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Banarsidas Chandiwala Institute
of
Information Technology

**Affiliated to GGSIP University,
Kalkaji, New Delhi.**

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From the Secretary's Desk

I welcome you all to this new edition of BCIIT Magazine. Banarsidas Chandiwala Sewa Smarak Trust Society is working with a mission "To provide yeomen service in the field of Health and Education". BCIIT was created by the Society to fulfill its mission and the societal needs of higher technical education in the developing discipline of Computer Science in 1999. The Society is aware of its responsibility to provide education to the youth of India.

The Society has provided a serene environment of teaching/learning at BCIIT with state of the art infrastructure comprising:

- Wi-Fi Enabled Campus
- MOU with MNC for scholarship
- SPOKEN Tutorial Center by IIT Bombay
- Air Conditioned Classrooms.
- Computer Labs equipped with latest computers and all legal software.
- Air Conditioned Library with Digital Library with latest journals & magazines.
- On campus, well-furnished Hostel.
- Multi-Specialty Campus Hospital

The thrust areas of BCIIT are practical intensive teaching/learning and all round personality development of the students so that they may be ready to accept the challenges of contemporary professional life of IT industry. I am sure that students of BCIIT are well equipped with necessary skills to deliver what is expected from them by the industry.

Dr. Bhuwan Mohan

From the Director'sDesk

I welcome you all to this new edition of BCIIT Magazine. In the information age, science and technology are the corner stone's on which the structure of society rests. The rapid advances in Information and Communication Technologies (ICT) has made the world increasingly hyper- connected and competitive, offering new challenges and opportunities, thus bringing fundamental transformation in society.

The Banarsidas Chandiwala Institute of Information Technology (BCIIT) has taken this unique initiative to encourage the innovative thoughts of its faculty and students to be put in the form of articles in e-magazine. These articles are put on the Institute website so as to be available to more people for their references, use and comments. This e-magazine is a regular annual feature of the Institute since the first issue in 2011. Some of the faculties and students who ultimately wish to pursue the Ph. D program get lot of inspiration and initiate their research in the area of interest.

One of our dreams is to see that BCIIT stands tall among the other institutes of GGSIP University making an impact with value added contributions in the form of high standard and quality articles through its online endeavor. At our end we feel that we have highly experienced and inspired faculty and excellent and academically brilliant students who can contribute a lot in this manner.

I hope our humble effort will go a long way in putting the resourceful thoughts of our faculty and students in improving the quality of education through technology. It is the genuine and sincere attempt of our faculty and students who are constantly putting their heart and soul to achieve the results.

I pray and wish them good luck in their endeavor.

Dr. Ravish Saggar
Director, BCIIT

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An Introduction to Ant Colony and Bee Colony Methods

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Abstract: *Bio inspired methods are increasingly being used in solving many complex problems. Bio inspired methods are the methods which are inspired by the principles of nature and they can be used very efficiently to handle situations which involve uncertainty. Swarm Intelligence is based on generalizations drawn from the behaviour of different organisms. Ant Colony Optimization methods are based on the social behaviour of natural ants. These ants, though almost blind, they very efficiently establish shortest paths between their nest and the food source. ACO methods can be used to solve many optimization and computational problems of computer science. In this paper we study the basic working of ant and bee colony optimization methods and look at some recent works in this area. We can surely say that these two methods provide efficient solutions to may optimization problems*

Keywords: *Bio inspired methods, Swarm Intelligence, Ant Colony Optimization methods, Bee Colony Optimization methods*

I. Introduction to Bio Inspired methods and Swarm Intelligence

Biological inspired methods came to existence around 20 years ago with the development of algorithms that simulate different natural processes to calculate useful results. There are many examples of bio-inspired methods like the neural networks imitate some aspects of learning from brains to learn complex patterns and genetic algorithms use mechanisms from evolution like selection, crossover and mutation to perform complex operations. Many algorithms have since been evolved around bio-inspired computing and they are regularly used in a wide range of real-world problems.

Bio inspired methods are increasingly being used in solving many complex problems. Bio inspired methods are the methods which are inspired by principles of biology and give efficient solutions to many problems. Swarm Intelligence is an emerging paradigm in bio inspired. Swarm Intelligence is based on generalizations drawn from the behavior of different organisms. Ant Colony Optimization is among the most successful swarm based algorithms which captures the behavior of natural ants.

II. Ant Colony Optimization Methods

Ants are social insects which work in highly coordinated way to perform difficult tasks. The social behaviors of ants have been much studied and researchers are finding interesting facts about their behavior. The ant colony models can be used for solving difficult combinatorial optimization problems. Ants have a peculiar behaviour, the ability to find shortest paths, has become the field of ant colony optimization (ACO). Ant Colony Optimization (ACO) is a derivative of Swarm intelligence (SI). The ant colony optimization algorithm (ACO) was first introduced by by Marco Dorigo, in the year 1992 [1]. Since then much interest has been

generated in this field. The main underlying idea, loosely inspired by the behavior of real ants, which are almost blind and yet are able to find the shortest path easily. When traveling from their habitat to food sources an ant deposits a chemical on the surface called the pheromone. The other ants deposit more pheromones as they move over the same path towards the food source. The ant uses the same trail to find its way back to the nest. As the quantity of pheromone increases on a path over time, the ants develops well-trodden paths and other ants simply follow the same path. The ants never need to interact directly, as all the information about the actions of other ants comes from the strength of the pheromone trail. This indirect communication mechanism is called stigmergy.
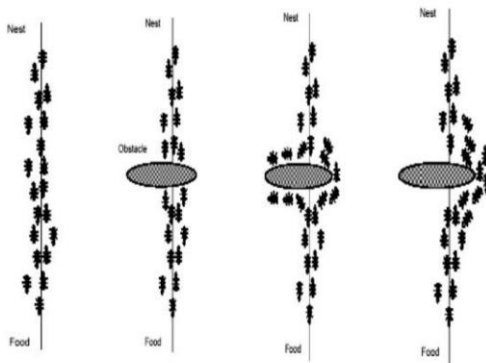

Fig. 1: The natural behavior of ants

An ACO method comprises of three main functions:

1. Solution Construction: This focuses on the solution construction process. Artificial ants are created that change their states as per the transition rules. During these transitions they help in building the solutions. They lay the pheromone as they move around.
2. Pheromone Update: This involves updating/ reinforcing amount of pheromone on a pheromone trail. Sometimes the amount of pheromone may also be reduced. This process is known as pheromone evaporation. Evaporation of the pheromone trials helps ants to forget bad or inefficient solutions that were learned early in the algorithm run. This may involve updating the pheromone trails once complete solutions have been built
3. Daemon Actions: is a step which may involve applying some updates from a global source. This may include applying additional pheromone reinforcement to the best solution generated.

