work as employees of private companies

11. DISCUSSION OF RESULTS, RECOMMENDATIONS FROM THE STUDY

Twenty-four respondents said that other factors affecting loyalty were the service provided by employees who were friendly, courteous, and willing to serve. This will make consumers loyal and five respondents said that sufficient and convenient parking spaces for Thai coffee brands are important for their loyalty.

12. THE RESEARCHER HAS SUGGESTIONS FOR THE BENEFIT AS FOLLOWS.

Entrepreneurs should pay attention to having a variety of coffee menus to choose from. Maintain the quality of aromatic Thai brand coffee flavors Concentrated, maintaining uniqueness that is outstanding and novelty to make consumers loyal. Choose a container and packaging. Made from natural raw materials, environmentally friendly, modern, eye-catching, may choose to use packaging that can be reused or used for other purposes to create interest and be different from foreign coffee shops. along with desserts or bakery Various local good products to attract more consumers' attention.

- Entrepreneurs should set product prices that are suitable for quality. There are several prices according to the features and size of the package. There are clearly labeled product prices.
- Entrepreneurs should choose a distribution location with sufficient parking space. And it is convenient to access additional services with delivery services.
- Entrepreneurs should organize promotional activities on the days when there are few users. There are special discounts on festivals or free gifts on special occasions. Advertise through various media appropriately.
- Entrepreneurs should focus on selecting service personnel who have personality, dress appropriate, service-minded, and good-natured. Equally friendly service, quick and accurate delivery of goods Recognize regular customers to impress.
- Entrepreneurs should decorate their stores to be modern, clean, and arrange the atmosphere in the stores to be uniquely Thai. friendly media Sufficient seating inside and outside the store is allocated. Arrange a place to take pictures to be shared on social media as a way of communicating, creating a wide recognition and recognition of the store.

13. RECOMMENDATIONS FOR FURTHER STUDIES

Should study the quality of Thai coffee shop service that affects service use.

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OPTIMIZING WAREHOUSE MANAGEMENT OF ABC COMPANY

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The objective of this study is to increase inventory management efficiency of ABC Company. To study warehouse management of ABC Company to study efficiency ABC company warehouse management to compare performance ABC Company Warehouse Management Classified by personal data To study the relationship between warehouse management and warehouse management efficiency of ABC Company to study warehouse management Influencing the warehouse management efficiency of ABC Company The questionnaire was used for 53 sets. It is a tool for collecting data and using statistics to analyze data, namely percentage, average. hypothesis testing t-test, F-test (One-Way ANOVA) Correlation and Multiple Regression Analysis

The study found that most of the respondents were between 20 and 30 years old with a bachelor's degree. Positions in other positions and have worked for more than 3 years. Data on ABC's inventory management priorities showed that the receiving side product storage Distribution An overview of ABC Company's warehouse management priorities is at the highest level of importance Data on ABC's inventory management efficiency found that Right Product, Right Product, Right Quantity, Right Quantity, Right Condition, Right Condition, Right Place, Right Place, Right Customer, Right Customer, Right Time Right on time. Overall, ABC's inventory management efficiency was in the highest level of agreement. Personal information, age, education and job title The effect on the efficiency of the ABC company's warehouse is not different.

Personal information about working age Different ABC company warehouse optimization effect is different. warehouse management receiving goods product storage and product distribution Overall, there is a correlation with ABC Company's warehouse optimization. same direction high correlation level warehouse management receiving goods And the product storage has an influence on increasing the efficiency of ABC's warehouse and found that warehouse management Distribution There was no influence on the efficiency of ABC Company's warehouse at statistical significance at the .05 level.

Suggestions from the study to be used as a guideline for increasing warehouse efficiency in the future. There should be more studies on how to increase the efficiency of storage space management within the warehouse due to current Increasing the flexibility of storage space to support the purchase demand of customers who are not certain It helps the organization to meet the purchasing needs of its customers. It also takes advantage of the storage space that is limited. for maximum efficiency

Keywords: efficiency improvement, warehouse management

1. INTRODUCTION

Nowadays, warehousing is one of the important activities of logistics. It is an important part of a supply chain management system that helps connect with other activities in the supply chain. Good warehouse management will help the organization to have an infrastructure. Good infrastructure A warehouse generally serves to store goods between different points in the shipping process. Inventory Management Plays an important role in making customers satisfied. especially warehouse management which is a supporting activity that makes receiving goods delivery of goods and efficient delivery because of good warehouse management will save time and operating costs such as inventory control Determining the storage location each type of product so that it can be picked up accurately and quickly In order to manage the inventory system to be effective. in order to be able to respond to customer needs (Li, 2011).

From the foregoing, many activities related to the logistics system will occur in the warehouse system Because warehousing is a place where goods are stored, an essential component in modern supply chains, many activities in warehousing involve multiple steps in production. and distribution starting from Receiving raw materials, storing, unloading raw materials Work in process to inventory storage and finished storage Therefore, warehouse management is very important to every business. If business owners can reduce the cost of warehouse management, it means that Businesses will have more competitive advantages or be able to make more profits. (Jacobs, Chase, & Lummus, 2014)

Since the import and export business has many domestic competitors. And the company's main competitor has the number one market share in the country. Therefore, in order to compete effectively in business. to gain more competitive advantage Therefore, development and optimization within the company must be the first step. Therefore, (Blenkhorn, & Fleisher, 2005) the development of the company's logistics system is extremely important. According to the study of the warehouse management of ABC Company, there are problems that arise. Many things such as unable to find the item, placing the item in the wrong location, picking up or picking up the wrong item, releasing the wrong item. which is part of the activities of bringing products to customers, etc. From the above background, the study has foreseen the importance of studying the warehouse management efficiency of ABC Company in order to find ways to improve warehouse management to be more efficient in order to be ready to support business competition in the future. (Persson, 1991)

2. OBJECTIVES OF THE STUDY

To study the warehouse management of the company ABC To study the warehouse management efficiency of ABC Company to compare the warehouse management efficiency of ABC Company classified by personal data. To study the relationship between warehouse management and warehouse management efficiency of ABC Company.

3. HYPOTHESIS

- Different personal information affects different ABC company warehouse management efficiency.
- Warehouse management is correlated with ABC company warehouse management efficiency.
- Warehouse Management Influences ABC Company Warehouse Management Optimization

4. SCOPE OF STUDY

- Content A study on increasing the efficiency of warehouse management of the company. based on theory Warehouse management (Warehouse Management) consists of receiving goods, storing goods. and product distribution and the concept of 7 R Logistics by studying only Right Product, delivering the right goods, Right Quantity, right quantity, Right Condition, transporting in the right condition, Right Place transporting to the right place, Right Customer transporting for the right customer. Right Time

- Population and sample used in the study He is an operating officer of ABC Company. Select a sample of 53 people.

- The period of study between November 2021 - February 2022

5. WAREHOUSE MANAGEMENT

Definition of warehouse management

Warehouse is a place for placing, storing, resting and distributing inventory. It may be called by other names such as distribution centers. Distribution centers, warehouses, warehouses, storage units, warehouses, liquid storage tanks or bonded treasury no matter what it's called The warehouse also performs the same function, namely Is a place to store products or raw materials or items to support the various activities of the delivery process A warehouse is where goods are received, sorted and then distributed. (Jarke, Lenzerini, Vassiliou, & Vassiliadis, 2002)

defined the meaning of warehouse management as Warehouse management (Warehouse Management) is the management of receiving, storing, means delivering goods to recipients for sales activities. The main goal in business administration In relation to the warehouse, it is to achieve a systematic operation that is worth the investment. quality control of the collection picking, preventing, reducing losses from Operate to keep operating costs as low as possible. and taking full advantage of the area (Richards, 2017)

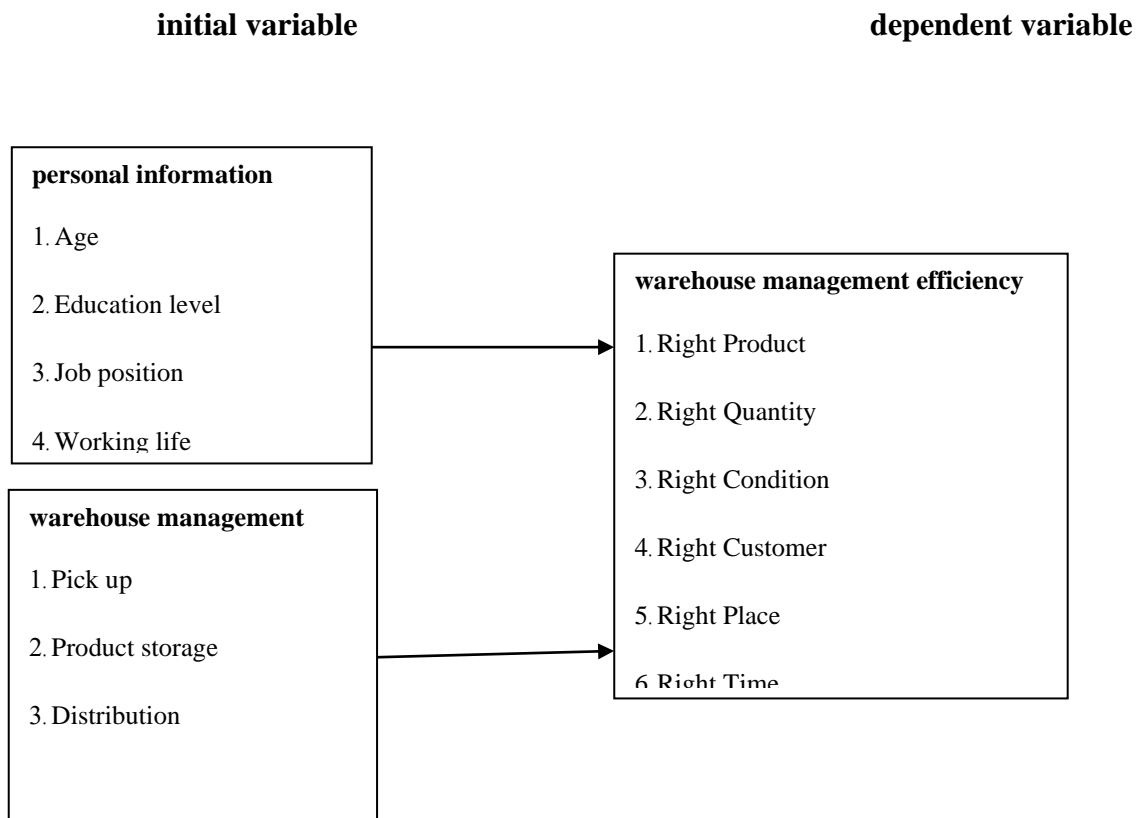
6. THEORETICAL CONCEPTS RELATED TO WAREHOUSE MANAGEMENT.

1. Goods receiving includes activities such as loading and unloading goods from a vehicle that is brought into a warehouse. counting the goods to match the amount ordered Including taking back products from customers, etc. Receiving goods is therefore the basic activity of every warehouse as a place to hold products. If there is a good receiving management The organization ensures that there is sufficient supply to meet the needs of its customers, no matter where they are in the supply chain.
2. Product storage Activities in storing goods such as planning for effective storage of goods The consolidation of goods received from several small shipments together. to combine into a large product Separating the products into smaller numbers (Break Bulk), etc. The management should have a good storage management. In order to reduce storage costs (Storage Cost), which will reduce the cost of the organization. In addition, storing goods creates value added in the product (Value Added) when it reaches its destination.
3. Distribution It is an activity that executives must plan in order to distribute products according to the right quality, the right quantity, the right time, the right place, and the right condition. customer specified This will result in a consistently good level of service. By distributing products, there are important activities such as delivering products to sellers. Transferring goods from one warehouse to

another. Within the same organization, etc. Distribution is also related to other tasks, such as transportation (Transportation), inventory (Inventory Management), etc.

7. CONCEPTUAL FRAMEWORK

From the aforementioned studies, the researchers relied on the concepts of warehouse management theory and 7R Logistics theory to summarize and integrate into a conceptual framework for studying the efficiency of warehouse management of ABC Company as follows:



8. RESEARCH METHODOLOGY

The study of inventory management efficiency of ABC company aims to study ABC company's warehouse management efficiency, ABC company's warehouse management efficiency, compare ABC company's warehouse management efficiency classified by personal data. relationship between Warehouse Management and Warehouse Management Efficiency, ABC Company Warehouse management affecting warehouse management efficiency, ABC Company The data from the study can be used as a guideline to increase warehouse management efficiency so businesses can operate efficiently. has set the method of study as follows

An analysis of the relationship between warehouse management is related to increase efficiency ABC company warehouse

warehouse management	Optimization relationship ABC			
	r	Sig	relationship level	level
receiving goods	.783**	.000	same direction	1
product storage	.730**	.000	same direction	2
Distribution	.697**	.000	same direction	3
ภาพรวมเฉลี่ย	.808		same direction	

** Statistically significant at the .01 level (2-tailed)

Warehouse management is related to an optimization relationship. Company warehouse ABC overall average has a high degree of same direction correlation (r) = .736

CONSIDER THE RELATIONSHIP FROM THE CORRELATION COEFFICIENT R IN DESCENDING ORDER IN THE FOLLOWING ORDER:

- 1 . Warehouse management is related to ABC company warehouse optimization relationship in receiving goods. High correlation level in the same direction (r) = .783
- 2 . Warehouse management is related to ABC Company's warehouse optimization relationship in storage. High degree of homogeneous correlation (r) = .730
- 3 . Warehouse management is related to distribution company ABC's warehouse optimization relationship. High degree of homogeneous correlation (r) = .697

Comparison of Influence Warehouse Management to ABC Company Warehouse Optimization

Warehouse Management	B	Std. Error	Beta	t	Sig.	Test
(Constant)	1.124	.384		2.928	.005	yes
receiving goods	.389	.128	.458	3.029	.004	yes
product storage	.255	.119	.283	2.138	.038	yes
Distribution	.127	.126	.139	1.010	.317	No

** Statistically significant at the .05 level (2-tailed)

Comparison of Influencing Warehouse Management Increasing warehouse efficiency, ABC found that warehouse management had a significant influence on ABC warehouse efficiency, except for the distribution aspect which had no influence on ABC warehouse efficiency at statistical significance at .05 level. It can be seen that the aforementioned warehousing management has a large influence on ABC's warehousing efficiency, but for distribution, it has no influence on ABC's warehousing

efficiency.

9. SUMMARY, DISCUSSION, AND RECOMMENDATIONS CONCLUSION

The objective of this study is to increase inventory management efficiency of ABC Company. To study the warehouse management of ABC Company To study the warehouse management efficiency of ABC Company To compare the warehouse management efficiency of ABC Company classified by personal data To study the relationship between warehouse management and inventory management efficiency of ABC company. To study the influence of warehouse management on ABC company warehouse management efficiency. A questionnaire of 53 sets was used as a tool for data collection and statistical analysis was used for percentage, mean, hypothesis test, t-test, F-test (One-Way ANOVA), Correlation and Multiple Regression Analysis from the results. Data analysis can be summarized as follows.

10. PERSONAL INFORMATION

According to a study on the efficiency of warehouse management of ABC Company, it was found that most of the respondents were between 20 and 30 years old, with a bachelor's degree. Positions in other positions and have worked for more than 3 years.

ABC's warehouse management information

According to the study of information on the importance of warehouse management of ABC Company, it was found that the receiving of goods product storage Distribution Overall, ABC's warehousing management priorities were the highest. The details are as follows.

receiving goods The results of the study were found to be at the highest level of significance. with important details At the most important level, 5 things are recorded in the system. Receiving must be correctly classified by product type or by station. Receiving can accurately monitor the receiving status in the system. There is a barcode scanner to receive and check the condition of the product before receiving every time. and deliver the goods to the next section on time

product storage The results of the study were found to be at the highest level of significance. with important details It is at the most important level of 5 things, consisting of properly storing each type of product. Check for leftovers along the sides of the conveyor belt. Store products that are large lots or heavy items correctly according to their location. How to properly store products according to the shelf. Store small and lightweight products and high-value products correctly.

Distribution The results of the study were found to be at the highest level of significance. with important details At the 5 most important levels, consisting of knowing the product release process, scanning correctly, customers receive the product correctly, completely and quickly, delivering it to the station correctly. Preparing products to be delivered to trucks on time according to the release cycle and knowing the location of the products that will be distributed.

ABC's inventory management performance data

According to the study of data on warehouse management efficiency of ABC company, it was found that Right Product, right product, right quantity, right quantity, right condition, right condition, right place, right place, right customer, right customer, right time, right time. Overall, ABC's warehouse management efficiency was at the highest level of agreement. The details are as follows.

Right Product The results of the study were found to be in the most agreeing level. with detailed comments was at the most agreeing level in 4 aspects, consisting of delivering goods to customers that are correct according to the document page Able to verify the actual product with the program correctly Receiving the product is the correct product according to the document page. and store the product, get the correct product according to the document page

Right Quantity The results of the study were found to be in the most agreeing level. with detailed comments was in the most agreeing level in 4 aspects consisting of being able to verify the actual number of products with the program correctly The product reaches the customer's hand 1 0 0 % complete before receiving the count of the correct number of products as specified in the document and store the correct amount of goods according to the storage base

Right Condition The results of the study were found to be in the most agreeing level. with detailed comments It was at the most agreeing level in 4 aspects, consisting of being able to check the actual product condition and accurately record the defective product information. The product reaches the customer in 100% perfect condition before accepting, inspecting the product condition without dents, rotting, wet or tearing and the delivered products in perfect packaging condition without dents, rotting, wetting or tearing.

Right Place The results of the study were found to be in the most agreeing level. with detailed comments was at the most agreeing level in 4 aspects consisting of being able to verify the actual storage location with the program correctly Store the products correctly according to the shelf or each category properly. deliver the goods to the station or the truck picks up the goods correctly and pick up and place the goods on the correct pallet according to the location

Right Customer Right Customer The results of the study were found to be in the most agreeing level. The details of the opinions were in the highest agreeing level in 4 aspects, consisting of delivery of products with correct delivery documents according to customer details. Delivery of goods and customers who receive the goods correctly according to the details on the box and documents. Products are labeled or identified according to the customer list. And able to verify that the product details are true and the program is correct.

Right Time The results of the study were found to be in the most agreeing level. with detailed comments It is in the most agreeing level of 5 factors, consisting of being able to identify the location of the actual product from checking the status of the product in the program accurately and precisely. Deliver goods around the car The customer receives the product no later than the date stated. Able to check the date that the customer actually received the product with the program correctly Pick up and prepare items according to the scheduled release cycle. and can be stored at the specified time

11. HYPOTHESIS TEST RESULTS

- **Hypothesis 1** : Different personal information affects ABC company warehouse management efficiency differently. Personal information, age, education and job title The effect on the efficiency of the ABC company's warehouse is not different. The study found that Personal information about working age Different ABC company warehouse optimization effect is different. The relationship between warehouse management is related to optimization. ABC company warehouse **hypothesis test results**
- **Hypothesis 2** : Warehouse management is related to ABC's warehouse management efficiency. warehouse management receiving goods product storage and product distribution In general, there was a relationship with ABC Company warehouse optimization at a high level of correlation in the same direction.
- **Hypothesis 3** Warehouse management has an influence on ABC Company's warehouse management efficiency. warehouse management receiving goods And the product storage has an influence on the efficiency of ABC's warehouse and found that warehouse management Distribution There was no influence on the efficiency of ABC Company's warehouse at statistical significance at the .05 level.