### III. Recent Studies on Ant Colony Optimization

A bio inspired heuristic method for load balancing is proposed in Kiran and Reddy [2]. Bio inspired methods follow real life organisms to solve computational problems. The algorithm they propose is known as load balanced termite (LB Termite), which derives the features of the insect termite. The LB Termite builds reliable paths using stability of links. The LB- Termites is also able to solve the stagnation problem using pheromone as a heuristic. The simple ant routing algorithm is proposed by Correia and Vazao [3]. Here, controlled neighbour broadcast is introduced, where only one of the neighbor broadcasts a message further, unlike normal broadcast. This reduces the routing overheads. Also, if a path is broken, then entire path is not established again, but instead only a path between broken ends is established again. The controlled neighbor broadcast is applied only when it is not able to succeed. But a question that needs to be looked into is the quality of path established, after it is broken. An ant colony–based multipath routing protocol is proposed in Misra et al [4]. The said method incorporates power consumption expended by different nodes, for making routing decisions. It builds multiple paths, which results in division of energy load among all nodes of the network, which prolongs the battery life. This results in lower per node energy consumption and lesser packet loss. Trust evaluation is an important determinant in evaluating efficiency of ad hoc sensor networks. The trust evaluation process involves overhead, and trust derivation dominates major chunk of this overhead.

IV. Bee Colony Optimization Methods

Based on the behavior of the bees in nature, various swarm intelligence algorithms are available. Artificial Bee Colony is the main method which simulates the behavior of a honeybee. The Artificial Bee Colony (ABC) is a swarm based meta-heuristic algorithm, first introduced by Karaboga [5] in 2005. A colony of bees contains three types of bees: employed bees, onlookers and scouts.

- A bee which makes the selection of a food source, when it arrives, is called as onlooker.
- The bee which visits the food sources, to collect the food is known as employed bee.
- While the scout bee is responsible for carrying out random search to discover new food sources. The employed bee whose food source has been exhausted becomes a scout bee.

The position of a food source represents a possible solution to the optimization problem and the nectar amount of a food source corresponds to the quality of the associated solution. In ABC, virtual bees are generated and which move around randomly in search of food in a two-dimensional search space. When the bees find some nectar, these bees interact among themselves. The intensity of these bee interactions is used to determine the quality of food source.
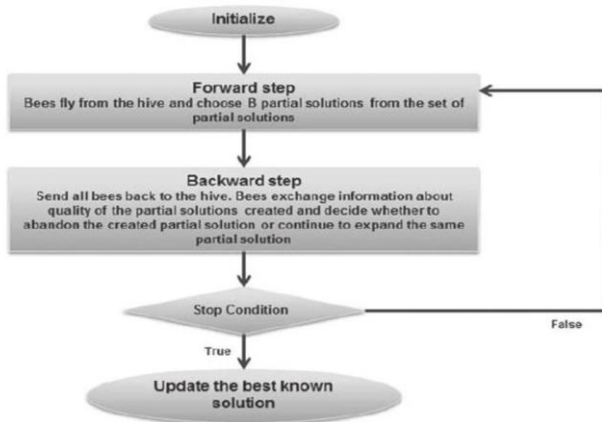
Fig 2: Flowchart representing the ABC optimization

V. Conclusion

Bio inspired methods are the methods which are inspired by principles of biology and give efficient solutions to many problems. Swarm Intelligence is an emerging paradigm in bio inspired. Swarm Intelligence is based on generalizations drawn from the behavior of different organisms. Ant Colony Optimization is among the most successful swarm based algorithms which captures the behavior of natural ants. Artificial Bee Colony is the main method which simulates the behavior of a honeybee. The Artificial Bee Colony (ABC) is a swarm based meta-heuristic algorithm. Both these methods are used to solve many optimization and computational problems very efficiently.

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Industrial Internet of Things: A Boom

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Abstract: *With the advent of Industrial Internet of Things (IIoT), there lies a huge scope for advancement in the implementation of IIoT. Various IoT implementations that cater to the large industrial sector of manufacturing are digital factory, facility management, flow management, operation management, industrial plant safety and quality control. The technology stack for the IIoT is ready to drive the manufacturing units more efficiently and optimally.*

Keywords: IoT, Industrial IoT, Implementation and its application areas

I. Introduction

For many reasons Industrial Internet of Things (IIoT) is the new way out for optimizing the automated manufacturing unit. A recent report suggests that 70 billion dollars is expected to be invested in the IIoT [1]-[5]. Focussing on the data based automated decision making, IoT has found its implementation in the 60% of the global industrial unit. By the virtue of the IoT the industrial unit may have smart and optimized managerial procedure to cater to large distributed environment. Figure 1 depicts the bar graph comparison for the investment in IIoT in the year 2015 vs 2020.

The advent of IIoT is in adjunct to other IT advancements like establishment of smart sensors, embedded systems, small robotic processes leading to big data generation and big data analytics.

II. Related Work

With the introduction of Low Pan based Wide Area Network [3], the industrial ways of doing things have revolutionized. One of the major factors that accelerate the growth of the industry is timely updates and reporting. This is now possible only with smart sensors deployed for continuous assessment of the entire manufacturing unit for intra and inter unit operations. Another related survey [4] took place where over 100 proposed IoT based smart solutions were categorized and compared with other solutions. In the past the Industrial revolution 4.0 is described as a framework to meet industrial challenges of the new century. The integration of IoT with other state of the art technologies [5] like Cyber Physical Systems (CPS), information and communications technology (ICT), Enterprise Architecture (EA), and Enterprise Integration (EI) outlines the critical challenges faced by these industrial interoperability. [6]-[8] highlights the connectivity technologies vastly fragmented ecosystem of connectivity solutions and platforms. Finally, IIoT connectivity challenges are illustrated by the example of future building automation.

III. The booming Industry with IIoT

There are specific sectors where IIoT is finding its implementation.
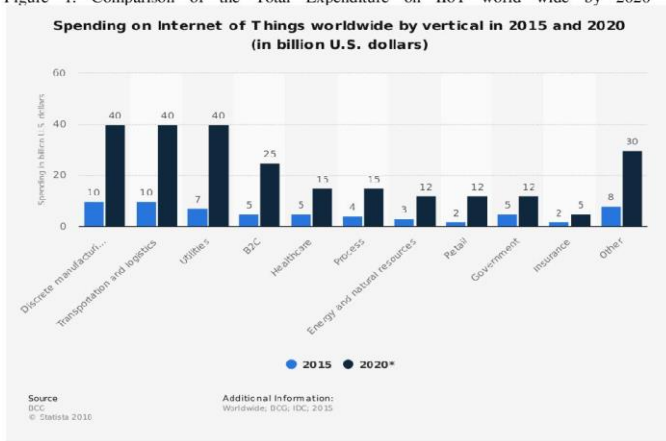
A. IIoT for Digital Factory.
In the past most of the manufacturing unit having assembly lines does reply on manufacturing parts and units from other manufacturing units. In general to have an assembly line for a final product, the availability of the sub parts is important and is time bound. In a manual process the delay is more. Whereas in the digital Factory the entire process is timely and works in advance by letting the other sub part manufacturers know which particular part is required and its quantity. By optimizing the automated process the manufacturing unit can work more efficiently.