12. DISCUSSION OF THE RECOMMENDATIONS RECEIVED FROM THE STUDY.

The researcher has suggestions for the benefit as follows:

In this study, the warehouse management of ABC Company was realized to be used as

Guidelines for increasing the efficiency of inventory management of ABC Company are as follows:

1. Receiving goods In the process of receiving the product Before receiving the product into the system, you must check the correctness of the product (Right Product), count the number (Right Quantity), and check the completeness (Right Condition) first every time. and then receiving the product into the warehouse by recording data by scanning a barcode in the system every time to prevent problems with incorrect products incomplete and imperfect condition Including receiving, must separate the product type or separate according to the station on the pallet correctly It will help to confirm the receiving status in the system precisely. resulting in delivery of goods to the next work segment on time and most efficient

2. Product storage In the process of storing the products before storing the products to the location, you must check the correctness of the product (Right Product), count the number (Right Quantity), check the completeness (Right Condition) first every time, and then store the product to the Location. By the method of saving data by scanning the barcode into the system every time

Each type of product should be stored properly. Check the remaining product. along the side of the belt Store products that are large lots or products that are heavy according to the correct location Store products correctly according to the shelf Store small and lightweight products and high-value products correctly

3. Distribution should learn the process of distributing products to customers to receive products accurately, completely and quickly (Right Customer), prepare products to deliver to trucks on time according to the release cycle (Right Time). Employees Have knowledge and understanding about the destination station of distribution to customers so that the product can be delivered to the customer in the right place (Right Place)

13. RECOMMENDATIONS FOR FURTHER STUDIES

From the results of the study to be used as a guideline to increase warehouse efficiency in the future. There should be more studies on how to increase the efficiency of storage space management within the warehouse. due to current Increasing the flexibility of storage space to support the purchase demand of customers who are not certain It helps the organization to meet the purchasing needs of its customers. It also takes advantage of the storage space that is limited. for maximum efficiency.

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APPLICATION OF DEEP LEARNING AND MACHINE LEARNING ALGORITHMS DIGONISIS OF SICKLE CELL DISEASE

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Sickle Cell Disease (SCD) is a genetic blood disorder that affects millions of people worldwide and early diagnosis is crucial for effective management and treatment. Machine learning (ML) and deep learning (DL) approaches have shown great potential in the field of medical diagnosis, including SCD. This paper presents a comprehensive survey on the current state-of-the-art techniques for predicting SCD using DL and ML algorithms. We review the literature and identify the most effective algorithms for SCD prediction. We provide a critical analysis of the strengths and limitations of various algorithms and highlighted the challenges and opportunities for future research in this area. Our findings suggest that DL and ML algorithms have the potential to significantly improve the accuracy and speed of SCD diagnosis, which can ultimately lead to better management and treatment of the disease. We also discuss the need for the development of standard to facilitate the evaluation and comparison of different DL and ML algorithms for SCD prediction.

Keywords: Sickle Cell Disease, Deep Learning, Machine Learning, Predictive Modeling, Diagnosis, Algorithms, SCD diagnosis.

1. INTRODUCTION

The hemoglobin, a protein present in red blood cells that transports oxygen throughout the body, is affected in sickle cell disease, a hereditary illness. The HBB gene, which gives instructions for producing beta-globin, a component of hemoglobin, is mutated, which results in the condition. People with sickle cell disease produce abnormal hemoglobin molecules, which can cause red blood cells to become misshapen and rigid, taking on a sickle shape. These sickle cells can get stuck in small blood vessels, blocking the flow of blood and oxygen to organs and tissues. This can cause a range of health problems, including pain, anemia, organ damage, and an increased risk of infections. These crises destructed all organs that belong to corporality. So, it caused deadly diseases like Hand-Foot Syndrome (50% of children have faced it from two years of age), Aplastic Crisis (damage to red blood cells in bone marrow), Splenic Sequestration, Priapism, Neurology Complications, Excessive Iron Store, Lung Disease, Leg Ulcer, Deep Jaundice, Vision Loss, Brain Stroke, etc. just because the little stranger who suffered from SCA can't live with damaged inner organs. Often such children died within two years only. Sickle cell disease is a lifelong condition that affects thousands of people in world, particularly those of African descent. It is usually diagnosed through a blood test that measures the amount and type of hemoglobin in the blood. While there is currently no cure for sickle cell disease, treatment options include medications, blood transfusions, and bone marrow transplants. In Chhattisgarh circa 12% total population is injured due to Sickle cell anemia diseases, mostly found in the Semi-Treble area. Early detection and management of sickle cell disease can help to reduce the risk of complications and improve quality of life

for people living with the condition. Advances in genetic testing and machine learning techniques, including deep learning, are providing new opportunities for earlier detection and more personalized treatment of sickle cell disease. The purpose of this survey is to examine the current state of the art in the prediction of sickle cell disease using deep learning techniques. The survey will explore the different approaches and methods used to develop deep learning models for predicting sickle cell disease, including data preprocessing, feature extraction, and model architecture. The survey will also review the performance of different deep learning models for sickle cell disease prediction, including their accuracy, sensitivity, and specificity. Additionally, the survey will discuss the challenges and limitations of using deep learning for sickle cell disease prediction, including data availability, model interpretability, and ethical considerations. Overall, this survey aims to provide a comprehensive overview of the current trends and challenges in using deep learning for sickle cell disease prediction and to identify areas for future research and development.

2. LITERATURE REVIEW

Develop a robust model using intelligent methods such as image processing and classification to accurately diagnose sickle cell disorders.

(Uike & Thorat, 2020) have one or more multiclass algorithms that can identify sickle cell and categorize sickle cell syndrome. These algorithms used automated methods like segmentation, morphological operations to remove extraneous features, and classification techniques like XGBoost, SVM, and others. (Sen et al., 2021) have published a deep-learning CNN model that was created using some modern methods related to pre-trained models like InceptionV3, VGG, ResNet, etc. The model classified the image data into three categories based on the shape of the sickle cell edge: circular, elongated, and others. Results were obtained using the anticipated InceptionV3-trained model with the greatest accuracy of 91%. As seen below, a few authors have discussed:

Kalinovsky & Kovalev, (2016) have worked on lungs related image processing techniques here segmentation approaches are used with respect of deep learning and CNN methods like encoder-decoder convolutional Neural Network, Histogram equalization techniques.

Khalaf et al., (2017) presented classification models from the approaches of Elman Neural Network, Jordan Neural Network, Multilayer Perceptron, Random Forest, Decision Tree, SVM and also approached ensembler-classifier techniques. In such method they are divided 3 types of class for each approach.

Papageorgiou et al., (2017) have summarized the classification techniques for predicting sickle cells from red blood cells using image processing techniques on behalf of deep convolutional neural network approaches.

Yang et al., (2018) have presented the classification techniques during these taking techniques, they have to be worked for images, applying image acquisition, gray scale conversion, Noise filtering, Threshold segmentation, and also feature extraction for getting better accuracy with comparative analysis from previous research.

Aliyu et al., (2018) all are researched as comparative techniques the techniques work on deep learning architecture versus support vector machine, applied classification approaches and divided classes into 5 categorized.

Shinde & Shah, (2018) have introduced review about machine learning and deep learning application. In machine learning basic concepts are discussed like KNN, Naïve bayes, Support vector machine that are deeply analyzed the parameter learning rate. In deep learning, most of the genuine techniques are described as Artificial Neural Network, CNN, RNN, Bidirectional Recurrent Neural Networks, Generative Adversarial Network Its all assist to classification, and segmentation for image processing.

Latif et al., (2019) This paper surveys the use of machine and deep learning algorithms in medical imaging for disease diagnosis and prediction. The authors discuss image classification, object detection, pattern recognition, and reasoning, highlighting the advantages and drawbacks of these techniques and suggesting future directions. The paper provides a useful overview for researchers in the field.

Alzubaidi et al., (2020) awarded by "Classification of Red Blood Cells in Sickle Cell Anemia Using Deep Convolutional Neural Network" This paper, mostly discussion about the classification techniques with approaches of the Deep Convolutional Neural Network, ANN, CNN. The SVM techniques are used for the classification of abnormal and normal images to get the prediction result.

Dheyab et al., (2020) have reviewed the various machine learning ideology, which are highly qualified classifier to explore determine the suitable dose of sickle disorder patients from nine classes that classes are divided through the feature of blood samples (feature extraction methods applied). Mostly two classification models are applied like Naïve Bayes, Levenberg-Marquardt Neural network. But comparing both of that Levenberg-Marquardt Neural Networks have performed with efficient accuracy.

Yeruva et al., (2020) have presented comparisons based on characteristics of sickle cell disorder and for the image processing applied watershed segmentation and few morphological operations for enhancing the images. Some terminology is accessed for getting high accuracy such as SVM, Backpropagation, Self-Organizing Map.

Fadhel et al., (2020) In this paper hardware accelerator are applied as detection of sickle cell, based on cost effective and time consuming. Applying machine learning approach to enhance hardware acceleration.

Mittal et al., (2020) This article discusses the challenges in detecting brain tumors and the use of Magnetic Resonance Imaging (MRI) image segmentation to automate the process. The authors explain the basic concepts of segmentation and image preprocessing. They also explore various deep learning techniques that can be effective for medical image segmentation. This article provides valuable insights for researchers and medical professionals working in the field of brain tumor detection.

Yeruva et al., (2021) This article proposes the use of a multilayer perceptron classifier algorithm for the precise detection of sickle cells, which can cause complications and a shorter life expectancy. The approach distinguishes Sickle Cell Anemia into three classes and presents its precision degree compared to other popular algorithms using a dataset obtained from the Thalassemia and Sickle Cell Society.

Tengshe et al., (2021) Sickle cell anemia is a genetic condition that can cause severe anemia and decrease the life expectancy of patients. Early detection and classification of blood cells is crucial for

proper treatment. Manual classification is time-consuming, while image processing and machine learning approaches have limitations. This research proposes using a deep neural network to detect sickle-shaped cells in blood samples, achieving a testing accuracy of 94.57% with a CNN consisting of only 5 convolution layers. Histogram equalization and data augmentation techniques were used for preprocessing and to tackle the shortage of dataset, respectively.

Vicent et al., (2022) This study recommended an automated approach to detect sickle cells in microscopic images of red blood cells using image processing and machine learning techniques. The manual inspection of these images is time-consuming and challenging. The proposed approach segments the images using Otsu and Watershed segmentation techniques and extracts geometrical, statistical, and textural features from them. Four machine learning classifiers, including random forest, logistic regression, naive bayes, and support vector machine, are used to classify RBC into three shapes: circular, elongated (sickle cell), and other shape. The study compares the performance of these algorithms. The proposed approach can significantly reduce the time and expertise required for manual inspection and increase the accuracy and efficiency of the diagnosis.

Haan et al., (2021) have presented a low-cost and accurate device for the automated screening of sickle cell disease (SCD) using images of blood smears captured by a smartphone-based microscope. The system was validated on 96 blood smears (32 of which were positive for SCD) from unique patients, achieving a 98% accuracy and an area-under-the-curve (AUC) of 0.998. This approach has the potential to improve access to cost-effective screening and monitoring of SCD patients in low-resource settings, especially where traditional diagnostic methods are not feasible. Overall, this framework could be a valuable tool in improving SCD management and patient outcomes

Cai et al., (2021) is reviewed Sickle cell retinopathy can lead to vision loss, but screening for the condition is challenging in some areas. This review discusses the use of artificial intelligence and multimodal retinal imaging to improve access to accurate screening for sickle cell retinopathy. The potential of machine learning models to track disease progression and inform clinical management is also explored. These approaches have promising implications for addressing the challenges of sickle cell retinopathy in medically underserved areas.

Arishi et al., (2021) This review highlights the importance of early detection and management of sickle cell disease (SCD) and provides an overview of the various techniques available for SCD detection, including screening tests, confirmatory tests, and genetic tests. While genetic tests can be expensive and require specialized facilities, recent advances in portable point-of-care techniques such as smartphone microscopic classifications and rapid immunoassays provide a low-cost and user-friendly alternative. This review also discusses emerging techniques and potential methods that could help with early diagnosis of SCD.

Agrawal & Al, (2021) In this article, Authors discussed the importance of designing effective Convolutional Neural Network (CNN) models for accurate feature extraction in various fields, including banking, security, and digital documentation. Specifically, the article presents a custom CNN model that utilizes different optimizers to accurately recognize handwritten digits using the MNIST dataset. The results demonstrate that the presented approach outperforms several state-of-the-art techniques in this field.

Abdulhay et al., (2021) This study proposes a CNN-based method for diagnosing Malaria and different types of Anemia without the need for CBC testing. The model is trained on high-resolution microscopic images and achieves a 93.4% accuracy rate, offering a promising low-cost and fast alternative to traditional analysis methods.

Vicent et al., (2022) have developed an algorithm using canny edge and double threshold machine learning techniques to detect sickle cell anemia in overlapping red blood cell images. The algorithm achieved high accuracy, sensitivity, and specificity of 98.18%, 98.29%, and 97.98%, respectively.

Tiwari et al., (2022) These are reviewed the paper and proposed a deep learning-based approach using CMixNet and UNet for the detection and classification of lung cancer. The system achieved better results in sensitivity and specificity compared to existing techniques, reducing false positives and misdiagnoses. The study highlights the potential of deep learning in clinical image analysis for the early detection of lung cancer.

Dada et al., (2022) This article proposes novel techniques for the early detection and diagnosis of sickle cell disease (SCD) using various convolutional neural networks (PCNN, DAPN-48, VGG19, and RESNET-50) on peripheral blood image samples. Results show high sensitivity and accuracy, with PCNN-15 and DAPN-48 performing the best. The techniques are recommended for SCD diagnosis.

Agrawal et al., (2022) This research proposes a hybrid technique that combines deep learning and machine learning algorithms to classify handwritten digits with high accuracy. The proposed model uses CNN as a feature extractor and SVM, KNN, and RFC algorithms for classification. MNIST and EMNIST datasets were used to evaluate the models, and the proposed CNN-SVM, CNN-RFC, and CNN-KNN models achieved excellent recognition rates, with testing accuracy ranging higher. This study provides a significant contribution to improving the recognition rate of handwritten digit classification using hybrid models.

Karunasena et al., (2023) In this research proposes an Artificial Intelligence solution using a region classification Convolutional Neural Network (R-CNN) algorithm to diagnose sickle cell disease. The proposed method achieved an accuracy of more than 90% in identifying sickle blood cells from a dataset of 150 blood smear sample images.

Darrin et al., (2023) This study presents an innovative solution for monitoring sickle cell disease patients using machine learning. The approach has high accuracy and is publicly available, making it a valuable contribution to the field.

Shibu George et al., (2023) This study presents an innovative solution to the time-consuming and costly detection of COVID-19 using CXRs. The proposed approach uses advanced image processing techniques and a VGG-inspired CNN model to achieve high accuracy in multi-class and binary classification, outperforming existing methods.

Kibriya & Amin, (2023) Researchers proposed a framework for detecting COVID-19 from chest X-rays using Convolutional Neural Network (CNN)-based techniques. They used Residual Network (ResNet) architectures for deep feature extraction and support vector machines for classification. Results show that the proposed framework efficiently detects COVID-19 from CXR images.

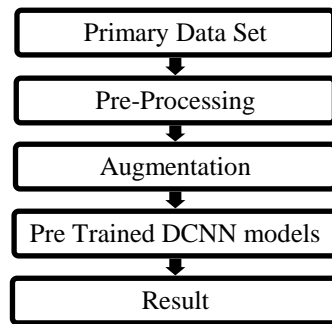


Figure 1: Proposed Architecture of Research Work

3. PROPOSED METHODOLOGY

3.1 Primary Data

In the primary dataset, the Image dataset will be collected from the nearest hospitals like SIMS and Sickel cell institute in Raipur as the reference from (Sen et al., 2021) was also collected from the general hospital (hematology department). After that collecting the dataset of Sickel cell images in the form of microscopy. Mostly the image of microscopy is noisy and not able to have pure visibility. Image dataset shall be divided the respect to training data and testing data. 70% of datasets shall be used for training and 30% of datasets shall be used for testing.

3.2 Pre-processing

Image preprocessing is an essential step in image processing that helps to improve the quality and accuracy of the image analysis results. The following are the typical preprocessing steps that can be applied to an image: -

Image resizing and cropping: Resize/crop images to specific size/ratio to boost processing speed and reduce memory usage.

Image filtering: Filtering involves the use of a filter to remove noise and unwanted features from an image. Common filters include median filters, Gaussian filters, and mean filters.

Image Enhancement: Image enhancement techniques are used to improve the visual quality of an image by increasing contrast, brightness, or sharpness.

Image normalization: Normalization involves rescaling pixel values to improve the contrast of an image or to prepare it for feature extraction.

Image feature extraction: Feature extraction is the process of identifying and extracting specific features or patterns from an image that can be used for further analysis or classification.

3.3 Augmentation:

Augmentation is widely used in image processing and computer vision to enhance dataset size, accuracy, and model robustness by creating new training images through random transformations like rotation, flipping, and color adjustments. Here are some common augmentation steps for image processing: -

Flipping: Flipping is the process of flipping the image horizontally or vertically. This is a simple transformation that can double the size of the training dataset and testing dataset.

Rotation: Rotation is the process of rotating the image by a certain angle. This can help the model learn to recognize objects from different perspectives.

Scaling: Resizing the image is the process of scaling. The model may be able to recognise objects at various scales as a result of this.

Noise addition: Adding random noise to the image can help the model learn to recognize objects in noisy environments.

3.4 Pre-Trained DCNN Model for classification:

Steps for pre-trained image classification: Use an existing pre-trained network, input image, apply pre-processing, predict class probabilities.

Xception: Xception is a deep neural network for image classification, based on Inception architecture using parallel convolutions, proposed by François Chollet in 2016.

InceptionResNetV2: InceptionResNetV2 is a 2016 Google-developed deep CNN architecture, improving image classification and object recognition by combining Inception and ResNet.

4. CONCLUSION

(Sen et al.2021) study shows a deep-learning CNN model that accurately classifies sickle cell images into three categories based on the shape of the sickle cell edge. Using pre-trained models like InceptionV3, VGG, and ResNet, the model achieved 91% accuracy. which are more helpful to learn how to design research papers and comparison of all deep learning methods. it will seem to find a pre-trained model will be able used to get the proper result in my research. the conclusion is clear to the approaches of pre trained model from which can reach proper outcomes (Sen et al., 2021).

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AN IMPROVED MODEL FOR CLASSIFICATION OF SKIN CANCER USING DEEP CONVOLUTIONAL NEURAL NETWORKS AND TRANSFER LEARNING MODELS

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ABSTRACT

In this article, we suggest a strategy for the accurate classification of benign and malignant skin lesions using a deep convolutional neural network (DCNN) model that is based on deep learning. In the first step of preprocessing, we apply a filter or kernel to get rid of noise and artefacts. Then, in the second step, we normalize the input images and extract features that assist with accurate classification. Finally, in the third step, data augmentation is applied where the number of images is increased, which improves the accuracy of the classification rate. To determine how well our suggested DCNN model performs in comparison with other transfer learning models such as ResNet, VGG-16 etc. Using the benign and malignant datasets to assess the model, we eventually achieved the highest 95.65% training accuracy and 93.97% testing accuracy, respectively. When compared to current transfer learning models, the end results of our proposed DCNN model show that it is more trustworthy and durable.

Keywords: Image processing, Machine learning, Classification, Transfer learning, Convolutional neural network.

1. INTRODUCTION

The skin is the body's largest and most visible organ. The skin serves as a barrier between the internal organs and the environment. The skin plays a crucial role in shielding the body from harmful ultraviolet (UV) rays. The sun's ultraviolet (UV) rays are harmful to the skin's cells because they disrupt their DNA. Diseases of the skin and malignancies of the skin may have their origins in these. Melanin is a pigment produced by skin cells that blocks the sun's harmful rays. Because dark skinned people naturally produce more melanin, they are less likely to be adversely damaged by UV rays than people with lighter skin. That is why persons with lighter skin tones tended to be the ones to self-report having melanoma (Thaajwer, M. A., & Ishanka, U. P., 2020). Melanoma cancer is the most lethal kind of skin cancer in humans. Malignant melanoma and benign melanoma are the two main subtypes of this cancer. Although only 4% of the population is diagnosed with malignant melanoma, it accounts for 75% of all deaths from melanoma. If melanoma is diagnosed in its earliest stages, when it is most amenable to curative treatment, the patient's life is likely to be spared; however, if the disease is not detected until its later stages, it is more likely to have already spread deeply into the skin (Thaajwer, & Ishanka, 2020). If it develops too far, it will be harder to treat. Melanocytes, which are found throughout the body, are the primary reason for the development of melanoma. Biopsy is the standard procedure for identifying skin cancer. Using this technique, a sample of human cells will be removed from the patient and submitted to a lab for analysis. This is the worst and most excruciating process imaginable. The time needed for testing will increase significantly. The testing process requires more time and effort from both doctors and patients. Using a biopsy increases the

likelihood that the disease will spread to other organs (Kavitha et al., 2022). This computerized analysis will save the amount of time spent diagnosing and boost accuracy. One of the most difficult difficulties for rapid, easy, and accurate diagnosis, especially in developing and developed nations with inadequate healthcare budgets, is the great complexity of dermatological illnesses. Furthermore, it is self-evident that early diagnosis in situations of many diseases decreases the likelihood of disastrous results. Very few environmental factors have been implicated as initiating factors in the development of malignant melanoma skin disorders. In this study, we took a novel strategy during the feature extraction phase of melanoma diagnosis. Our goal is to use a variety of feature extraction methods in order to obtain relatively high accuracy in melanoma classification. In this study, we examine the efficacy of feature extraction followed by classification using texture-based features, shape-based features, and color-based features. Initially, a CNN classifier is used to create each feature extraction method, and accuracy values are determined. Next, we built a classification model using ResNet VGG and measured how well it performed by combining texture and shape features. Our final step was to combine texture, shape, and color variables into a single classification model so that we could evaluate its efficacy. In addition, we employ a CNN classifier-based study to determine which feature/extraction method is the most effective and efficient for melanoma diagnosis (Thaajwer, & Ishanka, 2020).

2. LITERATURE REVIEW

The classification of skin lesions can be done in two ways. There are two types of these techniques: those that rely only on deep learning, and the ensemble of such techniques. In recent years, deep convolutional neural networks (CNNs) have been utilized to address the issue of picture segmentation, demonstrating the widespread adoption of deep learning techniques in this area of research. There have been several suggested semantic segmentation networks that have shown promise. Esteva et al. (2017) suggested a method for classifying skin lesions using the GoogleNet Inception v3 deep learning model. The approach divides skin types into three categories. To begin, the approach distinguishes between malignant and benign skin lesions. Second, this approach distinguishes between keratinocyte-carcinomas and seborrheic keratoses. Finally, the analysis finds malignant melanomas and nevi. They have outperformed dermatologists. The suggested method starts with three skin lesion datasets and then creates a model with GoogleNet Inception v3 convolutional neural network architecture. The model is then used to detect skin lesions. Han et al. (2018) suggested Resnet-152 for the classification of cutaneous lesions. These lesions include basal cell carcinoma, squamous cell carcinoma, intraepithelial carcinoma, actinic keratosis, seborrheic keratosis, malignant melanoma, melanocytic nevus, lentigo, pyogenic granuloma, hemangioma, dermatofibroma, and warts. This study made use of many datasets from several ethnic groups. This study discovered that ethnicity and picture contrast are factors that reduce the classification accuracy of skin lesions. Menegola et al. (2017) suggested six publicly available datasets to identify skin lesions. Deep ResNet-101 and Google Inception-v4 models were trained for classification of malignant melanoma, seborrheic keratosis, and nevus skin lesions. This study found that boosting training photos by merging databases results in more accurate lesion categorization. Hang et al. (2019) suggested attention-based residual learning for melanoma, seborrheic keratosis, and nevus skin lesion categorization. This approach is based on the ResNet deep learning model. The last levels of this ResNet model are represented by attention-based layers. Fujisawa et al. (2019) suggested a four-level skin tumor detection system. This approach allows for the classification of 21 different forms of skin lesions. Skin lesion photos are modeled using

GoogleLeNet, and subsequently skin images are categorized into four stages. First, malignant and benign varieties are distinguished, followed by epithelial and melanocytic groups. This model also detects actinic keratosis, seborrheic keratosis, basal cell carcinoma, and Bowen disease. (Mane & Shinde, 2018) suggested a system, and the results demonstrate that SVM with linear kernel provides the best accuracy. The Otsu thresholding method is used to achieve segmentation. After completing the Otsu thresholding process, the output image's edges become erratic. This is why the Morphological filter is used to smooth out the edges. This technique will extract the color, perimeter, area, irregularity, and texture features from the given skin image. SVM is also utilized in this case for classification. Asha Gnana Priya et al. (2018) suggested system, there are two approaches for segmenting the lesion portion from the improved image: Otsu thresholding and Morphological operations. The ABCD rule might help you extract the features. The retrieved feature values are used to calculate the TDS value. The estimated TDS value is used to determine if melanoma is present or not in dermoscopy images. The TDS is calculated using the ABCD rule. The TDS value determines melanoma.

3. RESEARCH METHODOLOGY

Convolutional Neural Network (CNN) Design.

The CNN (Lopez & Giro-i-nieto, 2017) is a deep learning method that automatically extracts features from images by building a feature map at each convolutional filter. Pooling, convolutional, and fully connected layers characterize the CNN's feed-forward neural network architecture. That is to say, it is a neural network with no dead ends. Many different CNN algorithms have been used to successfully classify images. A reference point from which to gauge progress Using a learning rate of 0.0001 over the course of 50 epochs, the CNN method was applied to both the benign and cancerous datasets. As a result, we were able to validate with a success rate of 96.07%. The adaptive learning rate technique, or Adam for short, is used to determine unique learning rates for each neuron weight. This method provides a standard against which other proposed CNN designs can be evaluated. The CNN method has been successfully applied to both benign and malignant datasets, with testing accuracy of 86.24% achieved using a learning rate of 0.0001 and 50 epochs, and the adaptive learning rate technique (Adam) has been used to optimize the method. It determines a person's rate of learning based on the mass of their neurons. This method provides a standard by which novel CNN implementations can be judged.

VGG Design.

For the purpose of image classification, CNNs (Simonyan & Zisserman, 2015) frequently use the VGG architecture. A convolutional layer with a size of three by three, a max pooling layer with a size of two by two, and a fully connected layer. To categorize photos for our research, we apply VGG 19 and VGG 16, two different models that differ in filter size and the kinds of blocks used in their development (Jaworek-Korjakowska et al., 2019).

ResNet Design.

Adding more layers to a model in a CNN (Pérez et al., 2021) architecture in order to improve performance when training on a large dataset results in the disappearing or ballooning gradient problem and a low accuracy rate. (Li & Shen, 2018). The ResNet architecture was implemented,

which not only addresses the gradient issue but also provides a high degree of accuracy. This is done by further expanding the network without affecting the model's efficiency. ResNet models were trained to identify melanoma using the new dataset, and their accuracy was determined to be 93.97%.

Proposed Architecture and Result Analysis

We show the outcomes of our experiments and the analysis of our models on the ISIC dataset. On a dataset devoid of visual repetition, the performance of two transfer learning models (VGG16 and Resnet50) was examined. Each model was trained for 50 iterations using a 64-training batch. For each iteration, we determined the training accuracy, training error, and validation accuracy or error. We decided to use an adaptive momentum (Adam) optimizer with a 0.001 LR and a categorical cross-entropy loss function. By combining annealing with an LR, we were able to have the optimizer converge to the global minimum more quickly. When the validation accuracy improved, we lowered the LR dynamically every four epochs, preserving the faster computation time with a high LR. If the validation loss did not decrease after each epoch, we decided to cut the LR in half using the 'ReduceLROnPlateau' method in the 'Keras.callbacks' library. In this study, we extract features from two pre-trained models using the Integrated Feature Extractor. Each method is efficient and helps reduce the overall time needed to build and train a deep convolutional neural network model. In the preceding part, we covered two pre-trained models in great detail, and the layer-wise processing in the model for an input image to produce the output image.

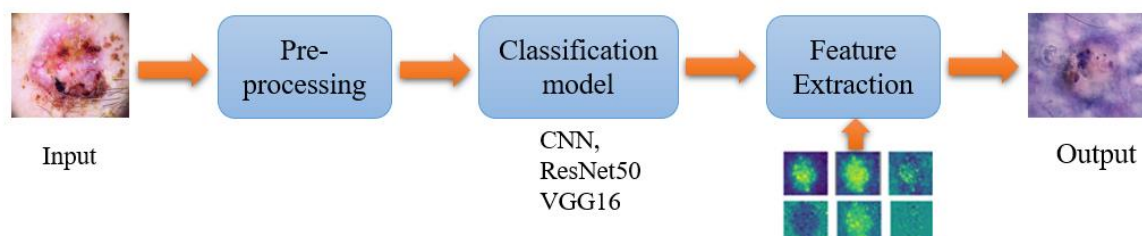


Fig. I: Proposed Architecture for Multi-class Skin Cancer Classification.

Here, features are retrieved successively deeper, layer by layer, to amass a greater number of features for precise prediction. Extraction of characteristics for skin cancer type identification is a task that can be performed by a variety of models. The Integrated Feature Extractor employs the principle of transfer learning, wherein a model learned on one problem is applied on another problem after being fine-tuned, to achieve optimal feature extraction. Because the convolutional layers closest to the input layer learn low-level characteristics like lines, borders, etc., which can be used for efficient training for another problem, we found it safe to employ a pre-trained network for this purpose. We settled on combining the results of the pre-trained model with a few more layers. We customized the weights of the pre-trained models during training to address our specific issue. However, the pre-trained model's weights were frozen before training began, preventing the pre-trained weights from changing when the new model is developed. Here Table II shows that comparative analysis of training and testing accuracy among CNN, ResNet50 and VGG16 models where ResNet5 gives better 95.65% and 93.97% of training and testing accuracy respectively.

Table I : Performance comparison of classifiers with ISIC Dataset using transfer learning.

Models	Training	Testing
CNN	94.25%	86.24%
ResNet 50	95.65%	93.97%
VGG 16	94.24%	92.87%

3.2 Dataset

In this study, we accessed a dataset stored by the International Skin Imaging Collaboration (ISIC). The ISIC is attempting to lower the death rate from melanoma through its Melanoma Project, which incorporates digital skin imaging. With early detection and localization to the skin's surface, the 5-year survival rate for patients with melanoma is estimated to be around 98%. This dataset contains photos of skin lesions that can be used to train classifiers that aid in the detection of melanoma by medical practitioners. The examiner's effectiveness and the technology's capability and applicability are critical factors in obtaining reliable results. The Melanoma Project at ISIC aims to assist lower the mortality rate caused by melanoma by increasing the efficiency and precision of early-stage melanoma detection and decreasing the number of needless biopsies. In this study, we used photos that were retrieved and preprocessed from the extensive ISIC dataset. Table I shows that number of samples in each class of ISIC dataset.

Table II: Skin Lesions Classification dataset description.

	VL	AK	BCC	DF	MEL	NEV	PBK	SK	SCC
ISIC Dataset	285	260	784	222	908	746	956	160	394

This set consists of 2357 images of malignant and benign oncological diseases, which were formed from The International Skin Imaging Collaboration (ISIC). All images were sorted according to the classification taken with ISIC, and all subsets were divided into the same number of images, with the exception of melanomas and moles, whose images are slightly dominant. The data set Contains 9 classes of skin cancer actinic keratosis, basal cell carcinoma, dermatofibroma, melanoma, nevus, pigmented benign keratosis-seborrheic keratosis, squamous cell carcinoma, vascular lesion.

4. CONCLUSIONS

Numerous people die every year from melanoma and other forms of skin cancer. The time, money, and pain associated with conventional treatments (such chemotherapy) can be minimized with an early diagnosis. However, expert understanding of the various malignancies and how they manifest in skin lesions is necessary for accurate screening and diagnosis. Some people may choose to ignore such lesions due to lack of knowledge, apathy, financial concerns, or difficulties in getting an appointment with a doctor. Artificial intelligence and deep learning have recently paved the way for the creation of trustworthy image-based medical screening and diagnostic systems. In In this study, we use deep transfer learning to the problem of screening and diagnosing seven common kinds of skin cancer using a dermoscopy dataset and leveraging recent breakthroughs in the architecture of deep

convolutional neural networks. Pictures of Skin Lesions. This method can achieve great accuracy while reducing the need for specialized labor. Because it doesn't require any explicit feature extraction or human-processed images, it's also simple to construct and put to use in real-world applications. We plan to gather and make publicly available dermoscopy images of underrepresented skin lesion types in order to better balance the dataset in the future.

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REVIEW ON WEBSITE AUTOMATION USING MACHINE LEARNING AND FLASK

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The fashion and entertainment sectors are in high demand in today's society. Users are continually looking for new data and up-to-date trends in these industries. Therefore, it is essential to develop a system that would regularly alert consumers of the same. Today, there are many different recommendation systems that make use of technologies like collaborative filtering, the Bayesian interface, etc. to automatically identify user preferences and create recommendations based on the user's interests. One of the major technologies for delivering personalized services, these recommendation systems should be able to comprehend the context in an environment where IT is omnipresent. In this paper, a machine learning model that combines Random Forest and Gradient Boosting approaches is proposed. A website will be developed that will present the most recent information on the newest trends and upgrades in the fashion and educational sectors, depending on the user's interest.

Keywords: Auto Suggest, Machine Learning, Flask, Front End, Data collection.

1. INTRODUCTION

In today's society, there is a strong demand for the fashion and entertainment industries. Users are constantly looking for new information and the most recent developments in these sectors. Therefore, it is crucial to create a system that would notify customers of the same on a regular basis. There are numerous recommendation systems available today that automatically detect user preferences and generate recommendations based on the user's interests by utilizing technologies like collaborative filtering, the Bayesian interface, etc. These recommendation

systems, one of the key technologies for providing personalized services, ought to be able to understand the context in a setting where IT is pervasive. This is mainly due to the recommendation machine which converts it or the engine's ability to offer consumers specific product suggestions which is based on their browsing habits and previous purchasing history.

Users will be get attracted to return and make additional purchases in our system which is having a dynamic environment because it offers these personalized recommendation. The more frequently a consumer visits our website, the more information we may gather about them and the items, giving us the opportunity to identify areas where the product needs to be improved. The probability of adding more consumers increases with the quality of the product we have. The following image [1] represents this whole continuous cycle process. The suggestion algorithm also aids in boosting sales of goods connected to a specific product. For example, if a customer purchases a CPU from our website, our referral system will make various keyboard ,mouse and monitor suggestions to them. In this sense, it aids in increasing sales of specific item that a user might not otherwise be looking for. Because each user receives a modified recommendation instead of seeing the entire inventory, this recommendation system lessens the strain on the database.

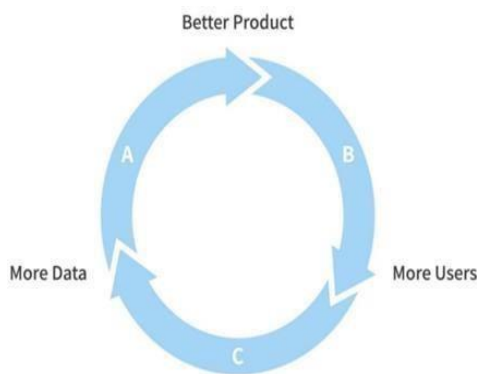


Fig. 1 Illustration of recommendation system

2. LITERATURE REVIEW

L. Haihan et al [1], the system uses neural network methods to extract the characteristics of consumers and goods, then proposes a linked recommendation algorithm known as the U-S recommendation algorithm based on consumer attributes and product similarities. The algorithm determines the user and commodity match rate that is optimal. The findings demonstrate that, when compared to an algorithm based on product similarity, the suggested method can increase the effectiveness of something like the recommendation system.

E. Kantepe et al [2], the MovieLens dataset, and one of the deep learning techniques, autoencoders, were used to create the study's recommendation system. Gradient Descent, Gradient Heritage with Momentum, RmsProp, and Adam (Adaptive Momentum Optimization) were among the best algorithms that were tested during the system design process utilizing TensorFlow in the language of Python programming. Additionally, the impact of increasing the data volume on the optimization technique was examined. The Adaptive Momentum Optimization method, which had a test loss of 1.36, was thus successfully shown to be the most convenient. Additionally, it was discovered that less sparse training data results in lower test error.

M. K. Delimayanti *et al.* [3] used the k-nearest neighbour method and the cosine similarity notion to

increase this system's quality. The quality of the system, which used the Movie Lens dataset, was over 87%. Additionally, using Python data analysis tools and the Django web framework, this research successfully created a client movie recommendation system (RS). Additionally, this technology is accessible through a web page and has an quality rate of over 87% when recommending movies based on some elements of the film.

Jatin Sharma *et al* [4], in essence, is a scanning system that aims to anticipate and display the products that a customer would like to buy. Companies can choose which product to launch in the market to gain more profitable by looking at user preferences. These systems have been shown to be very helpful in a number of fields, including those that involve music, literature, movies, research articles, and items in general. In this work, the authors cover a number of methods and methodologies that are necessary for recommendation engines to recommend goods or services in the fields of books and fashion.

Ketki Kinkar *et al* [5], in this article, a varieties of recommendation techniques are reviewed along with their benefits and drawbacks and several performance metrics. We've looked through a number of articles, assessed their methods and approaches, key aspects of the algorithm they used, and possible areas for development. Cooperative, hybrid, content-based, and recommendation system—are some of the keywords. The most pertinent information is recommended to the user via a recommender system, which is a framework that filters data using various methods. Systems that make a recommendation based on current consumer preferences are effective customization methods that are frequently up to date. These systems have shown to be very beneficial in a variety of fields, including e-commerce, education, media, books, films, music, and diverse products like movies, music, books, and films.

Fátima Rodrigues *et al* [6], customers are now exposed to a larger range of goods and information than ever before. It result, consumer demand becomes more different, making it difficult for a retail establishment to stock the appropriate goods in line with customer preferences. The solution to this problem is to use suggester systems. By recommending products, it is feasible to meet the wants of clients while also luring in new ones. The effectiveness and quality of predictions are nevertheless diminished by the enormous transactional databases that are typical of the retail industry. To overcome these challenges, a joint optimization system that incorporates content-based collaborative filtering, data mining, and other techniques is described in this study. Utilizing customer lifetime value, the recommendation system begins to identify comparable groupings of consumers.

J. Chen *et al* [7], In e-commerce, recommendation systems have evolved into crucial tools for assisting companies in boosting sales. The authors describe in this study how a product recommendation strategy for small internet businesses was designed. Our solution is assessed on its accuracy, productivity, and scalability using actual conducted on a small online marketplace in order to answer the demands of businesses with limited memory pools and low computational resources.

Mayuri G. Dabhade *et al* [8], a novel Domain-sensitive Selection (DsRec) algorithm is proposed in response to the observation in order to do the rating prediction by simultaneously finding the usage subgroup analysis. A user-item subgroup is known as a domain made up of a subset of items with similar character traits and a small minority of users who have interests in these items. CF, or collaborative filtering, is a successful and often-used recommendation approach. CF methods produce predictions by just using the user-item interaction information, such as history of transaction or item satisfaction represented in ratings, in contrast to content-based recommender systems that rely on the profiles of users and products.

Referenc eNo.	Advantage	Disadvantage
[1],[6]	The suggested method can increase the effectiveness of something like the recommendation of the system by using the neural network method.	When compared to an algorithm based on product similarity, The findings demonstrate that the algorithm determines the user and commodity match rate that is optimal.
[2]	So, it was convincingly demonstrated that the Adam technique was the most efficient, with a test loss of 1.365. It was also found that test error decreases with less sparse training data.	The dataset used in this study was unrelated to recommendations, and numerous algorithms were evaluated on various datasets, leading to data loss.
[3], [4]	When proposing movies based on certain aspects or qualities of the film, system, which is available through a web page, and has a prediction performance of over 87%.	No advance or rare algorithm is used here it is just a simple recommendation a system created on the web.
[5],[7]	E-commerce, education, media, books, films, and music are just a few examples of fields where systems that offer recommendations based on current customer preferences are efficient and often updated. These fields also include different products like movies, music, books, and films.	It is not particularly advantageous for small businesses because it demands substantial processing resources and small memory pools.
[8]	In response to the discovery, a prediction system is put out that simultaneously examines the usage subgroup analysis and attempts to anticipate the rating.	Prediction of the rating depends upon the selling of the product among consumers, to predict the reviews and rating one needs to explore the selling of the product first. So to make the system use this system needs to predict the selling of a particular product so that higher revenue can be generated.