B. IIoT for Facility Management

Sensors may now be established for the implementation of the proper environment machines. Some of the listed sensors like Temperature Sensors, IR Sensors, UV Sensors, Touch Sensor, Proximity Sensor, Transponders, Electromagnetic Identification of Manufactured Components, Surface Acoustic Waves etc. The overall efficiency of the manufacturing unit may be improved by installing various sensors. The manufacturing units are now monitored continuously and thoroughly in IIoT.

Figure 1. Comparison of the Total Expenditure on IIoT world wide by 2020

Spending on Internet of Things worldwide by vertical in 2015 and 2020 (in billion U.S. dollars)

Source
BCC
© Statista 2016

Additional Information:
Worldwide; BCG; IDC; 2015

C. IIoT for Production flow monitoring

By identifying various implementation areas where IoT may be applied for manufacturing processes. Such implementation may eliminate or make human intervention completely

redundant. The real time monitoring is now possible with IIoT. This will enhance and enable the monitoring the entire production process from start to finish.

D. IIoT for Inventory management

IIoT enables monitoring of the entire supply chain. This is applicable for distant as well as distributed environment as well. The entire inventory may be tracked and ordered without breaking in the manufacturing process. The delay is minimal as the process of the inventory available, in process and needed is clearly visible at one place.

E. IIoT for Plant Safety and Security

With Big Data analytics being the driving force for the IoT, many important insights are now possible. The key performance indicators of the various factors like health, diseases, illness, regularity, plant damage, and break-in may now be addressed well. Various indicators may be placed in and around the manufacturing unit to measure and draw useful insights for the safety and health guidelines for the factory workers.

F. IIoT for Quality Control

Sensors like temperature, gyroscope, and accelerometer along with other smart devices may enhance the overall quality of the perishable items. This is very much needed at the time of transporting these perishable items to and fro from the warehouse in raw stage to semi-processed or fully processed stage. The quality of the product may be checked while delivering these products to the end customer. These logistics collected may improve upon the quality of the end product.

G. IIoT for Packaging Optimization

IIoT sensors may be placed while packaging or handling the end product. This will enable the smart tracking of the product. This will further provide the manufacturer with the useful insights like effect of transportation, weather and handling of the product. This will further enhance the customer experience. This may further reduce the additional cost of implied on packaging that is otherwise not needed.

F. IIoT for Logistics and Supply Chain Optimization

IIoT may enable the aspect of continuous reporting of the local and global manufacturing unit. All sort of data generated may further be feed in to the system to learn about the interdependencies, flow of stock and production time.

IV. Conclusion

Industrial Internet of Things is backed with the technology stack of small sensors, machine learning tools, artificial intelligence leading to big data has potential to optimize the industrial work flow in absence of human invention. In the coming years the artificial intelligence along with machine learning will lead to changed working environment. There is so much to expect from IIoT. But only the time has all the answers.

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Machine Learning: Study of Algorithms

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Abstract: *In today's digital world, a user is overwhelmed with large amount of information, which creates the situation of dilemma for the user. The user is not able to analyze and examine the patterns from the data quickly and efficiently. This demands the study of machine learning algorithms that are able to analyze the data quickly and ease the decision making process of users. Moreover, it also benefits the industries too as the implementation of such algorithms retain the customers due to the availability of fast data processing. This paper mainly discusses the importance, algorithms and application areas of machine learning that would benefit the users and service providers too.*

Keywords: *Machine Learning; Data Science; Artificial Intelligence; Data Analysis; Information Overload*

I. Introduction

In today's digital world, the advancement in technology makes it difficult for the users to predict the future, analyse the patterns and take the right decision in short span of time. This demands the need of efficient machine learning algorithms that may help in forecast of future, correct classification of the patterns so that user can take right decision within stipulated time-frame. Machine Learning is basically making the computers intelligent; researchers are trying hard to train the machines but still it is the most challenging task that needs to be worked upon to maximize the benefits for users and industries. This study would help the researchers in this field and would familiarize with its basics, algorithms, and application areas.

Machine Learning is the subfield of artificial intelligence that mainly focuses on analysis of patterns and structures in the data to accredit the learning mode without human interactions [1]. It permits the users to feed the large amount of data; analysis of data is accomplished that improvises the decision-making. In any business, data is the most crucial element that even drives the competition among industries too. Machine Learning is the key to this lock that keeps the company ahead as it assists in fast decision making and increases the value of data too. The major steps of machine learning process are shown in figure 1 below.
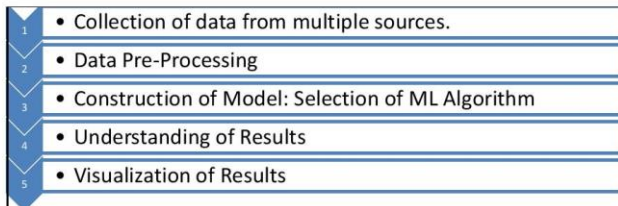
1. • Collection of data from multiple sources.
2. • Data Pre-Processing
3. • Construction of Model: Selection of ML Algorithm
4. • Understanding of Results
5. • Visualization of Results

Figure 1 Steps of Machine Learning Process

a) Collection of data from multiple sources: Data is the most important and crucial research element. So, the first step is the collection of data from the reliable source on which the experiments are to be carried out.

b) Data Pre-Processing: After the collection of data, the data needs to be pre-processed so that there is homogeneity in data which is collected from multiple data sources. As heterogeneous data that is data in different data formats would cause inconsistency.

c) Construction of Model: After the pre-processing of data, the model is build using suitable machine learning algorithm. The selection of machine learning algorithm should be done cautiously otherwise it could lead to insignificant interpretation. The choice of algorithms depends on various factors such as type of data; problem to be solved, and design constraints.

d) Understanding of Results: The interpretation of results is the most important task as the results from the analysis would contribute to the literature and help the academicians to gain insights about a particular research study.

e) Visualization of Results: The transformation of results into graphical form is an added benefit as it saves the time and makes the analysis easier to understand. The various tools and library in programming languages [10, 11] are available to ease the process such as R, Python, Weka, and many more.

The remaining paper is outlined as follows: the approaches are described in section 2, application areas are discussed in section 3, and its comparison is given with Artificial Intelligence.

II. Machine Learning Algorithms

Nowadays, machine learning is applied in almost every field. It is broadly categorised into three types [1] as shown in figure 2 below:
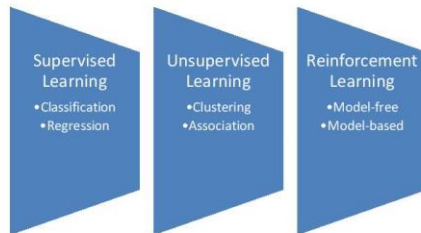
Figure 2 Types of Machine Learning Algorithms

a) Supervised Learning: In this type of learning [1], correct responses are available beforehand. The new data is fed to the system and system's performance is measured according to predicted correct responses.. This type of learning is known as supervised learning as teacher is available throughout the process to correct the responses. The learning of an algorithm stops when it reaches the level of acceptable performance.