3. EXISTING SYSTEM

There are numerous sorts of recommender systems that are useful in a variety of circumstances. In-depth reviews of several of the current recommendation systems are provided in this section. Like, in the system of recommendations on Amazon.com, the product-to-product collaboration technique utilized by the Amazon.com recommendation system can be applied to e-commerce websites like online shopping etc. They customize the online store for each consumer using autosuggestion algorithms. Similarly, in Invocation Agent Systems, the Remembrance Agent are the type of software that improves memory by presenting a list of papers that can be pertinent to the user's current situation. Without user input, it operates. It constantly keeps track of user activity and spots information demands.

4. PROBLEM STATEMENT

In order to improve consumers' experiences with the business, personalized solutions in the online store is based on tailoring the content displayed on the company's website to the customer's requirements and expectations. Never before have personalized recommendations been more crucial for companies trying to draw in and keep clients. Nine out of ten customers, according to research, are more likely to make purchases from companies that offer useful offers and suggestions. Some of the available recommendation systems only work for some selected brands and only tend to show the latest products or do marketing of the products from where they are getting higher revenue. This problem statement is chalked out and no ads system is proposed in our project so that user gets personalized experience according to their field of interest.

5. PROPOSED METHODOLOGY

One of the most effective personalization tools in the modern digital world is a recommendation engine. The product suggestion engine is a straightforward solution, despite appearances. It suggests products that consumers might find interesting, as the name would imply. The recommendation system's utilization of machine learning, artificial intelligence, and other technology is crucial to its effectiveness. Because the approach uses machine learning, the hypotheses will get better as more data is gathered. In other words, the recommendations are more accurate the deeper the engine runs and gathers data.

We propose to develop a recommendation website using the Flask application. The website design will be as follows:

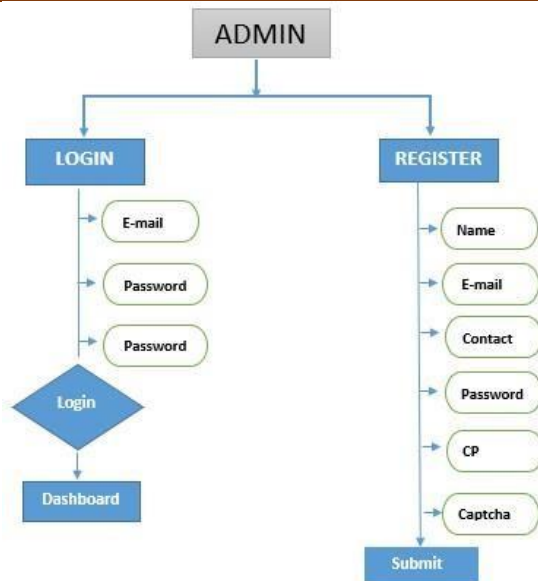


Figure 1: Admin Panel View

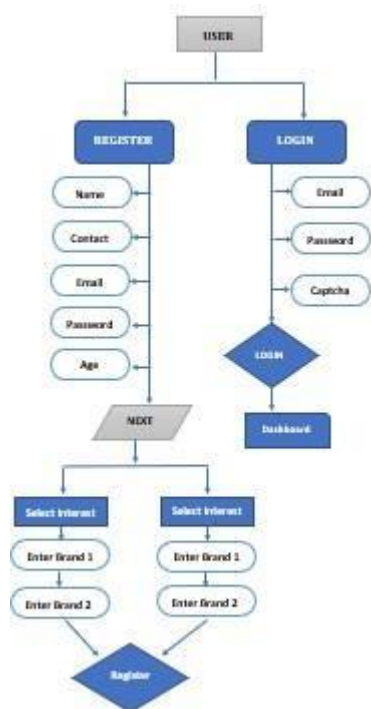


Figure 2: User Panel View

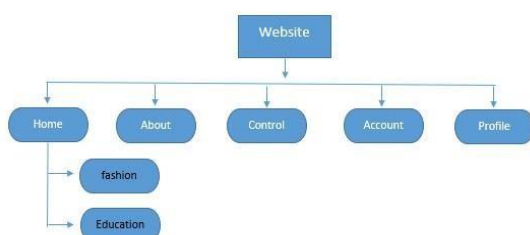


Figure 3: Landing Page View

6. Algorithms:

In this auto recommendation system we are using three algorithms for the accuracy purpose, the short description of the algorithms are given below:

Random Forest (RF): This is a classifier algorithm that works on the basis of decision trees on the given dataset. It is declared that the more the number of trees than more the accuracy is obtained. The RF takes less training time and predicts output with higher accuracy.

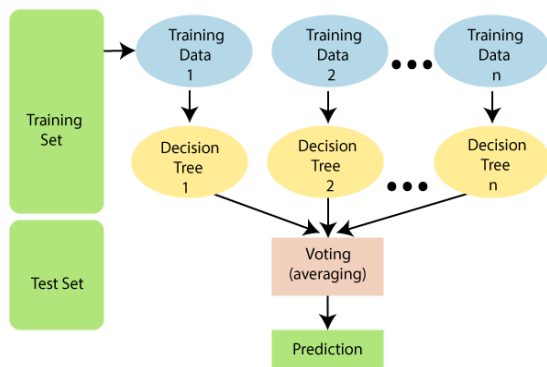


Figure 4: Working Module of RF

Support Vector Machine (SVM): It is a very popular supervised algorithm amongst others. It is highly used for classification and regression-related tasks. Basically, its work is to draw a boundary line between the subsets or datasets passed to categorize them accordingly. And the decision boundary made by SVM is known as hyperplanes.

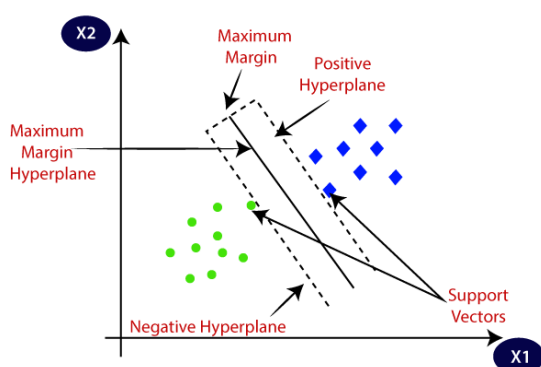


Figure 5: Working Module of SVM

K-Nearest Neighbour (KNN): This is the simplest and easy-to-use algorithm that is again used for classification and regression-related problems. It does not learn at the time of training instead it runs the program and then passes its decision to the subsets. This can be used when we have two similar-looking categories and are confused about which to switch then KNN can make a new x point or category to make a decision and predict the original category.

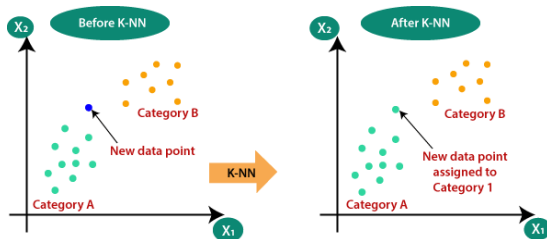


Figure 6: Working Model of KNN

7. CONCLUSION

An algorithm with the best results on the accuracy, and Precision will be considered the final model for the website. Depending on the user's interest, the website will give the most updated information on the newest trends and advancements in the fashion and educational sectors. The user will also be editing his/her interest timely and will get notifications and updates accordingly.

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OPTIMIZING LEARNING OUTCOMES: A MACHINE LEARNING-BASED FRAMEWORK FOR ASSESSING STUDENT AND TEACHER PERFORMANCE

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This paper proposes a novel framework for assessing student and teacher performance using machine learning techniques. The goal of this framework is to optimize learning outcomes by providing an accurate and objective assessment of student and teacher performance. The proposed framework utilizes various data sources, including student grades, attendance records, and teacher evaluations, to train machine learning models that can predict student performance and teacher effectiveness. The models are trained on historical data to identify patterns and relationships between different variables, which can then be used to make predictions about future performance. The framework is designed to be flexible and adaptable to different educational contexts and can be used to evaluate performance at various levels, including individual student and teacher levels, as well as at the level of classrooms, schools, and districts. The results of the framework can be used to identify areas for improvement and to develop targeted interventions that can help students and teachers achieve better outcomes. The proposed framework represents a significant advance in the field of educational assessment and has the potential to revolutionize the way that student and teacher performance is evaluated. By leveraging the power of machine learning, this framework can provide insights and recommendations that can help educators optimize learning outcomes and improve educational outcomes for all students.

KEYWORD: Classification Techniques, Machine Learning, Education System

1. INTRODUCTION

Education is a fundamental aspect of human development, and the quality of education plays a crucial role in shaping the future of individuals and society as a whole. In recent years, there has been a growing interest in using machine learning techniques to optimize the learning outcomes of students and improve the performance of teachers. The use of machine learning algorithms in education can provide valuable insights into the learning process, help identify areas of weakness, and suggest personalized learning strategies for individual students. Additionally, machine learning can assist in assessing the performance of teachers and provide valuable feedback for improvement. In this paper, we propose a machine learning-based framework for assessing student and teacher performance to optimize learning outcomes. We discuss the key components of the framework and how it can be used to improve the quality of education. The proposed framework has the potential to revolutionize the way education is delivered and contribute significantly to the achievement of better learning outcomes for students. The proposed framework involves the use of machine learning algorithms to analyze student data and identify patterns and trends in their performance. The framework also includes the use of data analytics to evaluate teacher performance and provide targeted feedback for improvement. By leveraging the power of machine learning, this framework can help teachers identify students who are struggling and provide them with personalized support and resources. It can also provide teachers with valuable insights into their own teaching practices

and suggest strategies for improvement. Overall, the use of machine learning algorithms in education has the potential to transform the way we approach teaching and learning. By providing personalized support and feedback, we can improve learning outcomes for all students and ensure that every student has the opportunity to reach their full potential. The proposed framework represents a significant step forward in this direction and has the potential to revolutionize the field of education.

2. LITERATURE REVIEW

(Sekeroglu et al., 2019) Education is vital for a productive life. Technology, including AI, has evolved and is being used in teaching and learning. Two datasets were used to predict and classify student performance using machine learning algorithms. Pre-processing the raw data before implementing these algorithms may increase classification accuracy.

(Alam et al., 2021) The study's results showed that artificial neural networks outperformed other models and achieved an accuracy of 82.9% when the relief-F based feature selection method was used. This finding has significant implications for policy formulation, target-setting, evaluation, and reform efforts aimed at improving educational outcomes worldwide.

B. et al., (2021) this paper discusses the potential benefits of utilizing Block chain technology in the context of machine learning. The decentralized nature of Block chain and its ability to handle large amounts of data make it an attractive framework for various machine learning applications. The paper identifies several areas where the integration of Block chain and machine learning could be particularly beneficial, such as data management; secure sharing of data, and fraud detection.

Kucak et al., (2018) The paper provides a detailed analysis of the current and future applications of machine learning in education. It highlights the potential of machine learning in areas such as personalized learning, student assessment, and educational research. The authors also discuss the challenges associated with the adoption of machine learning in education and provide recommendations for future research.

Kasinathan, (2020) This article explores the impact of technological advancement on the Future of Work. The author highlights the significant role of technology in driving progress and innovation, with examples ranging from Industry 4.0 to Artificial Intelligence for All strategy. However, the article also notes the social dimension of technology and its effects on the bargaining power of suppliers and workers. The platform economy is cited as an example of a disruptive force that has impacted the labor market.

Jaiswal & Arun, (2021) This article explores how Artificial Intelligence (AI) is being utilized in the education system in India. The focus of the study is on how educational technology firms are leveraging AI to enhance teaching and learning experiences for students. The authors conducted in-depth interviews with subject matter experts and senior managers from leading educational technology firms to identify the potential of personalized learning, recommendation systems, and adaptive assessments. By applying grounded theory, the authors provide insights into the views of the educational technology firms and experts on the use of AI in the education system, highlighting gaps that exist and potential for future applications. The study has practical implications for transforming the education system in emerging countries.

Alam, Selangor Darul Ehsan, Malaysia et al., (2020) This paper discusses the prevalence and contributing factors of mental health problems among higher education students in Malaysia. The author compares different research papers and identifies gaps in the research. The paper also reviews existing machine learning techniques to analyze and predict mental health problems, with Support Vector Machine being the most commonly used algorithm with high accuracy.

Hidalgo et al., (2020) This study explores the impact of ICT on the labor market and the digital divide in Spain, using advanced data analysis techniques to identify the main socioeconomic drivers of digital skills. The goal is to assess the population's training needs and improve the level of sustainable development in the country. Previous research has focused on inequalities arising from the emergence of digital technologies, particularly socioeconomic variables such as gender, age, educational level, income, and habitat. This paper contributes to the field by analyzing the digital skills drivers of the Spanish population and identifying potential training needs.

Santos-García et al., (2021) The study identified the best predictors of high AP using the Boruta algorithm and backward elimination and mapped the AP classification probabilities. Results showed that high AP was primarily related to answers regarding the academic environment and cognitive skills, and the identified answers varied depending on the region. The study also found that a rural-to-urban transition of 8-17 years was correlated with achievement of high AP. Overall accuracies of around 0.83-0.84% and Kappa values of 0.65-0.67% were achieved.

Gupta Anuj, (2015), this paper compares various classification techniques in Data Mining using datasets from the UCI Machine Learning Repository. Classification is the process of assigning an input to a specific category, and Data Mining involves extracting knowledge from large amounts of data. The study evaluates the accuracy and time complexity of each classifier, and uses the Confusion Matrix to compare the different classifiers. The goal is to classify items in a dataset into predefined classes or groups.

Jagadhesan et al., (2021) This paper presents a comparison of different classification techniques in Data Mining by using datasets from the UCI Machine Learning Repository. The study evaluates the accuracy and time complexity of each classifier and uses the Confusion Matrix to compare them. The main objective of the paper is to classify items in a dataset into predefined classes or groups.

Mduma et al., (2019) this paper presents a survey of machine learning techniques for addressing student dropout, highlighting several conclusions. There is a lack of research on using machine learning to address this problem in developing countries, and data imbalance is often ignored by researchers, leading to improper evaluation metrics. Many studies focus on early prediction rather than including ranking and forecasting mechanisms, and school-level datasets must be considered to identify at-risk schools for early intervention.

Padmapriya S. et al., (2015) This research paper explores the use of data mining algorithms in educational data mining to improve students' academic performance and experience. The paper highlights the importance of students' satisfaction and academic performance in educational institutions, and discusses the complex factors that contribute to accurate evaluation and prediction of exam performance. The development of an accurate performance monitoring and evaluation system is identified as a crucial need, and data mining is recognized as a valuable tool to mine raw educational data and support this process. The paper further discusses various data types that can be applied in educational institutions. Overall, this paper provides valuable insights into the potential of data mining in the field of education.

Sean et al., (2012) in this essay, we assess how Teaching Assistants (TAs) affect students' grades. We examine the performance of students in six different basic computer engineering courses with a total of 12 different teaching assistants (TAs) and about 800 students.

Harvey & Kumar, (2019) This review examines the use of predictive classifiers in analyzing K-12 education data. Three classifiers, including linear regression, decision tree, and Naive Bayes techniques, are evaluated and compared in terms of their accuracy in predicting student performance.

The Naive Bayes technique is found to be the most accurate for predicting SAT Math scores for high school students. The results of this review can be used by educators and stakeholders to implement timely intervention strategies for at-risk students.

Bhutto et al., (2020) This paper explores the use of machine learning algorithms, specifically support vector machine and logistic regression, to predict students' academic performance. The results indicate that sequential minimal optimization algorithm outperforms logistic regression in terms of accuracy. The study highlights the importance of identifying impactful features such as teacher's performance and student motivation to reduce dropout rates and improve academic outcomes. The findings can be useful for educational institutions to predict student behavior and intervene in a timely manner.

3. METHOD OF STUDY

This essay covers relevant case studies, scholarly articles, and books. The objective is to gather, organise, and synthesize the most recent information on machine learning techniques for forecasting student and instructor performance. The publications that were surveyed focused on a range of research on machine learning in education, including the predicting of final outcomes, academic accomplishment, and student and teacher performance. The findings of this research are highly beneficial for comprehending the problem and improving solutions. Numerous databases, such as Research Gate, Elsevier, and the Association for Computing Machinery (ACM), as well as Science Direct, Springer Link, IEEE Explore, and others are available. With the use of machine learning techniques and prediction algorithms, we used the words "teacher and student performance" and "teacher and student performance" in our keyword and phrase searches. We searched each article's reference list for any titles of potentially relevant studies or journals. The publication periods taken into account range from 2011 to 2021. We use an abstract and keywords to search PDF files, documents, and full-length publications. In addition, when looking for information, we looked for blog posts, expert seminars, conference papers, workshop papers, and other topic-related communities, for instance, the community for instructional machine learning. The inclusion of the papers in this analysis was supported by a substantial portion of those publications.

4. CONCLUSION

In conclusion, this paper highlights the potential of machine learning algorithms in predicting students' academic performance in educational institutions. The study focused on supervised learning algorithms such as support vector machine and logistic regression, and found that sequential minimal optimization algorithm outperforms these algorithms in terms of accuracy. The results of this research can be used by educational institutions to identify students who are at risk of poor performance and to provide timely interventions to improve their academic outcomes. The study also emphasizes the importance of identifying the most impactful features such as teacher's performance and student's motivation, which can be targeted to decrease the student's dropout ratio. Overall, this research provides valuable insights into the use of machine learning techniques in educational institutions, which can help in improving the quality of education and student outcomes. The goal of this study was to evaluate the current state of machine learning in the context of educational systems. Due to the overwhelming amount of studies (papers and articles) that were accessible, only a small number of them—which we thought were excellent representations—were highlighted in the study's findings. This study indicates that machine learning applications in the realm of educational systems

may be useful in a number of different, interesting ways. For the purpose of addressing the problem of teaching performance, a review of machine learning approaches and classification methods is offered. The first of the report's many conclusions is that while machine learning has been effectively employed in wealthy countries to solve the problem of teaching performance, less study has been conducted in undeveloped countries. Second, despite serious attempts to employ machine learning in education, many academics have decided to ignore the issue of data imbalance. This makes it simpler to assess algorithm performance with erroneous data. Third, many research focus on early prediction rather than ranking and forecasting systems to solve the issue of teaching performance.

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NAPHTHALDEHYDE-BASED SCHIFF BASE LIGAND AS AN EFFECTUAL PROBE TO DETECT CUPRIC IONS

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A novel Schiff base colorimetric sensor 1-[(Pyridin-4-ylmethanimino)methyl]naphthalene-2-ol (**NP**) has been synthesized from 2-hydroxynaphthaldehyde and 4-picolyamine, and characterized with various spectroscopic techniques (NMR, FTIR, and HRMS). Probe **NP** detects Cu^{2+} ions exclusively when treated with different metal ions with a colorimetric response i.e. from yellow to colorless. Absorption studies were performed to test the sensing ability of probe **NP** towards cupric ions. Interference studies also supported the exclusive detection of Cu^{2+} ions, where the presence of different interfering ions negligibly affects the results. Binding ratio among the sensor **NP** and Cu^{2+} ions was obtained as 2:1 which was further verified by HRMS titrations. DFT theoretical computational studies also successfully supported the experimental results. The detection limit calculated for Cu^{2+} ions was 10.4×10^{-8} M.