The classification and regression problems comes under the category of supervised learning algorithms.

- **Classification**: In this problem, the output is of a category type such as "A", "B" or "C".
- **Regression**: In this problem, the output type is a real value such as height, weight etc.

b) Unsupervised Learning: In this type of learning, correct responses are not available beforehand. The new data is fed to the system and the motive is to analyze the patterns in the data. This type of learning is known as unsupervised learning [9] as teacher is not available to correct the responses.

The clustering and association problems comes under the category of unsupervised learning algorithms.

- **Clustering**: In this problem, the best group is determined in which data point can be placed like teenage age-group likes comedy movies.
- **Association**: In this problem, the rules are determined that could explain the major portion of the data like Amazon display the products which are frequently bought together.

c) Reinforcement Learning: It is a reward-based learning [8] in which machine is trained for a specific environment. The model-free and model based algorithms comes under the category of reinforcement learning algorithms.

III. Machine Learning Application Areas

In today's scenarios, machine learning is applied in various disciplines of industry. Some of the applications [3-7] are listed below:

- *Optimization of Search Results*: Google itself uses machine learning algorithms to give most relevant results. The multi-layer neural networks are used to train the network and corrections are provided iteratively to improve the performance of the network.
- *Natural Language Processing:* Machine Learning is used in natural language processing as machine learns based on the past data fed as an input.
- *Pattern Recognition:* Machine Learning is used to recognize the patterns in the data like in treatment of cancer patients.
- *Healthcare*
- *Travel and Hospitality*
- *Recommendation Systems*
- *Intrusion Detection Systems*
- *Image Processing*
- *Sentiment Classification*
- *Traffic Light Classification*
- *Text Categorisation*
- *and many more..*

IV. Comparison of Machine Learning with Artificial Intelligence

This section basically defines and demarcates the two major terms "Artificial Intelligence" and "Machine Learning" which is a little bit confusing [12]. Artificial Intelligence is the branch of computer science that mainly deals with the training of computers so that computers can perform better without human intervention. It always tries to determine the optimal solution.

On the other side, machine learning is the sub-field of artificial intelligence that tries to learn on its own without explicitly programming it. It basically learns from past data and experience. It always tries to find out the solution not necessarily an optimal solution. The main motive of machine learning is to improve the performance of the system into consideration whereas motive of artificial intelligence is to make it a success.

V.   Conclusion

Machine Learning is the field that automates the machines by acquisition of knowledge and learns from the past behavior without explicitly programmed from the humans. In this research article, the basics of machine learning has been emphasized, categories of machine learning algorithms are discussed along with the problems that falls into this category. Thereafter, the application areas are discussed that ponders over the areas where the machine learning is applied. Moreover, comparison of two confusing terms "Artificial Intelligence" and "Machine Learning" is also made clear so that no misleading concepts remain among the academicians regarding these terms. This article can be further extended to provide more insights into the algorithmic details used in this domain.

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E-paper technologies – A Review Article

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Abstract: *Electronic paper make the revolutionary change to by introducing the new display technique and providing paper like readability. Made of a flexible material, consuming low power, low cost to manufacture and providing paper like readability, e-papers in future will hold libraries on a chip and replace most printed documents before the end of the next decade. This article discusses the history, structure and display technology of the electronic paper.*

Keywords: *Electronic Paper; e-Paper; electrocapillarity ; electrophoretic-based e-ink.*

I. Introduction

E-paper is electronically addressable paper-like display that uses real paper substrates. This effort includes the development of novel electronically addressable contrast media, microencapsulation chemistry and desktop printing technologies to print functional circuits, logic, and display elements on paper-like substrates, including interconnecting vies and multi-layer logic. E-paper overcomes one of the disadvantages of the printed page i.e immutability once typeset [2]. E-paper also called radio paper, smart paper or just electronic paper, is a reusable, portable storage and display media that is paper-like but can be dynamically updated, repeatedly written on (refreshed) - by electronic means – n number of times [4]. E-paper has Low power consumption, Reflective display, Same readability as print, Same LCD monitor resolution and thin and flexible displays preferably bendable, or have roll-able display technology[5][6]. E-paper can be used for indoor and outdoor displays. E-paper is used in applications such as e-books, electronic newspapers, portable signs, foldable & roll-able displays [4]. It is cost effective solution for traffic signs, retail shelf labels, interactive museum signs, notice boards and passenger information boards [7]. Nicholas K. Sheridon invented the Gyricon rotating-ball display based on a physical phenomenon which he called "electrocapillarity." The electrocapillarity display worked by moving colored liquids against a white background [15]. This paper presents an overview of the structure of e-paper and different display techniques used for e-paper.

Figure 1: Capsules filled with negatively and positively charged particles color the surface of an EPD when an electric charge is applied [9]
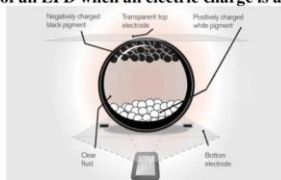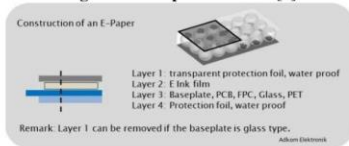
II. Structure of the E-Paper Display technology

The E INK contains pellet of +ve and -ve charged white and black flakes. The pellet is embedded in light oil. The flakes can be drawn either to the front or back of the layer to make the required content visible by applying the voltage [1].

The e-paper comprises of three layers, first layer is transparent, waterproof protective foil and second layer is actual E INK film. The third layer encompasses the base substrate which is composed of either FPC, PCB, PET or glass. The fourth layer is a waterproofed protection foil, final cover of the construction [1][8].

Figure 2: E-Paper Structure [1]

Construction of an E-Paper

Layer 1: transparent protection foil, water proof
Layer 2: E Ink film
Layer 3: Baseplate, PCB, FPC, Glass, PET
Layer 4: Protection foil, water proof

Remark: Layer 1 can be removed if the baseplate is glass type.

Adkom Elektronik

III. Display techniques used for E-Paper

Electronic ink is a pioneering creation that has all the required features of a modern electronic display and the complete suitability and physical flexibility of sheet of paper. E-paper is also called electronic paper, smart paper or radio paper. The effort is to create a dynamic high-resolution display that's flexible enough to become the next generation of paper.

The E-paper technology visualized electronic books that can hold libraries of information, newspapers that are updated daily via wireless broadcast. Without backlighting, they provide the readability of paper under virtually any condition. And E Ink displays are persistent without power, drawing current only when they change, requiring low powered batteries.

a) Gyricon

Nick Sheridon at Xerox's Palo Alto Research Center developed the first E-Paper was called Gyricon in 1970s. It consisted of polyethylene pellet between 75 and 106 micro-meters across. Each pellet is a Janus particle composed of -ve charged black plastic on one side and +ve charged white plastic on the other [14].

b) Electrophoretic

An electrophoretic display creates visible images by reorganizing charged pigments using an applied electric field.