Keywords: Schiff base **NP**; Cu^{2+} ; Probe, Binding constant (K_a); LOD

1. INTRODUCTION

In recent years, more emphasis is given to studies related to detection of different species including metal ions, anions, nitroaromatics, proteins, *etc.* in environmental samples [Stryer et al. (1967), & Kim et al. (2008)]. Extensive growth in the industrial field produces by-products that are harmful to the ecosystem. Hence, attract researcher's attention to investigate these chemical compounds. For this purpose, sensors are designed based on different frameworks. Molecular probes or chemosensors are those molecules that interact with an analyte to produce a photophysical change which enables to the detection of that particular analyte in a solid, liquid, or gaseous state (Janata, 2001). Commonly, chemical sensors include two major functional units: one receptor and the other transducer part. These units play an important role in the transformation of chemical information into analytically assessable signals [Cattrall (1997), & Demchenko (2009)]. Chemosensors may be classified as (1) optical devices, (2) electrochemical devices, (3) mass-sensitive devices, (4) electrical devices, (5) thermometric devices, and (6) magnetic devices. In addition, Optical devices can be further divided based on optical properties likewise fluorescence, absorbance, luminescence, refractive index, light scattering, and reflectance. Among them, chemosensors based on absorbance (UV-Visible absorption studies) are cost-effective, fast responsive, and require easy sample preparation, and equipment handling. Additionally, colorimetric sensing is also simple and quick method for detection of chemical species in a solvent system.

Molecular probes or chemosensors can be designed using different organic fragments but Schiff bases as molecular probes have caught more attention towards itself [Shaji et al. (2021), Poongadi et al.(2021), Shanmugapriya et al.(2021), & Liu et al.(2022)]. This is because of their electron-rich nature which makes them more active toward several chemical species. Also, their easy synthesis and structural flexibility provide a better tool for sensing purposes [Ashoor et al. (2020)]. For example, Sidana et al.(2022) reported a thiophenol amine-based sensor for dual detection of Cu^{2+} and Hg^{2+} ions with very low LOD values of 5×10^{-8} M and 18×10^{-8} M respectively. Tamizhselvi et al.(2022) synthesized a Schiff base derived from sulfonohydrazide moiety for the colorimetric detection of Cu^{2+} ions with a visible change from colorless to yellow with a low limit of detection 2.74×10^{-7} M. So many chemosensors were already reported for the sole detection of copper metal ions but a very few probes with high sensitivity, selectivity and cost friendly were reported for the sensing.

Copper is an important metal ion in biological processes of almost all organisms from bacteria to mammals. Cu is highly required element in innumerable courses of actions such as in metabolism regulation, healing process for impaired bones, repairment of human impaired tissues, an initiator in hemoglobin formation, cofactor in enzymes, protein structural enhancement, and many others [Yang et al. (2016), Anastassopoulou et al. (2013), & Udhayankumari et al. (2014)]. According US-EPA report, the acceptable limit for cupric ions in drinking water should not surpass 1.3 mg/litre [Zhu et al. (2017)]. Inadequacy of Cupric ions may leads to several neurodegenerative and gastrointestinal disorders, dyslexia, Menkes syndrome, Parkinson's diseases, Alzheimer's disease, and prion diseases whereas its surplus consumption is a source of hazardous diseases that includes Wilson's disease, infant liver impairment, anemia, hepatitis, kidney and bone disorders, and several others [Que et al. (2008), Yao et al. (2013), Hung et al. (2010), & Sarkar (1999)]. To prevent irreparable environmental harm, existence of Cu^{2+} in the effluents must be investigated. We have already reported some pyranone and chromone based Schiff base probes for cupric ions detection [Tomer et al. (2021), Tomer et al. (2022), Bhalla et al. (2022), & Goel et al. (2021)]. Here, we prepared a Schiff base (**NP**) using 2-hydroxynaphthaldehyde and 4-picolylamine compounds by a single-step reaction. **NP** detects successfully Cu^{2+} ions in methanol solvent with negligible interference from the cations taken under consideration. The yellow color of the methanolic solution of **NP** turned colorless on addition of Cu^{2+} ions. Hence, **NP** can be useful efficaciously as a molecular probe for Cu^{2+} ions detection of in real samples.

2. EXPERIMENTAL

2.1. Materials

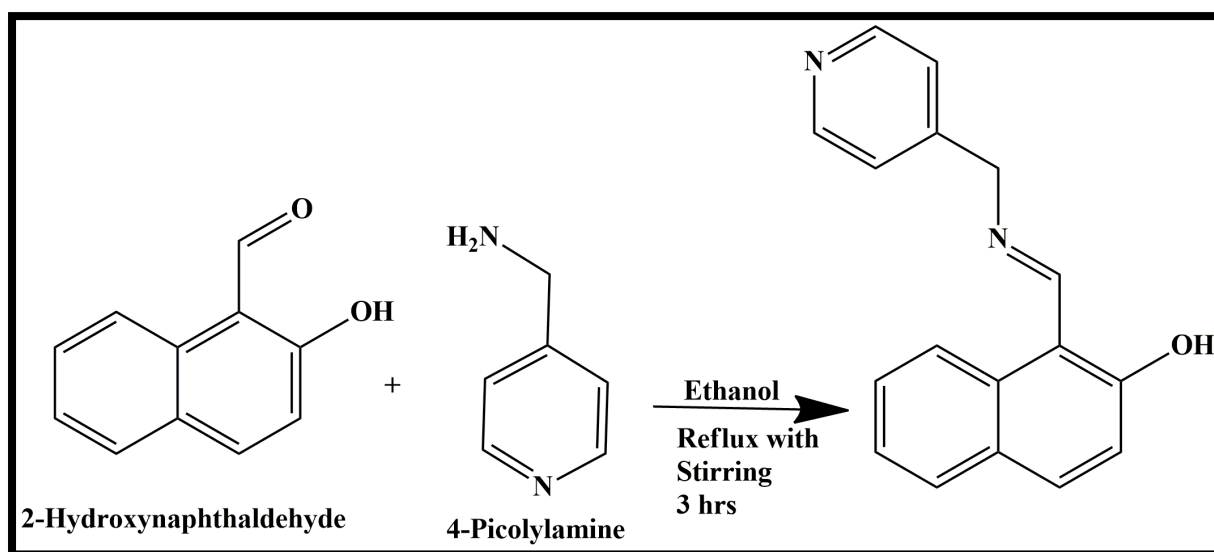
2-Hydroxynaphthaldehyde and 4-picolylamine were bought from Sigma-Aldrich and utilized deprived of further purification. Salts of metal ions (Zr^{2+} , Cr^{3+} , Co^{2+} , Hg^{2+} , Mn^{2+} , Ni^{2+} , Cu^{2+} , Zn^{2+} , Cd^{2+} , Fe^{3+} , Ag^{+}), and solvents of analytical grade (acetonitrile, chloroform, DMSO, ethanol, methanol, THF,) were obtained from CDH. Distilled water has been used throughout the studies wherever required.

2.2. Instruments used

Highly resolute ^1H -NMR and ^{13}C -NMR spectra were obtained by using Avance III, Bruker spectrophotometer with CDCl_3 solvent. The chemical shifts were obtained in ppm units using TMS as internal standard. FTIR spectral studies were done using KBr pellets with a range of $400\text{--}4000\text{ cm}^{-1}$ by Perkin Elmer Spectrum, BX II FT-IR spectrophotometer. A Varian Cary-5000 UV-Vis-NIR spectrophotometer was used to carry out UV-Vis absorption studies with quartz cells of 1.0 nm slit width. The SCIX-QTOF Mass Spectrometer was to record HRMS data. SEM images of compounds were obtained from Field Emission Scanning Electron Microscope (FE-SEM) model no. 7610F Plus/JEOL. Melting point of synthesized compound was determined with open capillary method with the help of Impact Icon melting point apparatus [Model No. 11C 139].

2.3. Synthetic route for preparation of Schiff base NP

In a round bottom flask, 1.0 g of 2-hydroxynaphthaldehyde was dissolved in 30 ml ethanol followed by addition of 20 ml ethanolic solution of 4-picolylamine (0.63 g) with continued stirring. Afterward, mixture was refluxed with continuous stirring and progress was monitored via TLC plates. The yellow-coloured product was obtained by standing the reaction mixture at room temperature for 24 hrs . Yield: 83.5% , M.pt: 195°C . FT-IR (KBr pellet, cm^{-1}): $\nu_{\text{O-H}} = 3422\text{ cm}^{-1}$, $\nu_{\text{C=N}} = 1637\text{ cm}^{-1}$. ^1H -NMR (400 MHz , CDCl_3): $\delta = 9.13\text{ ppm}$ (s, 1H), $\delta = 7\text{--}8\text{ ppm}$ (due to aromatic protons), $\delta = 4.91\text{ ppm}$ (s, 2H). ^{13}C -NMR (100 MHz , CDCl_3): δ (ppm) = 161.03 (C=N), 58.82 (CH_2). The HRMS data, $m/z = 263.1181$ due to $[\text{NP}+\text{H}^+]^+$ [where calculated mass of **NP** = 262.32].



Scheme 1- Synthesis of Schiff base **NP**.

2.4. Solubility of Schiff base NP

The solubility of prepared compound (**NP**) was tested in different solvents. The solvents used for this purpose were acetonitrile (CH_3CN), benzene (C_6H_6), chloroform (CHCl_3), dimethyl formamide (DMF), dimethyl sulphoxide (DMSO), ethanol (EtOH), methanol (MeOH), and tetrahydrofuran (THF). It was observed that **NP** is solubilize completely in all the solvents take under consideration which suggested that no problem will be faced during studies due to solubility factor

however methanol was chosen as solvent for colorimetric and UV-Visible studies for the reason that it is cost-effective, less harmful and can be easily accessible in comparison to other mentioned solvents.

2.5. Sample preparations

Initially, stock solutions of Schiff base **NP** and metal ions of 1 mM conc. were prepared taking methanol solvent. To capture the ability of Schiff base **NP** towards Cu^{2+} through colorimetric detection, a hand-held camera was used. For absorption studies, **NP** of concentration 20 ppm was used for metal ions sensing. In the same way, metal ions solutions of 10^{-5} M concentration were prepared for further experiments.

3. RESULTS AND DISCUSSIONS

3.1. Structural analysis of NP

The ligand **NP** was obtained by condensation of 2-hydroxynaphthaldehyde and 4-picolyamine in 1:1 molar ratio. Structural analysis of **NP** was done by various analytical techniques including, FTIR, NMR, and Mass. FTIR spectrum of **NP** represented characteristic bands corresponding to C=N and O-H stretching at 1637 cm^{-1} and 3422 cm^{-1} respectively which confirmed the formation of Schiff base **NP** as presented in Fig.1.

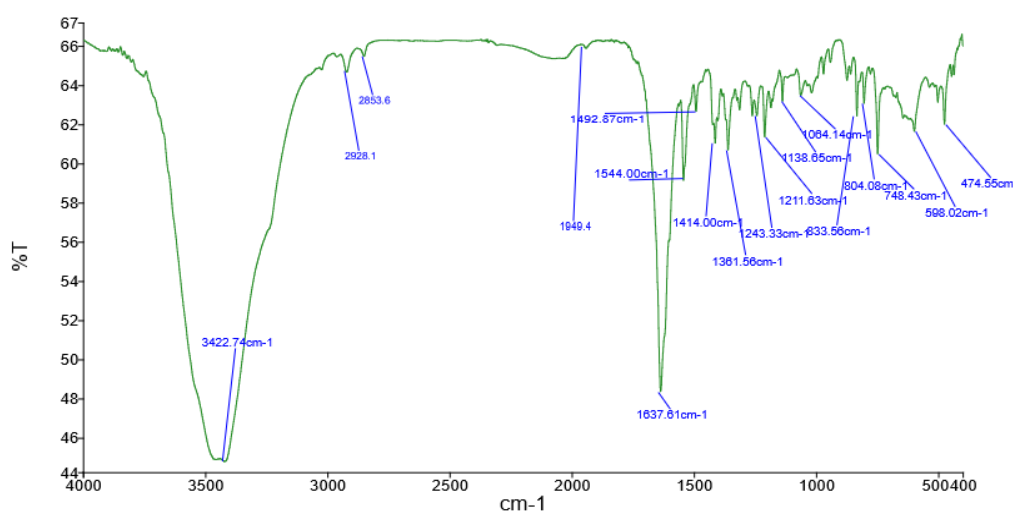


Fig. 1: FTIR spectrum of Schiff base **NP**.

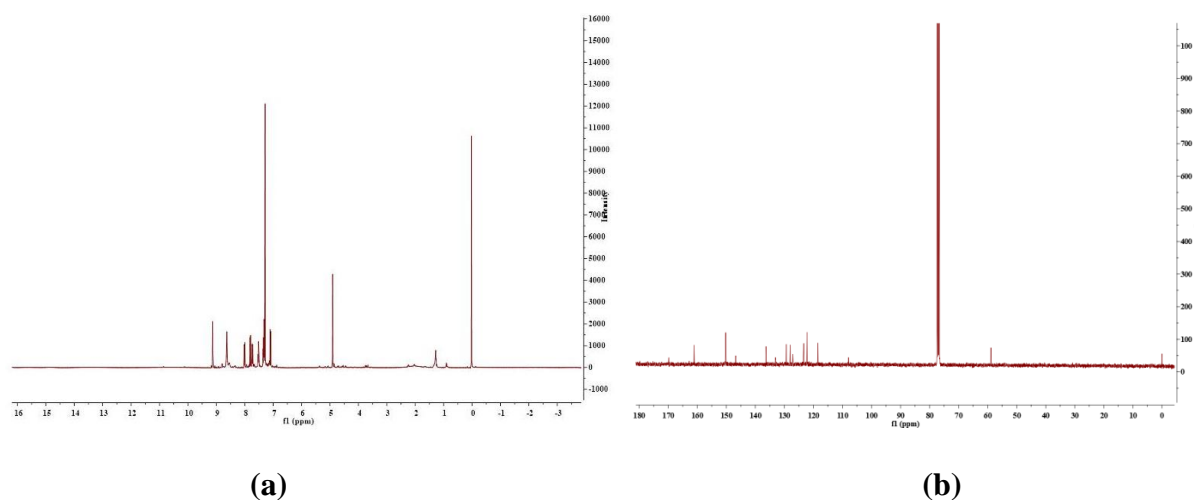


Fig. 2: (a) ^1H -NMR and (b) ^{13}C -NMR of Schiff base **NP**.

^1H -NMR spectrum exhibited peak at 9.13 ppm corresponding to imine proton and in ^{13}C -NMR spectrum the peak at 161.03 ppm corresponding to imine carbon confirmed formation of Schiff base **NP** as given in **Fig. 2(a)** and **(b)**, respectively. The Mass spectrum of **NP** displayed a molecular ion peak at 263.1181 equivalent to $[\text{NP}+\text{H}^+]^+$ which also confirms formation of probe **NP** as shown in **Fig.3**.

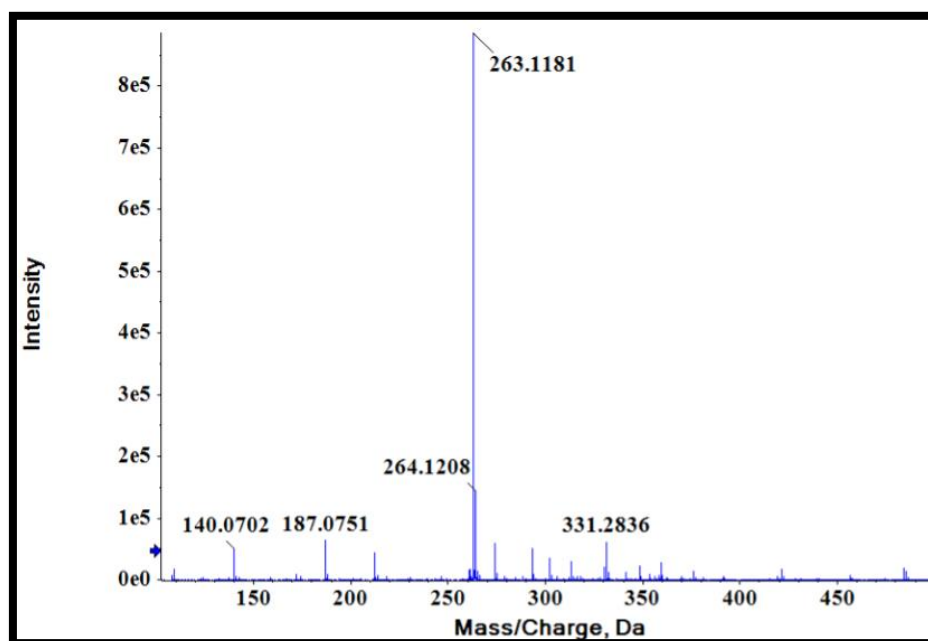


Fig. 3: HRMS spectrum of Schiff base **NP**.

For absorption studies, when UV-Visible absorption spectra of **NP** was taken, it displayed three absorption bands centered at 298 nm, 392 nm, and 410 nm for Schiff base **NP** as depicts in **Fig. 4**.

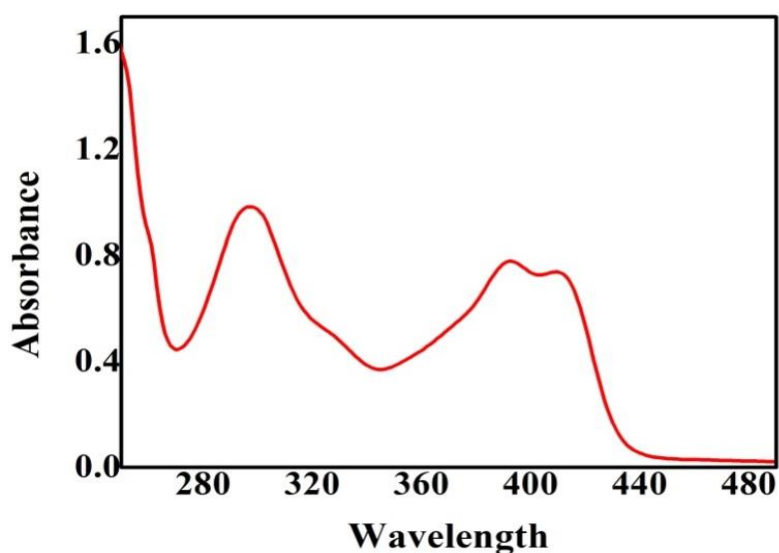


Fig. 4: UV-Vis spectra of ligand NP.

3.2. Studies with metal ions

3.2.1. Colorimetric and absorbance studies

Primarily, solution of **NP** (76 μ M) was treated with (10^{-5} M) solution of different metal ions (Cr^{3+} , Cu^{2+} , Mn^{2+} , Ag^{+} , Fe^{3+} , Hg^{2+} , Co^{2+} , Ni^{2+} , Zn^{2+} , Cd^{2+} , and Zr^{2+}) discretely, solution of **NP** changed yellow to colorless instantly with Cu^{2+} ions solution (**Fig. 5**) whereas no noticeable changes were recorded for other metal ions used for studies. Colorimetric analysis showed that **NP** can be employed for detection of cupric ions.

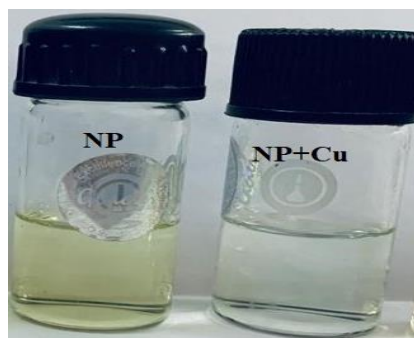


Fig. 5: Color variations in **NP** with Cu^{2+} ions.

Considering the colorimetric results, spectrophotometric studies of **NP** with metal ions were also headed. UV-Vis spectra of **NP** unveiled three absorption bands at 298 nm, 392 nm, and 410 nm. The addition of various metal ions solution did not show any deviations in absorption bands of **NP** other than for Cu^{2+} ions as presented in **Fig. 6 (a)** and **(b)**.