IV. Figure 3(a): Scheme of an electrophoretic display	V. Figure 3(b): Pixel Appearance of an electrophoretic display
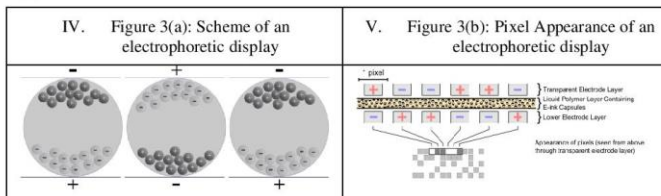
In electrophoretic display, particles approximately one micrometer in diameter of titanium dioxide, a dark-colored dye, surfactants and charging agents are dispersed in a hydrocarbon oil placed between two parallel, conductive plates. When a voltage is applied from one side to the other of the two plates, the particles migrate electrophoretically to the plate bearing the opposite charge from that on the particles. Electrophoretic displays can be manufactured using the Electronics on Plastic by Laser Release (EPLaR) to create flexible plastic displays.

Figure 4: Basic Scheme of an Electrophoretic Display using Color filters [10]
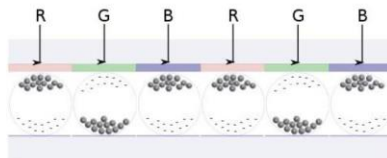
The low power consumption and print-like readability are the prominent features of electrophoretic display technology. This technology is used for the development of bendable displays and other innovative consumer electronic applications such as a tablet computer that can be rolled or folded, a smartphone with curved screens [5].

c) Electrowetting

Electrowetting is a type of e-ink display technology. It supports full-color video playback. It is based on controlling the shape of a kerbed water/oil interface by an applied voltage. [15].

d) Electrofluidic

Electrofluidic display is a variant of an electrowetting display. Electrofluidic displays consists of polymer layer aqueous pigment dispersion filled in very small cavity. The concept is based on electrowetting technology but in device principles and performance. The mechanism of movement of liquids through microfluidic cavities as a result of an applied charge is termed as electrofluidic [15].

VI.   Applications of E-paper and Its Present-Day Technology Status

Amazon's Kindle is the most popular brand that uses e-paper technology. Companies such as E Ink, SiPix, Sony, IBM, Fujitsu, Epson and many others are into developing e-paper technology. Based on research begun at the Massachusetts Institute of Technology's Media Lab, E Ink developed proprietary e-paper technology that already have been commercialized by a number of companies having e-paper readers on the market.

VII.   Conclusion

Electronic paper using E Ink will have impact on the publishing industry. Use of this technique may not be diminish the traditional displays but will exist with other display technologies.

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A review on Testing Tool

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Abstract: Errors in a software product are difficult to find and fix. The finding and removal of such errors from the software is done through testing process. Testing of a software product is done with an intention of finding more and more bugs in the software. But if such bugs still remain in the software then it can lead to the failure of the software at some point of time. In recent years, there are many tools which have been developed for detecting the bugs in the source code automatically by analyzing it. Different testing tools have different features.
This paper discusses different testing tools for java. This paper presents a comparative analysis of the features provided by three such popularly used tools namely, Junit, Jtest & Jwalk in the current scenario. This paper presents the bug reports and warnings produced by different tools. This paper also describes the cost and performance of each tool. Finally, this paper suggests that which tool should be used in the different conditions.

Keywords: WWW; Unit testing, open source, Junit, Jtest, Jwalk, ArbitCheck

I. Introduction

Unit testing is a way to maintain the bugs in check. It is applicable on the single pieces of code i.e functions or methods and continues testing these smaller pieces of code until the whole software is tested. In Unit testing programmer who write the code can do testing himself. Testing smokes out the bugs, but programmers are generally loath to devote time to anything but coding. In unit testing, we exercise some code—providing input, if needed, and examining the code's behaviour, usually in the form of its output. The simplest way to do the unit testing is to write number of If statements to make comparison with the expected value to find the bugs in the code.

A test usually needs some scaffolding—a way to initialize variables and create objects, for example. In JUnit, preparation is called *setup*. It's independent of the assertions, so the same scaffolding can apply to several individual tests. The setup is run before each test [1]

II Different Testing Tool

A JUnit CONCEPTS

JUnit is an open source Java library that purports to make unit testing fun—so much fun, in fact, that programmers will love writing tests[1]. Kent Beck and Erich Gamma created JUnit, which is derived from Beck's Smalltalk testing framework. In this the main purpose is to test and code simultaneously. The programmer who write code also write test code for the same.. The result of test is fail, then they do the debugging. If test's result is pass then they continue to write another code and tests, and so on. All programmer maintain the code and its corresponding tests. If any change in code then its become easier to do retesting again by the corresponding tests.to make sure that the software didn't break by the changes in the code.

In JUnit, instead of numbers of If statements for testing, we can use *assertions*. An assertion is another way of defining the expected result and comparing it with the actual result. If the expected and actual results are same then the assertion passed otherwise it is failed. After the completion of test some cleanup actions are required. In JUnit this is called *teardown*. This is to confirm that the test ends up with a clean slate. After this the next test is to make sure that the setup will run correctly. These two are called a test's *fixture*. Individual tests are called *test cases* These test cases are related to each other. If we go for complete deep unit testing, it will require a large test case collection. Many times the programmers execute some of these test cases together. When this occurs, they can combine the cases into *test suites* that run as a single group. All tests are kept with the code, so if the working code changes, it's easy to perform regression tests to ensure that the changes didn't break the software.

The success of JUnit becomes inspiration for many extensions that provide the testing of specific code. These extensions target database code, Enterprise JavaBeans, and servlets. JUnit has a very simple library that make ti easy to write the code again from scratch.

B Jtest CONCEPTS

Jtest is an automated Java testing and coding standard analysis product that is made by Parasoft. It aims to improve Java code reliability, functionality, security, performance, and maintainability. Basic functionality includes Unit test-case generation, static analysis, regression testing, and code review. Jtest is used by companies such as Cisco Systems, TransCore, and AIG United Guaranty. Jtest provides with the following features.

- **Static code analysis**
  Facilitates regulatory compliance (FDA, PCI, etc.). Ensures that the code meets uniform expectations around security, reliability, performance, and maintainability. Eliminates entire classes of programming errors by establishing preventive coding conventions.

- **Data flow static analysis**
  Detects complex runtime errors related to resource leaks, exceptions, SQL injections, and other security vulnerabilities without requiring test cases or application execution.

- **Metrics analysis**
  Identifies complex code, which is historically more error-prone and difficult to maintain.

- **Peer code review process automation**
  Automates and manages the peer code review workflow- including preparation, notification, and tracking- and reduces overhead by enabling remote code review on the desktop.