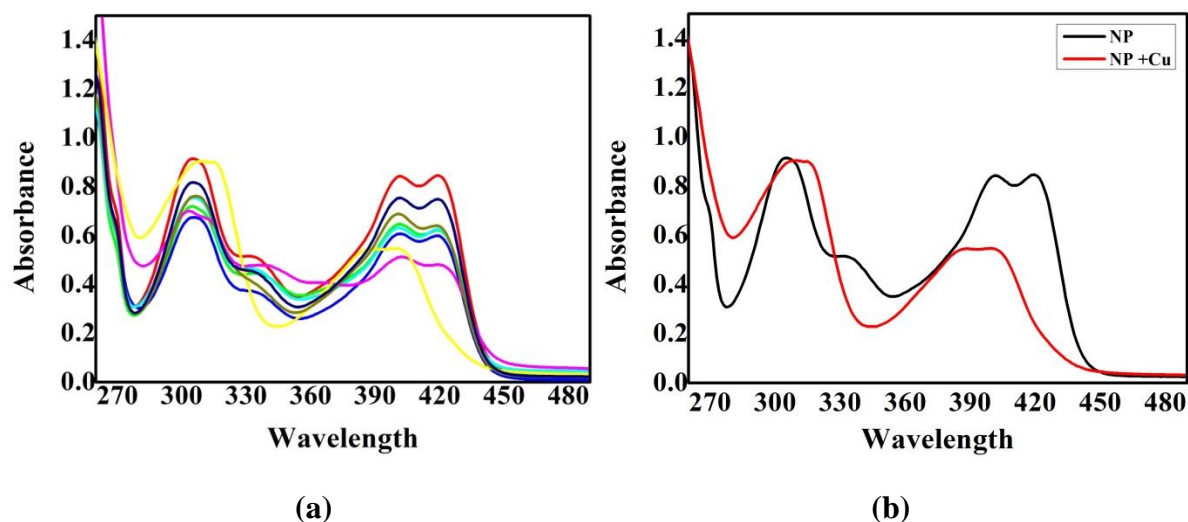


Fig. 6: (a) Absorption spectra of **NP** (76μM) with different metal ions (10⁻⁵M) (b) Absorption spectra of Schiff base **NP** and **NP**+Cu²⁺ ions.

The absorption band at 410 nm gets disappeared in the case of addition of Cu²⁺ ions. Color and spectral changes suggested that **NP** can be used as a colorimetric sensor for Cu²⁺ ions. To understand binding interactions amongst metal ion and Schiff base **NP**, UV-Visible titrations were executed with solutions of **NP** and Cu²⁺ ions. Incremental addition of Cu²⁺ ions solution varied from 0 to 1 equivalent to solution of **NP** leading to disappearance of band at 410 nm as shown in **Fig. 7**. The complex formation between **NP** and Cu²⁺ can be explicated via Intramolecular charge transfer process [Zhang et al. (2011), & Yang et al. (2012)].

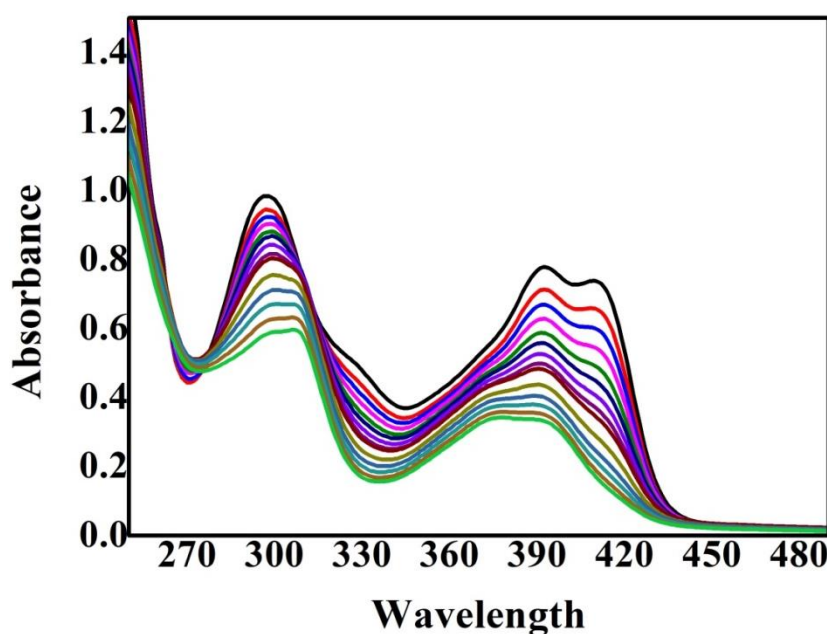


Fig. 7: Absorption changes in **NP** on incremental addition of Cu²⁺ ions solution.

3.2.2. Binding studies

The Job's plot assists in prediction of binding stoichiometry of Metal-Ligand complex [Wang et al. (2006)]. To find out binding ratio amid **NP**-Cu²⁺ ions, Job's plot was diagrammed. An equimolar solution of **NP** and Cu²⁺ ions was prepared and absorption titrations were carried out with changing molar fraction of Cu²⁺ from 0.1 to 0.9 equivalents, maintaining volume of solution constant. Inflection point was obtained near 0.65 indicating formation of a 2:1 complex (**Scheme 2**) between Cu²⁺ ions and ligand **NP** as illustrated in **Fig. 8 (a)**. Stoichiometry further verified by HRMS spectrum, a molecular ion peak at 586.5398 equivalent to [NP+ 2Cu²⁺-2H⁺] as revealed in **Fig. 9**.

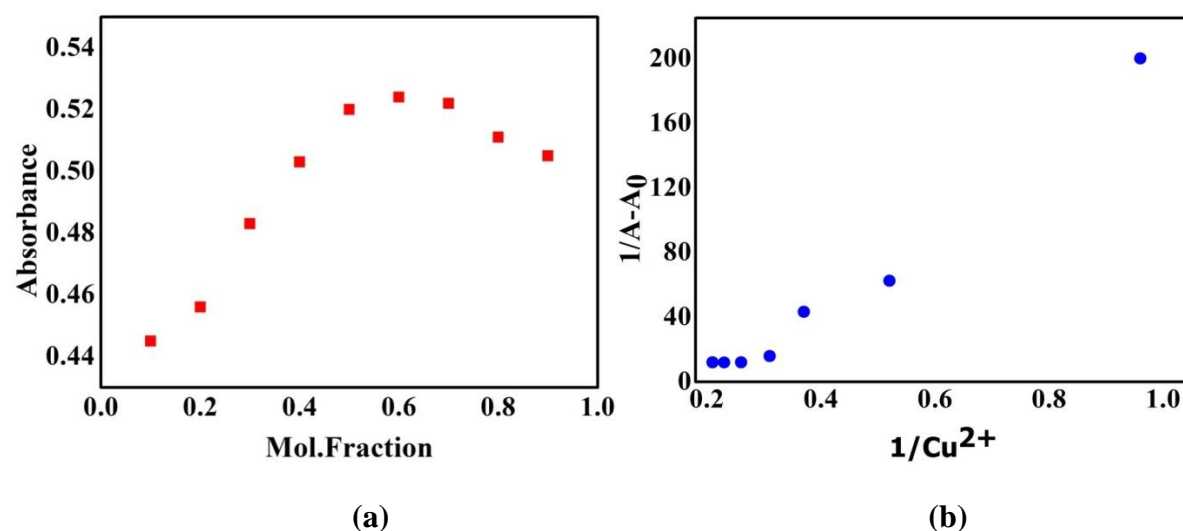


Fig. 8: (a) Changes in absorption intensity of **NP** with varied fraction of cupric ions (b) B-H plot for **NP** with cupric ions.

To determine binding constant, Benesi-Hildebrand equation (Equation-1) was used (K_a) between **NP** and Cu²⁺ ions.

$$1/[A-A_0] = 1/K_a [A_{max}-A_0] [Cu^{2+}] + 1/[A_{max}-A_0] \quad \text{..... (1)}$$

where, K_a is binding constant, A = absorbance in presence of a different concentration of Cu²⁺ ions, A_0 = absorbance of **NP** in absence of Cu²⁺ ions, and A_{max} = maximum absorbance in presence of Cu²⁺ ions. B-H plot (**Fig. 8(b)**) between $1/A-A_0$ and $1/\text{conc. of } Cu^{2+}$ ions was delineated and binding constant (K_a) was calculated to be $12.1 \times 10^5 \text{ M}^{-1}$.

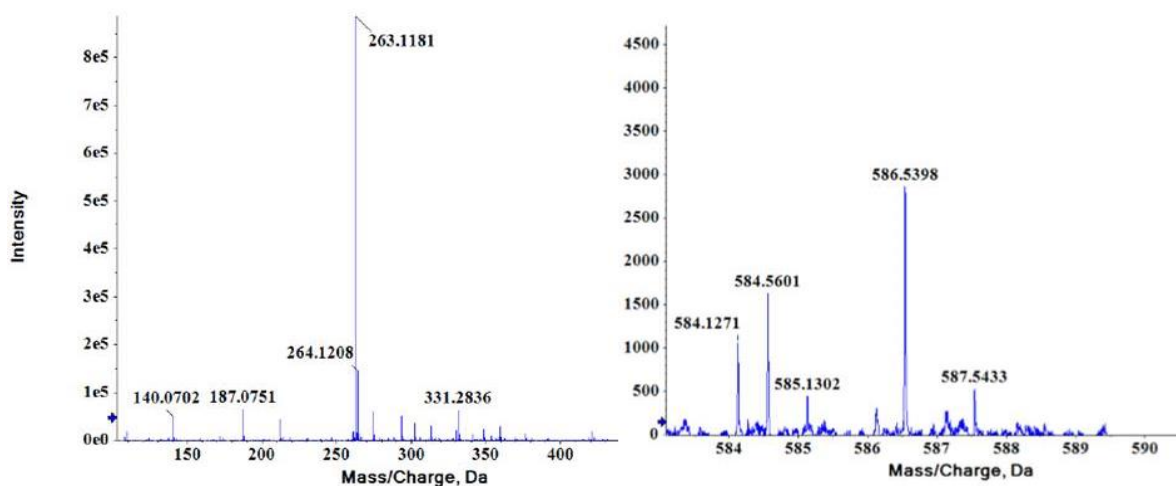
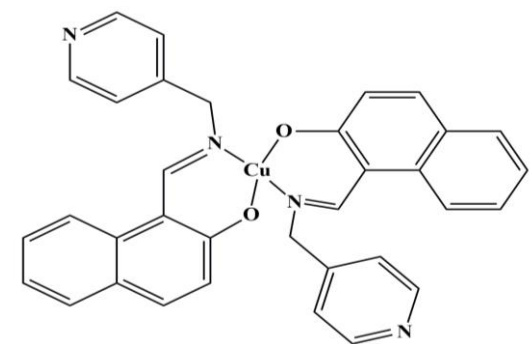


Fig. 9: Changes in Mass spectrum of **NP** on addition of Cu^{2+} ions.



Scheme 2: Estimated binding framework among **NP** and Cu^{2+} ions.

To compute limit of detection (LOD), following equation-2 was used:

$$\text{LOD} = 3\sigma / K_a \quad \dots\dots\dots (2)$$

where K_a is binding constant and σ denotes standard deviation. Detection limit was calculated to be $10.4 \times 10^{-8} \text{ M}$.

3.2.3. Interference experiments

Interference experiments were conducted for the selectivity of **NP** towards Cu^{2+} ions, with various metal cations (10^{-5} M) (Cr^{3+} , Ni^{2+} , Mn^{2+} , Cd^{2+} , Fe^{3+} , Zr^{2+} , Co^{2+} , Zn^{2+} , Hg^{2+} , and Ag^{+}). Bar graph in **Fig. 10** demonstrated wavelength shift in absorbance band at 298 nm for **NP** with different metal ions discretely with and without Cu^{2+} ions. Results proposed that Schiff base **NP** work exclusively for Cu^{2+} ions with insignificant interference from other intruding cations.

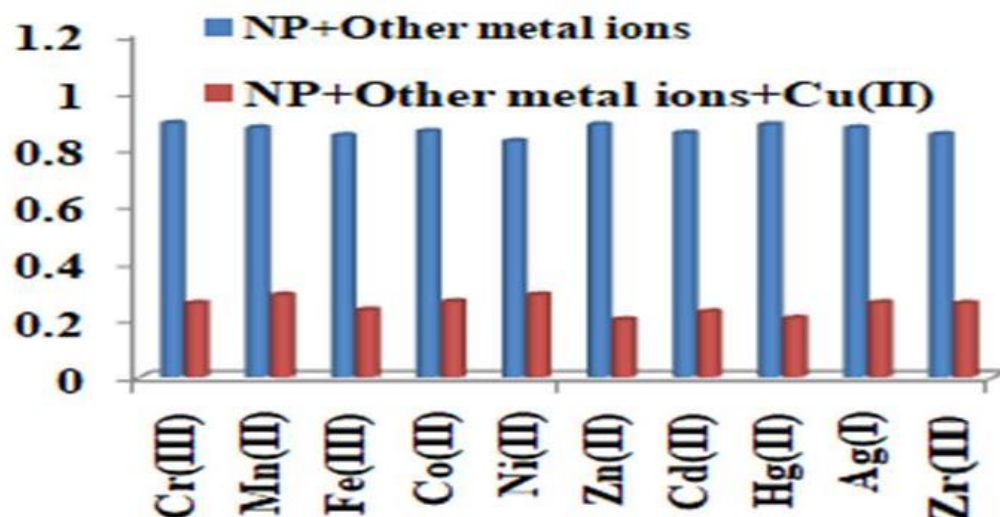


Fig. 10: Selectivity of NP towards cupric ions in terms of interference study at 401 nm.

3.2.4. Optical stability

The **Fig. 11** shows time-dependent stability of probe NP and NP with Cu^{2+} ions in methanol. The absorption intensity varied negligibly with regular interval of time and remains constant for upto 60 minutes. This confirms that probe NP can serve as a sensitive probe to use in environmental sample analysis.

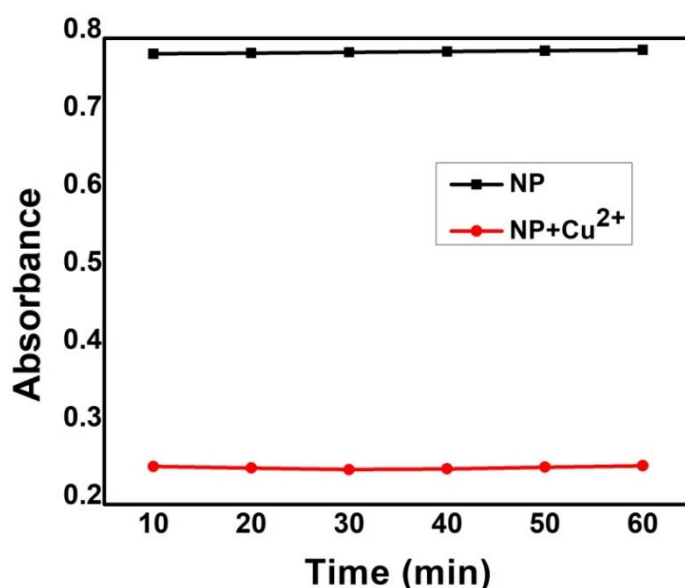


Fig. 11: Changes in absorbance of NP and NP+ Cu^{2+} ions with time intervals.

3.2.5. FE-SEM Analysis

The formation of complex was further ensured via FE-SEM analysis and SEM images for ligand NP and NP- Cu^{2+} complex were recorded. To record images, NP was taken solid while NP- Cu^{2+} solution was put under sonication upto 20 minutes and further centrifugated. The agitated solution was then obtained on watch glass and left for evaporation. Then the obtained solid was subjected to instrument

and FE-SEM images were obtained. The change in morphology of Schiff base **NP** was detected in images of sample with **NP**+Cu²⁺ ions (**Fig. 12** and **13**).

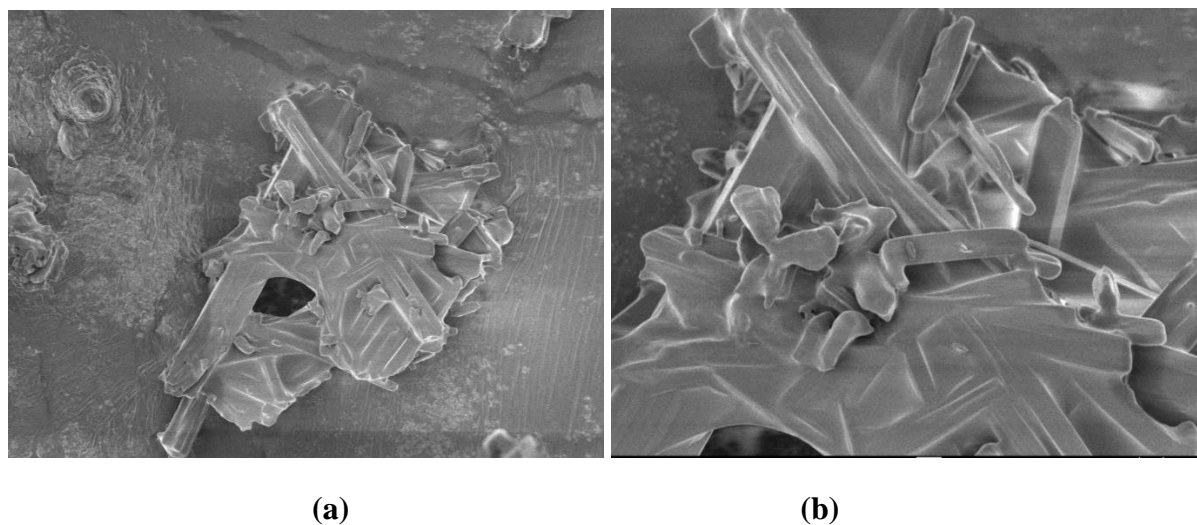


Fig. 12: FE-SEM image of **NP** (a) and (b) at low and high resolution correspondingly.

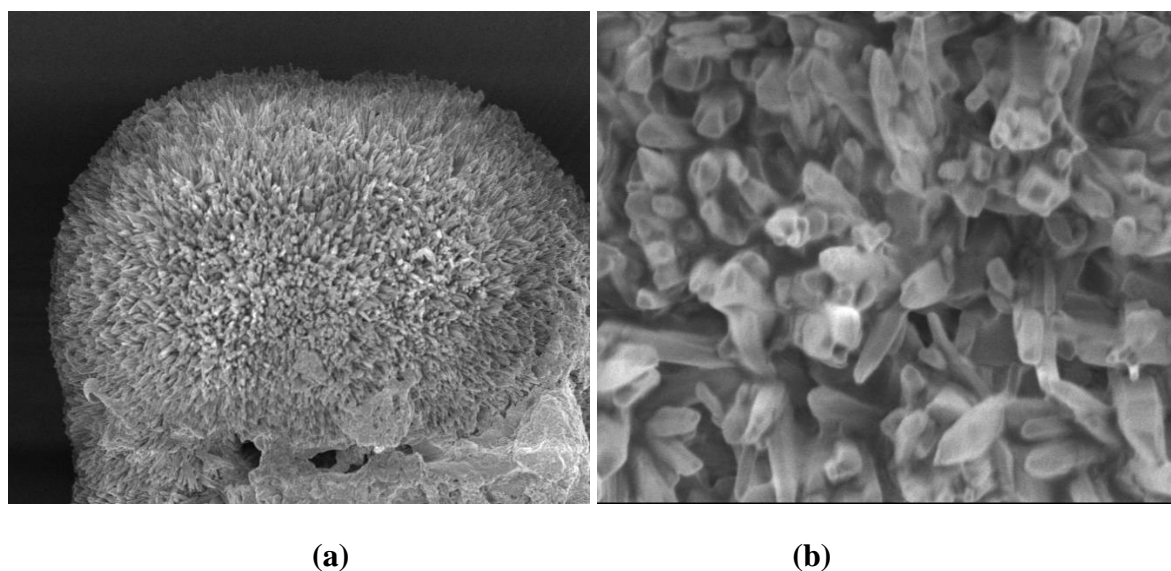


Fig. 13: (a) and (b) represents morphological changes in **NP** with Cu²⁺ ions at low and high resolution consecutively.

3.2.5. DFT computational studies

All calculations were performed with B3LYP functional Gaussian09 software [Frisch et al. (2009)]. Geometrical optimization was done using basis sets 6-311G (d,p) for smaller atoms C, N, H, and O, and LANL2DZ for Cu metal [Dunning et al. (1976), Hay et al. (1985), & Pietro et al. (1982)]. To endorse minima on potential energy surface (PES) and determine free energy changes, frequency computations were carried out on optimized structures. Optimized structure for ligand **NP** and its copper complex are presented in **Fig. 14**.

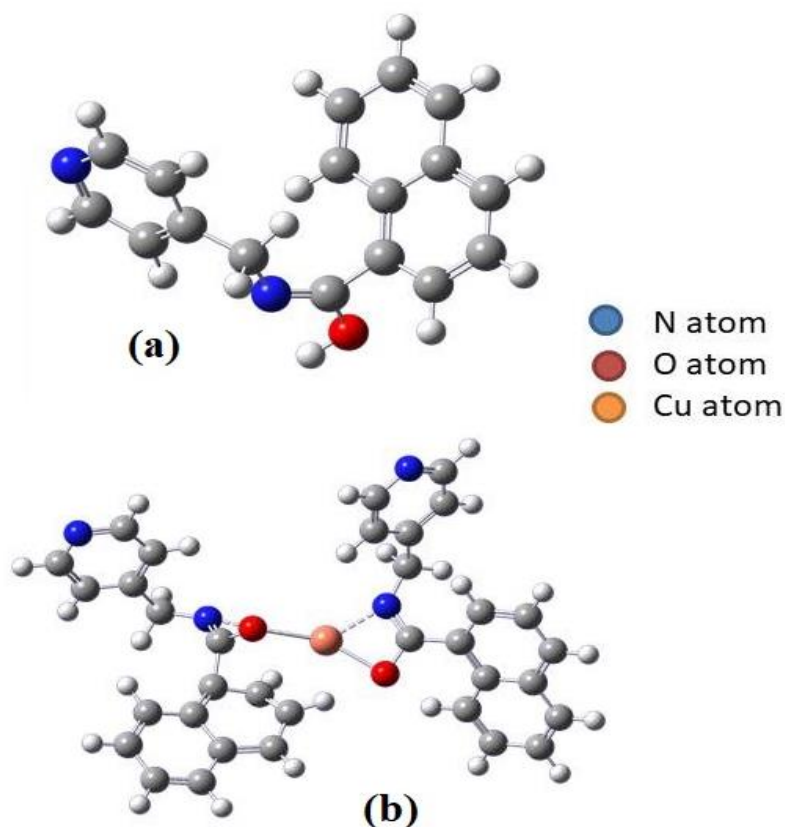


Fig. 14: Optimised structure of free ligand **NP** (a) and **NP-Cu²⁺** complex (b).

Frontier molecular orbitals (HOMO and LUMO) of **NP** and its complex are drawn in **Fig. 15**. Energy gap between HOMO and LUMO are provided in **Table 1**, energy gap decreased with complexation indicating complex stability. The HOMO designates highest energy orbital which serves as an electron donor, its energy directly influences ionisation energy (I). Likewise, LUMO designates lowest energy orbital serves as an electron acceptor and its energy directly affects electron affinity (A). Hence, from Koopman's theorem, $I = -E_{\text{HOMO}}$ and $A = -E_{\text{LUMO}}$, I and A were calculated by using E_{HOMO} and E_{LUMO} .

Table 1: E_{LUMO} , E_{HOMO} , and ΔE values			
	E_{HOMO} (eV)	E_{LUMO} (eV)	ΔE (eV)
NP	-0.24	-0.06	0.18
NP-Cu²⁺	-0.23	-0.09	0.14

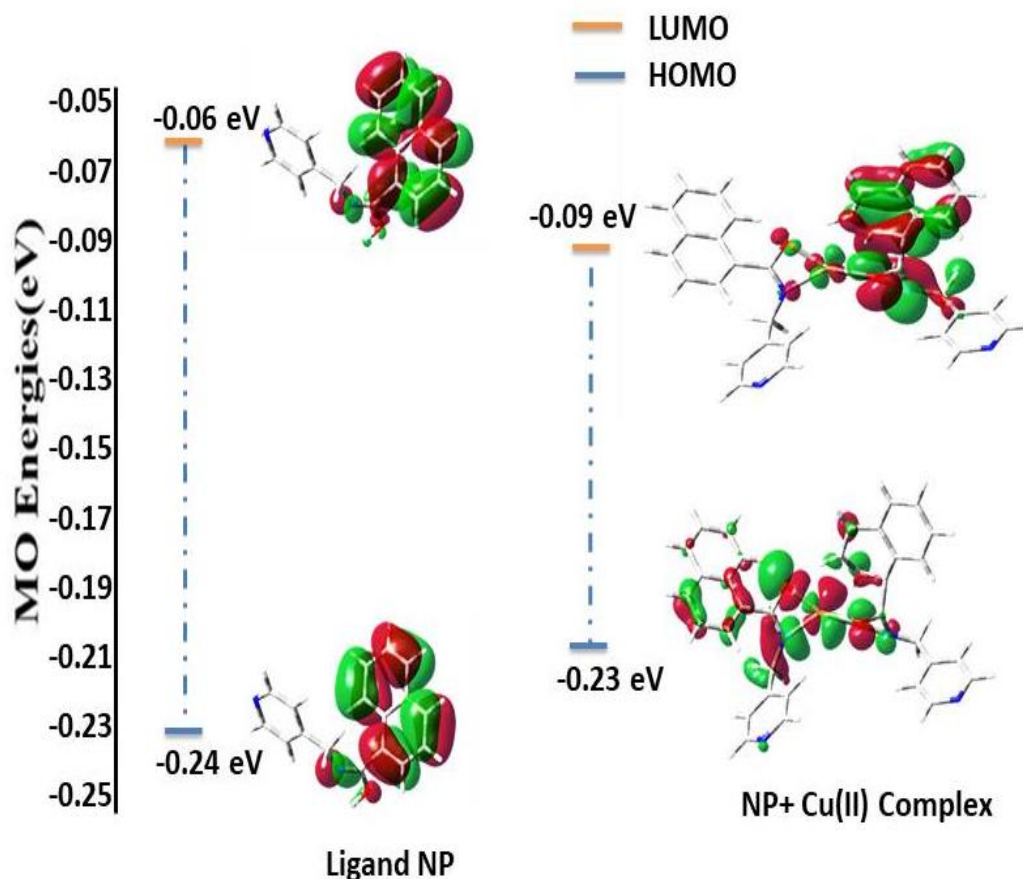


Fig. 15: HOMO-LUMO energy diagram for free ligand **NP** and its Cu^{2+} complex.

Chemical hardness (η) tells about the changes in electronic distribution of probe which directly linked with reactivity and stability of a molecule. Reactivity gets decreased on increase in chemical hardness while chemical stability increased. Moreover, electrophilicity index (ω), softness (S), electronegativity (χ), and chemical potential (μ), can also describe stability and reactivity of a molecule. These values are intended in **Table 2**.

Table 2: Quantum Parameters		
Parameter	NP	NP-Cu²⁺
I (eV)	0.24	0.23
A (eV)	0.06	0.09
χ (eV)	0.15	0.16
η (eV)	0.09	0.07
S (eV) ⁻¹	5.56	7.14
μ (eV)	-0.15	-0.16
ω (eV)	0.13	0.18

4. CONCLUSION

So, herein, a naphthaldehyde based Schiff Base ligand **NP** was synthesized and well characterized that can work for cupric ions detection with great selectivity and sensitivity without undergoing in any influence of other metal cations. **NP** showed a visual color change along with significant shifts in UV-Vis absorption bands onto the addition of Cu (II) ions. Remarkably, Cu (II) ions have ability to coordinate easily with wide range of ligands has sites such as N and O. This justifies the facile bonding of cupric ions with N atom of 'imine' group and O atom of 'hydroxyl' group of naphthalene unit. Furthermore absorption titration studies, jobs plot, and HR-MS indicated 2:1 stoichiometric ratio between **NP** and Cu (II) ions respectively. The prepared Schiff Base **NP** has low LOD value of 10.4×10^{-8} M. The experimental findings were finally supported by the theoretical DFT calculations.

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SURVEY OF DEEP LEARNING AND MACHINE LEARNING TECHNIQUES FOR BONE MARROW TRANSPLANT BY USING META HEURISTICS OPTIMIZATION AND CLASSIFICATION TECHNIQUES

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Bone marrow is involved in various haematological and non-haematological conditions in the paediatric age group. To understanding and analyse underlying etiology, bone marrow examination, including both bone marrow aspiration and trephine biopsy, forms an important diagnostic tool. It helps to differentiate proliferative disorders of the myeloid and lymphoid series, find out their prognosis based on severity, and assess their status before therapy is started. It also aids in staging and in the detection of infiltration of the marrow by foreign cells. The spectrum of disorders affecting the marrow in children ranges from common disorders like nutritional deficiency anaemia to serious conditions like leukaemia. The present study was conducted to analyse the causes of thrombocytopenia its spectrum and to interpret the bone marrow aspiration findings. Bone marrow aspiration smears were stained with Leishman stain and examined under light microscope. Eighty-five cases fulfilled the criteria of thrombocytopenia. Mean age of patients was 27.3 years. Maximum number of cases was seen in age group of below 15 years. The most important techniques used for the diagnosis of haematological disorders are bone marrow aspiration and trephine biopsy which are complementary to each other.

Keywords - Bone marrow, UCI dataset or Kaggle data set. optimization techniques, feature extraction.

1. INTRODUCTION

Healthcare practices include collecting all kinds of patient data which would help the doctor correctly diagnose the health condition of the patient. These data could be simple symptoms observed by the subject, initial diagnosis by a physician or a detailed test result from a laboratory. Thus, these data are only utilized for analysis by a doctor who then ascertains the disease using his/her personal medical expertise Few diseases classification framework have been proposed in the literature for healthcare However, to the best of our knowledge, there is no comprehensive framework in the literature which depicts the process of diabetes data analytics from domain understanding to system deployment. Disease prediction is a classification problem, where the input features variables are the risk factors. we propose an intelligent diagnostic system for disease classification using embedded model, as support for allied health professionals, consisting of doctors, dieticians, medical technologists, therapists and pathologists, for better diagnosis and prognosis of diseases, for better patient care The Diagnostic System helps stakeholders, such as insurance companies, pharmaceutical firms and the government to put in place a preventive plan and an effective healthcare strategy.

2. LITERATURE REVIEW

In this paper, I have reviewed more than 40 research papers which are downloaded from Elsevier, IEEE, science direct websites, JAALAS journal websites and others. Reviews of these are as follow:

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Ratul et al. (2022) used In recent times, ML techniques have been extensively exploited for diagnosis, prognosis, and therapeutics in the healthcare sector. Its applications are not limited to treatment procedures; rather, they are expeditiously gaining traction in a variety of research fields. In a narrative review, Nathan et al. highlighted essential ML concepts for novice readers, discussed the applicability of ML in hematology-related malignancies, and indicated key points for practitioners to consider before evaluating ML studies. Vibhuti et al. also conducted a comparative evaluation of ML methods utilized in the discipline of HSCT, examining the categories of data flows incorporated, designated ML algorithms used, and therapeutic consequences monitored. On the other hand, patients with acute leukemia (AL) undergoing HSCT from unrelated donors exhibit a plethora of variations, even after rigorous genetic matching.

Bakrawy et al. (2022) proposed that the survival prediction of children undergoing hematopoietic stem-cell transplantation is essential for successful transplantation. However, the performance of current algorithms for predicting mortality in this patient group has not improved over recent decades. This paper proposes a new feature selection technique for survival prediction problems using the Mud Ring Algorithm (MRA). Experiments and tests were initially performed on 13 real datasets with varying occurrences to compare the suggested algorithm with other algorithms. After that, the constructed model classification performance was compared to other techniques using the bone marrow transplant children's dataset. This research proposes the MRA algorithm applied to the SVM classifier as a feature selection algorithm to find the optimal features. Thirteen real-world datasets are taken into account to assess the performance of our proposal. The tested datasets were chosen from the UCI Machine Learning repository.

Caiyan et al. (2022) used the artificial neural network (ANN) was used to establish the sturgeon bone marrow drying model. Further, the effects of different temperatures (40, 60, and 80°C), humidities (0, 20, and 40%), and air velocities (8, 16, and 25 m/s) on the drying characteristics of sturgeon bone marrow were studied. The studies had shown that with the increase of drying temperature, the acceleration of air velocity, and the decrease of humidity, the sturgeon bone marrow can be dried in the shortest period of 100 min.

Centeno et al. (2021) have formed the aim of this article is to report findings from a survey administered using the Delphi technique to a group of physicians using bone marrow concentrate in practice to determine best practice consensus regarding optimization of patient safety and education. The Delphi technique was carried out with 4 rounds of questioning delivered electronically via Survey Monkey. Participants were provided up to 4 reminders to complete the survey. Those who failed to respond at that point were dropped from the panel to ensure that the panel participants had an uninterrupted series of questionnaires. After the close of the survey, the anonymized aggregate results of each round were shared with the group prior to voting in the next round in accordance to the Delphi process prior to opening of the subsequent survey.

Dhanalakshmi et al. (2020) proposed to study the morphology and spectrum of bone marrow in hematological diseases, in cases of Pancytopenias to determine the etiology and also to study the bone marrow morphology in isolated splenomegaly cases presenting as haematological disorder. In the present study, bone marrow was hypercellular with predominantly megaloblastic erythropoiesis. Giant metamyelocytes were evident in 10 cases. Megakaryocytes were normal or decreased and of normal morphology.

Li et al. (2020) have found Allogeneic hematopoietic stem cell transplantation (HSCT) is used to treat patients with a range of malignant and nonmalignant hematologic disorders as well as other specific disorders of the immune system. The improvement in outcomes after HSCT using unrelated donors (UDs) and the development of novel nontoxic preparative regimens make UD HSCT an option for patients who do not have an HLA-matched sibling. The models were trained and tested using a set of features extracted from the blood donor management system, the BBMR stem cell donor laboratory information management system (LIMS) system, and the 2011 UK Census that captures donor information such as demographics, blood donation activities, medical deferrals, education background, and socioeconomic status.

Nadeem et al. (2020) have found Deep learning is a quite useful and proliferating technique of machine learning. Various applications, such as medical images analysis, medical images processing, text understanding, and speech recognition, have been using deep learning, and it has been providing rather promising results. Both supervised and unsupervised approaches are being used to extract and learn features as well as for the multi-level representation of pattern recognition and classification. Hence, the way of prediction, recognition, and diagnosis in various domains of healthcare including the abdomen, lung cancer, brain tumor, skeletal bone age assessment, and so on, have been transformed and improved significantly by deep learning.

Papadimitriou et al. (2020) propose that Multiple myeloma (MM) remains incurable despite the abundance of novel drugs. As it has been previously shown, preclinical 2D models fail to predict disease progression due to their inability to simulate the microenvironment of the bone marrow. In this review, we focus on 3D models and present all currently available ex vivo MM models that fulfil certain criteria, such as development of complex 3D environments using patients' cells and ability to test different drugs in order to assess personalized MM treatment efficacy of various regimens and combinations.

Torres et al. (2019) have found Hematopoietic stem cell transplantation is used as a lifesaving therapy for a diversity of pediatric diseases. The procedure is associated with considerable mortality; however, better conditioning regimens and better supportive treatments have reduced the nonrelapse mortality and more neoplastic and non-neoplastic conditions are now considered for transplantation. In our population two of three children receiving HSCT and admitted to PICU survived. Graft vs. host disease, need of mechanical ventilation, unrelated transplantation and previous malnutrition were predictors of mortality.

Tuzovic et al. (2019) proposed the Due to advancements in oncologic treatment strategies and techniques, the number of survivors who have undergone hematopoietic stem cell transplant (HCT) continues to increase in the United States; this number is projected to reach 502,000 by the year

2030. There is significant interest within the field of cardio-oncology to identify cardiotoxicity and cardiovascular disease in the HCT population.

Hagmarker¹ et al. (2019) this study aimed to compare different image-based methods for bone marrow dosimetry and study the dose–response relationship during treatment with ¹⁷⁷Lu-DOTATATE in patients with and without skeletal metastases. included 46 patients with advanced neuroendocrine tumors treated with at least 2 fractions of ¹⁷⁷Lu-DOTATATE at Sahlgrenska University Hospital. High- and low-uptake compartments were automatically outlined in planar images collected at 2, 24, 48, and 168 h after injection. The bone marrow absorbed doses were calculated from the cross doses of the high- and low-uptake compartments and the self-dose, using the time–activity concentration curve for the low-uptake compartment.

Simpson, et al. (2019) have found Clinical bone marrow transplantation started in 1957 at a time when remarkably little was known about hematopoietic stems cells, immune responses to transplants or the identity of transplant antigens. This review will delineate the substantial increase in knowledge about these three areas gained between then and 1992 when the Ceppellini School course on Bone Marrow Transplantation was held, along with the progress made in clinical application. Reducing the incidence and severity of GVHD following HSC transplant remains the biggest challenge for both existing patients and the possibility of extending this treatment to additional diseases.

Raiola et al. (2018) have found Human leukocyte antigen (HLA) compatibility is the crucial requirement to perform an allogeneic hematopoietic stem cell transplantation (HSCT) and remains the most meaningful predictor of long-term survival. Indeed, in patients undergoing HSCT, the number of mismatched HLA is associated with higher rates of graft-versus-host disease (GVHD) and of nonrelapse mortality (NRM). Association of mismatch and other demographic and clinical characteristics with OS was assessed using the univariable semiparametric Cox regression model, whereas the Fine and Gray model for competing risk was adopted to test the association with cumulative incidence of aGVHD, cGVHD, relapse, and NRM.

Sadona et al. (2018) proposed that Pulmonary complications (PCs) are a significant cause of morbidity and mortality in hematopoietic stem cell transplant (HSCT) recipients. Pulmonary infiltrates in such patients pose a major challenge for clinicians because of the wide differential diagnosis of infectious and noninfectious conditions. It is rare for the diagnosis to be made by chest radiograph, and commonly these patients will need further invasive and noninvasive studies to confirm the etiology of the pulmonary infiltrates. The aim of this research was to study the pattern of lower respiratory tract infection within the first year after HSCT. HSCT is considered now the best therapeutic option for many hematological and nonhematological malignancies. However, PCs, either infectious or noninfectious, remain a major problem after HSCT.

Alsaleh (2018) have found With acute myeloid leukemia (AML), there are limited data about the accuracy of day 14 bone marrow (BM) biopsies for predicting complete remission as compared to day 28 BM biopsy results. We here aimed to estimate the correlation between, and the diagnostic accuracy of, both approaches. We reviewed the charts of all patients between the ages of 18 and 60 years with morphologically confirmed and previously untreated AML who received chemotherapy at our academic institution over a 13 year period.

Bacigalupo et al. (2016) proposed the Standard front-line treatment for acquired aplastic anemia (AA) for patients is either immunosuppressive therapy (IST) or bone marrow transplantation (BMT), usually from an HLA identical sibling. This study shows very encouraging outcome data in a large cohort of patients with SAA. Results are gradually improving and current advances, such as the use of eltrombopag in IST, and better platforms for alternative donor transplants, including better donor selection, are paving the way for further improvement in patients treated beyond 2010.

Xiang (2016) have found Decellularized liver matrix (DLM) hold great potential for reconstructing functional hepatic-like tissue (HLT) based on reseeded of hepatocytes or stem cells, but the shortage of liver donors is still an obstacle for potential application. Therefore, an appropriate alternative scaffold is needed to expand the donor pool. In this study, we explored the effectiveness of decellularized spleen matrix (DSM) for culturing of bone marrow mesenchymal stem cells (BMSCs), and promoting differentiation into hepatic-like cells. Rats' spleen were harvested for DSM preparation by freezing/thawing and perfusion procedure. Then the mesenchymal stem cells derived from rat bone marrow were reseeded into DSM for dynamic culture and hepatic differentiation by a defined induction protocol.