- **Unit test generation and execution**
  Enables the team to start verifying reliability and functionality before the complete system is ready, reducing the length and cost of downstream processes such as debugging.

- **Test case "tracing"**
  Generates unit test cases that capture actual code behavior as an application is exercised providing a fast and easy way to create the realistic test cases required for functional/regression testing.

- **Automated regression testing**
  Generates and executes regression test cases to detect if incremental code changes break existing functionality or impact application behavior.

- **Coverage analysis**

  Assesses test suite efficacy and completeness using a multi-metric test coverage analyzer. This helps demonstrate compliance with test and validation requirements such as FDA.

- **Team deployment and workflow**

  Establishes a sustainable process that ensures software verification tasks are ingrained into the team's existing workflow and automated so team members can focus on tasks that truly require human intelligence.

- **Error assignment and distribution**

  Facilitates error review and correction. Each issue detected is prioritized, assigned to the developer who wrote the related code, and distributed to his or her IDE with direct links to the problematic code.

- **Centralized reporting**

  Ensures real-time visibility into quality status and processes. This helps managers assess and document trends, as well as determine if additional actions are needed for regulatory compliance.

C JWalk CONCEPTS

JWalk is a *lazy systematic unit testing* tool [2]. The lazy systematic testing method is based on *lazy specification*, inferring a continuously changing specification from rapidly evolving code, by dynamic code analysis and programmer interaction, and *systematic testing*, generating complete test-sets that exercise and validate the state-space of the class-undertest (CUT) exhaustively to bounded depths [3].

The *JWalk* tool allows the human tester first to validate the CUT's specification by exploration, then to compile a test oracle interactively, confirming key properties of the CUT. These are re-used predictively during automated testing, which verifies the states and transitions of the CUT exhaustively.

D JWalk challenges JUnit

A challenge was set up to contrast the effectiveness of semi-automated testing with *JWalk* against expert manual testing using *JUnit* [4], the most widely used testing tool in the agile community. The first part was to compare the coverage of expert manual test-case selection against *JWalk*'s proposed tests. The second part was to demonstrate the improved coverage of *JWalk*'s regenerated tests over regression testing.

Two related pairs of CUTs were tested, including a simple LinkedStack, later modified as a BoundedStack (a code evolution); and a LibraryBook, later extended as a ReservableBook (by inheritance). The competing testers were asked to develop "complete tests" for each initial class. Later, JWalk was allowed to propose further tests for the modified or extended versions.

E Apache JMeter

The Apache Software Foundation developed the Java desktop application to load the functional behaviour of test and then calculate its performance. Initially it is developed for testing the web applications and now it is expanded to other test functions. Now it can be used for performance testing both on static and dynamic resources (files, Servlets, Java Objects, Data Bases and Queries, FTP Servers and more). It can be used to see the load on a

server, network or object to do performance test under different types of load. It provide graphical analysis of performance test on server.

It is a pure Java desktop application developed to do load testing to check functional behavior and measure performance. Primarily It is used for testing Web Applications but later it is expanded to other functions of testing. It can be used for performance test on both on static and dynamic JMeter is also used to show a heavy load on a server, network or object to test its strength or to analyze overall performance under different load types.

Apache JMeter features include:

- Can load and performance test HTTP and FTP servers as well as arbitrary database queries (via JDBC)
- Complete portability and **100% Java purity** .
- Full **Swing** and lightweight component support (precompiled JAR usespackages javax.swing.*).
- Careful **GUI** design allows faster operation and more precise timings. Caching and offline analysis/replaying of test results.
- **Highly Extensible:** Pluggable Samplers allow unlimited testing capabilities.Several load statistics may be choosen with **pluggable timers** .
- Data analysis and **visualization plugins** allow great extendibility as well as personalization.

Functions (which include JavaScript) can be used to provide dynamic input to a test Scriptable Samplers (BeanShell is supported in version 1.9.2 and above)

F The Grinder [FREE - Open Source]

The Grinder is a Java™ load-testing framework. It is freely available under a BSD-style open-source license. The Grinder is a Java load-testing framework making it easy to orchestrate the activities of a test script in many processes across many machines, using a graphical console application. The Grinder is a JavaTM load-testing framework. It is freely available under a BSD-style open-source license. The Grinder makes it easy to orchestrate the activities of a test script in many processes across many machines, using a graphical console application. Test scripts make use of client code embodied in Java *plug-ins*. Most users of The Grinder do not write plug-ins themselves, instead they use one of the supplied plug-ins. The Grinder comes with a mature plug-in for testing HTTP services, as well as a tool which allows HTTP scripts to be automatically recorded.

The Grinder was originally developed for the book *Professional Java 2 Enterprise Edition with BEA WebLogic Server* by Paco Gómez and Peter Zadrozny. Philip Aston took ownership of the code and reworked it to create **The Grinder 2**. Philip continues to enhance and maintain The Grinder, and welcomes all contributions. Recently Peter, Philip and Ted Osborne have published the book J2EE Performance Testing which makes extensive use of The Grinder.

The next major version of The Grinder, The Grinder 3 is currently available as a beta quality release. The Grinder 3 uses the powerful scripting language Jython, and allows any Java code to be tested without the need to write a plug-in.

G HOMAJ

A Tool for Higher Order Mutation Testing in AspectJ and Java. HOMAJ automates the process of generating and evaluating first order mutants (FOMs) and higher order mutants (HOMs). In particular, HOMAJ can be used to generate subtle HOMs, which are HOMs that cannot be killed by an existing test set that kills all the FOMs. Subtle HOMs can be valuable for improving test effectiveness because they can simulate complex and non-trivial faults that cannot be simulated with the use of traditional FOMs.

HOMAJ implements a number of different techniques for generating subtle HOMs, including several search-based software engineering techniques, enumeration search, and random search. HOMAJ is designed in a modular way to make it easy to incorporate a new search strategy.

H ArbitCheck: A Highly Automated Property-based Testing Tool for Java

Lightweight property-based testing tools are becoming popular these days. With property-based testing, developers can test properties of the system under test against large varieties of randomly generated inputs without writing test cases. Despite the advantages of property-based testing, current property- based testing tools have a major drawback: they require developers to write generator functions for user-defined types. This is because it is difficult for a tool to infer the possible values for the type. However, user-defined generators sometimes fail to find faults by only producing overly limited varieties of values. In this paper, we present a new property-based testing tool, called ArbitCheck, which automates object generation by adapting the feedback-directed random test generation technique. With the help of feedback-directed random test generation, ArbitCheck exhaustively generates possible values of user-defined types and tests properties with them, so that it can reveal faults that are hard to find with either manually written tests or existing property-based testing tools

A property-based testing tool for programs written in Java language. It can test properties written in Java language without user-defined object generators. The key idea is to use feedback-directed random test generation algorithm for creating random inputs to property-based tests.The user compiles the code into a class file, and runs Ar- bitCheck with the class. ArbitCheck scans the class to find properties annotated with @Check, and then runs feedback- directed random test generation. The test generation ends when each property is tested against n different inputs, where n is a configurable integer number (defaults to 1000). After running property-based tests, ArbitCheck reports the result. If the property throws an exception, ArbitCheck regards it as an indication that the property failed to hold. In this manner, developers can use any assertion utility library, including JUnit, to describe properties. The exception can be either checked or unchecked, and the throws clause of properties does not affect any behavior of ArbitCheck

I Bacterio: Java Mutation Testing Tool

Bacterio is a Java mutation testing tool that automates the tasks to perform mutation analyses and that implements a set of mutation techniques that reduce the costs of mutation and the execution mutant time drastically. Thus, this tool helps testers to evaluate the quality of their tests, keeping mutation cheap and fast.