Chu (2015) proposed the cartilage repair potential and multipotency of bone marrow-derived stem cells has been well described. Harnessing this potential for human articular cartilage repair has been both easy, through bone marrow stimulation techniques such as microfracture, and fraught with difficulty in showing consistent and clinically meaningful improvement over microfracture using additional processing to isolate.

Makris et al. (2015) used the total RM dose estimates derived from plasma- and imagebased approaches are equal within 6%. For dosimetry purposes in immuno-PET this would be acceptable. Nevertheless, an imagebased approach, using manual delineation of the LV, is preferred for determining RM dose estimates, because it accounts for a nonconstant RMPR.

Teixeira et al. (2015) proposed the Allogeneic hematopoietic stem cell transplantation (AHSCT) is a potentially curative treatment option for different hematological malignancies and non-malignant diseases. Modifications in immunosuppressive therapies, improvements in clinical supportive care, and introduction of reduced-intensity conditioning (RIC) regimens have led to an increased indication of transplant to patients who were otherwise not previously eligible for AHSCT with a myeloablative conditioning regimen (MA), such as the elderly.

Atla et al. (2015) have found Bone marrow examination is useful in the diagnosis of both hematological and non-hematological disorders. The two most important techniques used for the diagnosis of hematological disorders are bone marrow aspiration and trephine biopsy which are complementary to each other. The present study is to evaluate the findings of bone marrow aspiration & trephine biopsy and their cytological and histological patterns in various hematological disorders. The aim of the study is to evaluate the clinical profile, spectrum, cytological and histological pattern of various hematological disorders reported in bone marrow aspiration and trephine biopsy respectively. It was a cross-sectional study design with 105 patients who underwent bone marrow examination for evaluation of hematological disorders.

Saad et al. (2014) have used the Autologous hematopoietic stem cell transplantation (AHCT) improves survival in patients with multiple myeloma (MM) but is associated with morbidity and non-relapse mortality (NRM). Hematopoietic cell transplant comorbidity index (HCT-CI) was shown to predict risk of NRM and survival after allogeneic transplantation. We tested the utility of HCT-CI as a predictor of NRM and survival in patients with MM undergoing AHCT. We analyzed outcomes of 1156 patients of AHCT after high-dose melphalan (MEL) reported to the Center for International Blood and Marrow Transplant Research (CIBMTR).

Sandström et al. (2013) have proposed A method based on repeated whole-body imaging in combination with blood and urinary activity data over time was developed to determine the absorbed dose to the bone marrow. The dose-limiting organ was the kidney in 197 of 200 patients. In 50% of the patients, more than 4 cycles of 7.4 GBq of ¹⁷⁷Lu-octreotate could be administered, whereas 20% of the subjects were treated with fewer than 4 cycles. Individualized absorbed dose calculation is essential to optimize the therapy.

Dupuis (2013) approved This prospective study aimed to validate a previously developed first-dose limited sampling strategy (LSS) to predict the area under the cyclosporine concentration-versus-time curve (AUC) and to develop and then validate an LSS to predict cyclosporine AUC at steady state. Using complete pharmacokinetic profiles collected prospectively, we developed and validated LSSs for predicting AUC of cyclosporine after administration as a 2-hour i.v. infusion to children undergoing HSCT both after the first dose and at steady state. Specifically, we found that a 3-point LSS is a valid method for estimating cyclosporine AUC after both the initial i.v. cyclosporine dose and at steady state. This information will facilitate assessment of cyclosporine AUC by clinicians and the assessment of the relationship, if any, between cyclosporine AUC and HSCT outcomes in future studies.

Locatelli et al. (2013) used to Data concerning patient, donor, and disease characteristics, as well as transplantation outcome, were collected using a standardized questionnaire of the EUROCORD Registry for each patient enrolled into this study. This study included all patients with a diagnosis of either TM or SCD, who received family donor CBT between January 1994 and December 2005 in participating institutions. Patients given CB cells associated to BM cells were not included in this study.

Anasetti et al. (2012) proposed that the transplantation of filgrastim-mobilized peripheral-blood stem cells from HLA-identical siblings accelerates engraftment but increases the risks of acute and chronic graft-versus-host disease (GVHD), as compared with the transplantation of bone marrow. Some studies have also shown that peripheral-blood stem cells are associated with a decreased rate of relapse and improved survival among recipients with high-risk leukemia. conducted a phase, multicenter, randomized trial of transplantation of peripheral-blood stem cells versus bone marrow from unrelated donors to compare 2-year survival probabilities with the use of an intention-to-treat analysis.

Giuliano et al. (2011) have found To determine the association between survival and metastases detected by immunochemical staining of SLNs and bone marrow specimens from patients with early-stage breast cancer. Among women receiving breast-conserving therapy and SLN dissection,

immunohistochemical evidence of SLN metastasis was not associated with overall survival over a median of 6.3 years, whereas occult bone marrow metastasis, although rare, was associated with decreased survival.

Raje et al. (2011) proposed Current clinical trials are studying the benefits of combination strategies such as BAFF inhibitors and bortezomib, or DKK1-neutralizing antibodies and bisphosphonates. Novel agents with dual activity on bone remodeling, such as ACE-011, may also result in improvement of bone disease besides prevention of osteolytic lesions.

Markway (2010) found that the feasibility of creating micropellets of BM-MSCs in the AggreWell™ plates was evaluated by varying the number of cells per well from 2×10^5 to 1×10^4 . We found that consistent aggregates could be formed under both 20% and 2% O_2 using 2×10^5 cells/well, a common number of MSCs used in conventional pellet culture. At this density, aggregates formed under both oxygen environments within 14 days, albeit with different morphologies.

Gupta et al. (2010) found Transplantation from an HLA-matched sibling is the treatment of choice for young patients with acquired severe aplastic anemia. For older patients, the acceptable upper age limit for transplantation as first-line treatment varies. The current analysis, therefore, sought to identify age or ages at transplantation at which survival differed. We studied the effect of patients' age, adjusting for other significant factors affecting outcomes, in 1307 patients with severe aplastic anemia after HLA-matched sibling transplantation using logistic and Cox regression analysis. Age categories (40 years) were determined using Martingale residual plots for overall survival and categories based on differences in survival.

Basso et al. (2009) used to Speed of blast clearance is an indicator of outcome in childhood acute lymphoblastic leukemia (ALL). Availability of measurement of minimal residual disease (MRD) at an early time point with a reduced-cost method is of clinical relevance. In the AIEOP-BFM-ALL (Associazione Italiana Ematologia Oncologia Pediatrica and Berlin-Frankfurt-Münster Study Group) 2000 trial, patients were stratified by levels of polymerase chain reaction (PCR) MRD at day 33 and 78. AIEOP studied the prognostic impact of MRD measured by flow cytometry (FCM) at day 15 of induction therapy. Patients and Methods Bone marrow samples from 830 Italian patients were collected on day 15, after 14 days of steroids, and one dose of intrathecal methotrexate, vincristine, daunorubicine, and asparaginase. Cells were analyzed by four-color FCM for detection of leukemia-associated immunophenotypes.

Krishna et al. (2009) proposed Stem cells are the centre for regenerative medicine. Given a right signal these undifferentiated cells have a remarkable potential to develop into specialized cell types (blood cells, heart cells etc.) in the human body. Stem cells, therefore, can be used in cell-based therapies to replace/repair damaged tissues and/or organs. Ongoing research in the area of stem cells focuses on their potential application (both embryonic stem cells and adult stem cells) to create specialized cells and replace the damaged ones. Hence, this cutting-edge technology might lead to new ways of detecting and treating diseases. Stem cell transplantation can be considered as an option for the treatment of certain type of cancers. This medical procedure can also be used to treat neurological diseases, autoimmune diseases, heart diseases, liver diseases, metabolic disorders,

spinal cord injury etc. The present review, therefore, focuses on the growing use of stem cell transplantation in regenerative medicine to treat a variety of diseases. This review also provides the current status of the field with a particular emphasis on bone marrow transplantation. The human neural stem cells may be cultured, genetically modified, and transplanted to restore normal function of the brain. Currently, scientists are attempting to use stem cells to make dopamine producing neurons. Stem cells might one day be programmable to replace the dead cells with healthy ones – providing a step forward in stem-cell based treatment for Parkinson's disease.

Wiener et al. (2007) proposed the Hematopoietic Stem Cell Transplant (HSCT) represents the second most frequent major organ transplant in the United States. Compared to other family members, siblings are more likely to be immunologically matched with the recipient and therefore are often the most suitable donors. Due to a dearth of information on the positive and adverse effects of HSCT on pediatric sibling donors, we sought to examine available data. In this review were identified through a search of the following online databases: PubMed, PsychINFO, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Social Sciences Citation Index (SSCI), using the key words “pediatric,” “sibling,” “stem cell,” “donor,” “social,” “psychological adjustment,” “psychosocial adjustment,” and “cancer.”

Parmar et al. (2007) in this review the interaction of stem cells with their bone marrow microenvironment is a critical process in maintaining normal hematopoiesis. We applied an approach to resolve the spatial organization that underlies these interactions by evaluating the distribution of hematopoietic cell subsets along an in vivo Hoechst 33342 (Ho) dye perfusion gradient. Cells isolated from different bone marrow regions according to Ho fluorescence intensity contained the highest concentration of hematopoietic stem cell (HSC) activity in the lowest end of the Ho gradient (i.e., in the regions reflecting diminished perfusion). The stem cell niche consists of a specialized microenvironment that nurtures and regulates the stem cell pool. Previous reports have focused on the endosteal region of the bone marrow as being the principal site of the stem cell niche involved in hematopoiesis (5, 6) where the restrictive role of angiopoietin and osteopontin molecular interactions with neighboring osteoblasts have been revealed in maintaining HSC quiescence (7, 34, 35), although the association of HSCs with sinusoidal endothelium has been recently proposed as an additional or alternative site for the niche in this tissue (36).

Jones (2006) purpose To study the biology of rare bone marrow (BM) multipotent mesenchymal stromal cells (MSCs), recognized protocols are needed. Colony-forming unit-fibroblast (CFU-F) assays have historically been used for the enumeration of MSCs. However, the need to isolate and further analyze MSCs requires new strategies based on cell surface markers. The purpose of this work was to verify the phenotype of BM MSCs in vivo and to develop flow cytometry-based methods for their evaluation. Pre-enrichment with D7-FIB-conjugated microbeads, cell sorting for CD45^{low}D7-FIB⁺ LNGFR⁺ cells, and CFU-F assay were used to confirm the phenotype of BM MSCs in vivo. Further phenotypic characterization of MSCs was performed using three-color flow cytometry following pre-enrichment or by direct four-color flow cytometry.

Ejbjerg et al. (2005) have found To evaluate a low field dedicated extremity MRI unit for detection of bone erosions, synovitis, and bone marrow oedema in wrist and metacarpophalangeal (MCP) joints, with a high field MRI unit as the standard reference. In 37 patients with RA and 28 healthy

controls MRI of the wrist and 2nd–5th MCP joints was performed on a low field MRI unit (0.2 T Esaote Artoscan) and a high field MRI unit (1.0 T Siemens Impact) on 2 subsequent days. MRI was performed and evaluated according to OMERACT recommendations. Additionally, conventional x ray, clinical, and biochemical examinations were performed. In an initial low field MRI “sequence selection phase”, based on a subset of 10 patients and 10 controls, sequences for comparison with high field MRI were selected.

Longobardi et al. (2005) proposed that Mesenchymal stem cells (MSCs) can be isolated from adult bone marrow (BM), expanded, and differentiated into several cell types, including chondrocytes. The role of IGF-I in the chondrogenic potential of MSCs is poorly understood. TGF- β induces MSC chondrogenic differentiation, although its actions are not well defined. The aim of our study was to define the biological role of IGF-I on proliferation, chondrogenic condensation, apoptosis, and differentiation of MSCs into chondrocytes, alone or in combination with TGF- β and in the presence or absence of TGF- β signaling. Mononuclear adherent stem cells were isolated from mouse BM.

Lewington (2005) have found the case for radionuclide therapy within a multimodality management strategy for metastatic bone pain is strong. Response rates are consistently high, irrespective of the radiopharmaceutical prescribed and treatment is well tolerated, even in heavily pretreated patients.

Seebach et al. (2005) have proposed analysed this observational study included 3103 patients who received allogeneic BMT from 1990 to 1998 and were reported to the Center for International Blood and Marrow Transplant Research by 232 centers.

Zhao et al. (2005) have proposed after 7 to 10 days of culture in endothelial growth medium, BM-MNCs demonstrated a cobblestone appearance typical for endothelial cells and exhibited positivity for a panel of EC markers, including DiI acLDL, UEA-1 lectin staining, and immunostaining for vWF, and Flk-1 varying from 65% to 83%.

3. OTHER REVIEWS

Table 1: Summary of recent research work with accuracy for bone marrow transplant by using meta heuristics optimization and classification techniques.

Year	Author(s)	Technique/Approach	Result(Accuracy)
2005	Zhao et al.	BM-MNCs	UEA-1 lectin staining, and immunostaining for vWF, and Flk-1 varying from 65% to 83%.
2005	Seebach et al.	BMT	Center for International Blood and Marrow Transplant Research by 232 centers.
2005	Lewington	radionuclide therapy	rates are consistently high, irrespective of the radiopharmaceutical prescribed
(2005	Longobardi et al.	MSCs), BM	TGF- β and in the presence or absence of TGF- β signaling
2005	Ejbjerg et al.	MRI	a subset of 10 patients and 10 controls, sequences for comparison with high field MRI were selected
2006	Jones	MSCs	Pre-enrichment with D7-FIB-conjugated microbeads, cell sorting for CD45lowD7-

			FIB+ LNGFR+ cells, and CFU-F assay were used to confirm the phenotype of BM MSCs in vivo.
2007	Parmar et al.	HSC	Cells isolated from different bone marrow regions according to Ho fluorescence intensity contained the highest concentration of hematopoietic stem cell.
2007	Wiener et al.	HSCT	Due to a dearth of information on the positive and adverse effects of HSCT on pediatric sibling donors, we sought to examine available data.
2009	Krishna et al.	Stem cell	Ongoing research in the area of stem cells focuses on their potential application (both embryonic stem cells and adult stem cells) to create specialized cells and replace the damaged ones.
2009	Basso et al.	MRD	Speed of blast clearance is an indicator of outcome in childhood acute lymphoblastic leukemia.
2010	Gupta et al.	HLA	the effect of patients' age, adjusting for other significant factors affecting outcomes, in 1307 patients with severe aplastic anemia after HLA-matched sibling transplantation using logistic and Cox regression analysis.
2010	Markway	MSCs	aggregates could be formed under both 20% and 2% O ₂ using 2×10^5 cells/well.
2011	Raje et al.	BAFF	Novel agents with dual activity on bone remodeling.
2011	Giuliano et al.	SLNs	Overall survival over a median of 6.3 years, whereas occult bone marrow metastasis, although rare, was associated with decreased survival.
2012	Anasetti et al.	stem cells	peripheral-blood stem cells are associated with a decreased rate of relapse and improved survival among recipients
2013	Locatelli et al.	CB	all patients with a diagnosis of either TM or SCD, who received family donor CBT between January 1994 and December 2005 in participating institutions.
2013	Dupuis	LSS	facilitate assessment of cyclosporine AUC by clinicians and the assessment of the relationship
2013	Sandström et al.	Stem Cell	In 50% of the patients, more than 4 cycles of 7.4 GBq of ¹⁷⁷ Lu-octreotate could be administered, whereas 20% of the subjects were treated with fewer than 4 cycles.
2014	Saad et al.	Autologous hematopoietic stem cell transplantation	1156 patients of AHCT after high-dose melphalan (MEL) reported to the Center for International Blood and Marrow

		(AHCT) and multiple myeloma (MM)	Transplant Research.
2015	Atla et al.	Stem Cell	a cross-sectional study design with 105 patients who underwent bone marrow examination for evaluation of hematological disorders.
2015	Teixeira et al.	AHSCT	Modifications in immunosuppressive therapies, improvements in clinical supportive care, and introduction of reduced-intensity conditioning.
2015	Makris et al.	RM	the total RM dose estimates derived from plasma- and imagebased approaches are equal within 6%.
2015	Chu	Stem cell	clinically meaningful improvement over microfracture using additional processing to isolate.
2016	Xiang	DLM, DSM and stem cell	the effectiveness of decellularized spleen matrix (DSM) for culturing of bone marrow mesenchymal stem cells (BMSCs), and promoting differentiation into hepatic-like cells. Rats' spleen were harvested for DSM preparation by freezing/thawing and perfusion procedure.
2016	Bacigalupo et al.	IST	as the use of eltrombopag in IST, and better platforms for alternative donor transplants, including better donor selection, are paving the way for further improvement in patients treated beyond 2010.
2018	Alsaleh	AML	all patients between the ages of 18 and 60 years with morphologically confirmed and previously untreated AML who received chemotherapy at our academic institution over a 13 year period.
2018	Sadona et al.	HSCT	Pulmonary infiltrates in such patients pose a major challenge for clinicians because of the wide differential diagnosis of infectious and noninfectious conditions.
2018	Raiola et al.	HSCT	the number of mismatched HLA is associated with higher rates of graft-versus-host disease (GVHD) and of nonrelapse mortality (NRM).
2019	Simpson, et al.	stems cells	Reducing the incidence and severity of GVHD following HSC transplant remains the biggest challenge for both existing patients and the possibility of extending this treatment to additional diseases.
2019	Hagmarker1 et	stems cells	High- and low-uptake compartments were

	al.		automatically outlined in planar images collected at 2, 24, 48, and 168 h after injection.
2019	Tuzovic et al.	stems cells	this number is projected to reach 502,000 by the year 2030.
2019	Torres et al.	Stem cell	Graft vs. host disease, need of mechanical ventilation, unrelated transplantation and previous malnutrition were predictors of mortality.
2020	Papadimitriou et al.	MM	development of complex 3D environments using patients' cells and ability to test different drugs in order to assess personalized MM treatment efficacy of various regimens and combinations.
2020	Nadeem et al.	ML	the way of prediction, recognition, and diagnosis in various domains of healthcare including the abdomen, lung cancer, brain tumor, skeletal bone age assessment, and so on, have been transformed and improved significantly by deep learning.
2020	Li et al.	HSCT	the 2011 UK Census that captures donor information such as demographics, blood donation activities, medical deferrals, education background, and socioeconomic status.
2020	Dhanalakshmi et al.	Stem cell	Megakaryocytes were normal or decreased and of normal morphology.
2021	Centeno et al.	Delphi technique	After the close of the survey, the anonymized aggregate results of each round were shared with the group prior to voting in the next round in accordance to the Delphi process prior to opening of the subsequent survey.
2022	Caiyan et al.	ANN	the effects of different temperatures (40, 60, and 80°C), humidities (0, 20, and 40%), and air velocities (8, 16, and 25 m/s)
2022	Bakrawy et al.	Mud Ring Algorithm (MRA) and SVM	Experiments and tests were initially performed on 13 real datasets with varying occurrences to compare the suggested algorithm with other algorithms.
2022	Ratul et al.	ML and HSCT	In a narrative review, Nathan et al. highlighted essential ML concepts for novice readers, discussed the applicability of ML in hematology-related malignancies, and indicated key points for practitioners to consider before evaluating ML studies.

4. CONCLUSION

Our review studies aims to support bone marrow transplant The bone marrow absorbed doses differed between the methods studied and between patients with and without metastases. Nevertheless, image-based dosimetry methods, stem cell, machine learning, SVM, DLM, DSM, ML and HSCT, MRA, Delphi technique, ANN, BAFF, SLL, IST, CB, SLNs that increased absorbed doses result in higher platelet toxicity.

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