Bacterio is a standalone GUI based application written in Java. It is designed to perform mutation analysis of Java applications and supports test cases written in two kinds of test

frameworks: JUnit and UISpec4J. The architecture of Bacterio is based in three modules, as Figure 2 shown above.

Bacterio, is a mutation testing tool that automatizes the three tasks to perform a mutation analysis. The main contributions of Bacterio are two: 1) it implements almost all the techniques to reduce costs of mutation testing. It allow testers to use all the techniques together making feasible to perform a mutation analysis for big, industrial systems; and 2) it implements Flexible Weak Mutation [2], that allows testers not only to perform mutation analysis at unit level, but also at system and multiclass levels. This is an important contribution to the field since with this tool it is possible to check the quality of the tests cases from a system point of view, where errors that cannot be checked at unit level appear.

III Conclusion

Bacterio is a mutation testing tool that supports mutation analysis for java applications. This kind of analysis describes the quality of the test cases of the system under test through the mutation score, which is a very valuable measure to select tests and to identify the need to design new test cases. As a novelty, Bacterio is the first mutation testing tool that implements Flexible weak mutation and can perform mutation analysis at system level. Also, Bacterio is the first tool that includes so many mutation techniques, making possible to perform mutation analysis with reasonable cost and time.

ArbitCheck, a property-based testing tool for Java. ArbitCheck takes properties written in Java and tests them with feedback-directed random test generation. Additionally, it produces JUnit test cases for developers to inspect failed properties with concrete sequences of methodcalls that lead to errors.

HOMAJ, a higher order mutation testing tool for AspectJ and Java programs. HOMAJ automates the processes of generating FOMs and HOMs, compiling and executing them against test suites, classifying HOMs, and analysing results. HOMAJ implements various techniques for finding subtle HOMs, which can be used to improve fault detection effectiveness of test suites.

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Emotion Recognition from Speech: A Review

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Abstract: *To express our ideas, thoughts and plans we use one of the modes of communication. It can be either verbal or non-verbal. Speech, used for verbal communication, is a complex signal which contains information about speaker, message, language, emotions and so on . Recognition of emotions by machine is still a challenging issue, especially when we have to recognize the emotions of the speaker which are attached with speech, to understand the actual meaning of the speech. Emotional speech interaction with machine will provide more natural interaction between the human and computer . Emotion identification from speech may also be very helpful for forensic purpose like criminal investigation, intelligent assistance, detection of potentially hazardous events etc. It is also helpful in health care and others. Emotion analysis of telephone conversation would help crime investigation department in the investigation process*

Keywords: *Speech processing, Emotions, MFCC, Speech Features, filterbank.*

I. Introduction

The human speech consist of two channels; explicit channel, which carries linguistic contents of the conversation and implicit channel, which carries the paralinguistic information about speaker. The paralinguistic properties are emotions, age, stress, voice quality, pathological state etc [1]. There are a number of spectral and temporal features that can be extracted from human speech and these features can be classified into two categories:

i. Prosodic Parameter: Innotation is referred to as prosodic features. Innotation describe variation in pitch, loudness, tempo and rhythm. These parameters are different for different speaker in different emotions. But these parameters are also affected by other factors like size of speech corpus, speaker and the language [2][3]

ii. Voice quality parameter: Jitter, Shimmer, aspiration noise, open quotient, speed quotient and return quotient comes under this category. The shimmer and jitter give the sensation of harsh voice while aspiration noise creates the breathy effect. So these parameters have been used to generate speech with emotion [4][9]

The most common three-dimensional model includes Valence, Activation and Potency. This additional primitive describes the degree of control that the individual intends to take on the situation, or in other words, how strong or weak the individual seems to be [5]. Schlosberg proposed a three-dimensional emotion space consisting of activation (arousal), potency (power) and valance (pleasure). Ekman defined seven basic emotions the humans are well familiar with happiness, sadness, anger, anxiety, boredom, disgust and neutral. According to him more emotions can be defined by mixtures of basic emotions. Discrete emotions and continuous emotion dimensions can be combined to locate discrete emotions in a continuous emotion space. Figure 1 shows the locations of six basic emotions in the three dimensional space [18]. Emotion recognition rates depend on the number and kind of emotions, and the type of emotion like elicited acted and natural. Especially, in a speaker-independent system, have issues that lead to decreases in recognition rates, as emotional features vary from person to person[1].
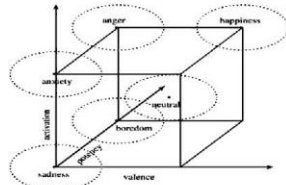
Figure 1. Locations of six basic emotions in the three dimensional emotions space.

II. Challenges in Speech Emotion Recognition

The task of Speech emotion recognition is very challenging because of the following reasons, First, Expression of emotion depend upon speaker, environment and his/her culture. Another problem is that one may undergo a certain emotional state such as sadness for a long time. In such a case, other emotions will be transient and will not last for more than a few minutes. As a consequence, it is not clear which emotion the automatic emotion recognizer will detect: the long-term emotion or the transient one. Other issues are it is not clear which speech features are most effective to distinguish the emotions, as some researchers use some specific feature while some other used combination of more than one feature to recognize the emotion from speech. Along with features, suitable models are to be identified to capture emotion specific information from extracted speech features. [16]. There may be another big challenge that different persons express same emotion differently, the two people saying the same sentence may produce the different sound signals whether they are using the same language.

III. Review on Speech Corpora

In recent years a number of researches have been done to identify human emotions using speech information. Many speech databases have built for speech emotion research in different languages[10].

Speech corpora used for developing emotional speech system can be divided into 3 categories [1][3][8] :

i. Simulated (Acted) emotional speech database
ii. Induced (Elicited) emotional speech database
iii. Natural (Spontaneous) emotional speech database

Simulated emotional speech corpora can be further classified into two classes based on the type and experience of the speakers. First class is of trained speakers like theatre or radio artist and second class is of untrained speakers. In both classes the speakers are asked to express specific natural sentences in different emotions. This is one of best methods of collecting expressive speech database containing wide range of emotions [3]. Generally it is found that simulated emotions tend to be more expressive than real ones.

Induced speech corpora are collected by creating artificial emotional situation, without knowledge of the speaker. Speakers are made to involve in emotional conversation with anchor, where different contextual situations are created by anchor. These databases may be more natural compared to their simulated counterparts [3].

Natural emotions are mildly expressed. Sometimes it may be difficult to clearly recognize these emotions. They are also known as underlying emotions [3]. Naturally available real world data may be recorded from call centre conversations, a dialog between patient and a doctor, emotional conversation in public places and so on [3].

IV. Reviews on Emotion Recognition from Speech

Speech signal is an outcome of time varying vocal tract system excited by the time varying excitation source signal. Hence speech features are present in both vocal tract system and excitation source characteristics. Speech emotion research works started with spectral features in the beginning. This session gives a brief review about speech emotion recognition using spectral parameters.

The first investigation of speech emotion recognition was conducted in 1972 [1]. This study sought general qualitative acoustic correlations of emotion in speech. In the mid 1980s, studies of emotion recognition started to use statistical properties of certain acoustic features. Most emotion recognition processes work in speaker dependent system with recognition rates varying from 70% to 90%, however in speaker-independent systems, show lower recognition rates compared with speaker dependent mode [1].

K. Takahashi et al. (2003) investigated the recognition of emotions from speech using LPC features. A delta LPC parameter, which is calculated from the LPC parameters and a time variable feature of the speech spectrum, is used as features for their study. Eight emotional states joy, teasing, fear, sadness, disgust, anger, surprise and neutral are recognized in their work. Artificial neural network, Support vector machine and Hidden markov model are explored as emotion recognition methods [11].

T. L. New et al. (2003) proposed a method that makes use of short time log frequency power coefficients (LFPC) to represent the emotional speech signals and a discrete Hidden Markov Model (HMM) as the classifier. The emotions are classified into six categories such as anger, disgust, fear, joy, sadness and surprise. Short time LFPC represents the energy distribution of the signal in different Log frequency bands. Spectral analysis shows that distribution of energy is dependent on emotion type and this serves as a good indication of emotion class[12] .

T. L Pao et al. (2005) investigated Mandarin speech based emotion classification. Five emotions, including anger, boredom, happiness, neutral and sadness are investigated in their study. For speech emotion recognition, they combined 16 LPC coefficients, 12 linear prediction cepstral coefficients (LPCC) components, 16 log frequency power coefficients (LFPC) components, 16 perceptual linear prediction (PLP) coefficients, 20 MFCC components and jitter as the basic features to form the feature vector. The recognizer presented in this paper is based on three classification techniques: Linear discriminant analysis (LDA), k-nearest neighbor (K-NN) and HMMs [13].

N. Sato et. al. (2007) evaluated the effectiveness of MFCCs as the feature for speech emotion recognition. They focused on the precise classification of MFCC feature vectors rather than their dynamic nature over an utterance. To realize such an approach the proposed algorithm employs multi template emotion classification of the analysis frames. Hidden Markov Model is used as the classifier for their work [14].

Y. S. Chavhan et al. (2010) used the speech features such as, Mel Frequency cepstrum coefficients (MFCC) and Mel Energy Spectrum Dynamic Coefficients (MEDC) for speech emotion recognition. The Support Vector Machine (SVM) is used to classify five emotional states such as anger, happiness, sadness, neutral and fear, from Berlin emotional database [15].

S.G.Koolagudi et al. (2012) proposed spectral features extracted from sub syllabic regions and pitch synchronous analysis for speech emotion recognition. Linear prediction cepstral coefficients, Melfrequency cepstral coefficients and the features extracted from high amplitude regions of spectrum are used to represent emotion specific spectral information. Spectral features extracted from each pitch cycle, are also used to recognize emotions present in speech. The five emotions used in this study are: anger, fear, happy, neutral and sad .

M. Gilke et al. (2012) discusses the method to extract features from a recorded speech sample, and using those features, to detect the emotion of the subject. Mel-Frequency Cepstrum Coefficient (MFCC) method was used to extract these features. Five emotional states such as neutral, happy, sad, anger and surprise are used for classification in their study. These features result in different MFCC coefficients that are input to the trained ANN which will analyze

them with the stored database and compare the same to recognize the emotion. They have compared the feature extraction techniques with English, Hindi and Marathi languages [16].

K. S. Rao et al. (2013) used global and local prosodic features extracted from duration, pitch, and energy values for speech emotion recognition. Global prosodic features represent the gross statistics such as mean, minimum, maximum, standard deviation, and slope of the prosodic contours. Local prosodic features represent the temporal dynamics in the prosody. Global and local prosodic features are analyzed separately and in combination at different levels for the recognition of emotions. Support vector machines are used for classifying the emotions.[17]

S. S. Nidhyananthan et al. (2013) recognized five basic emotional states like angry, kind, sad, rude and surprised in their work. They used features such as energy, formants, zero crossing rate (ZCR) and Naive Bayes classifier in their study. They conclude that different results of emotion recognition can be obtained from different combination of the speech features. They recognize that by increasing the number of classification features there is gradual increment in classification efficiency also [18].

Firoz Shah, A. et al.(2014) studied Speech Emotion Recognition with the multi resolution analysis using Discrete Wavelet Transforms Parameters(DWT), Wavelet Packet Decomposition(WPD) parameters, Wavelet Packet Decomposition energy parameters and Wavelet Packet Decomposition energy entropy parameters in detail. He experimented all of the wavelet transformation techniques using Daubechies wavelets and found that Daubechies wavelet Db4 is optimum choice for transient emotional speech signal analysis. He conducts the speech emotion recognition experiments and found that the hybrid features of WPD energy entropy and prosodic features give the better results. He state that recognition efficiency of the classifiers are different with the feature sets used and experimented by using the hybrid feature set and RF classifier [1].

v. Reviews on Emotional State Classification Models

For emotional state modelling, a variety of pattern recognition methods are utilized to construct a classifier, such as Gaussian Mixture Models (GMMs), Hidden Markov Models (HMMs), Support Vector Machines (SVMs), Artificial Neural Networks (ANNs), Decision Trees or k-Nearest Neighbor distance classifiers (kNNs).

Among all classifiers, Gaussian Mixture Models (GMMs) have been studied the most [19][13][20]. GMMs are probabilistic models for density estimation using a convex combination of multi-variate normal densities. They are very efficient in modelling multi-modal distributions [21] and their training and testing requirements are considerably fewer than the requirements of a general continuous HMM. GMMs is used as global feature extraction, prosodic features are usually processed on a frame-level basis (suprasegmental features) from emotional speech. Similar to many other classifiers, the definition of the optimum number of Gaussian components is a difficult task that cannot be addressed uniformly in the literature.

Hidden Markov Models (HMMs) are considered to be a common classification technique for speech emotion recognition [13]. Usually, each emotion is modelled by a single state Hidden Markov Model (HMM) that is trained by maximizing the minimum separation margin between emotions, while the margin is scaled by a loss function [9][13]. HMMs are stochastic processes which consist of a first-order Markov chain whose states are hidden from the observer. Since the association with each state is a random process that generates the observation sequence, the hidden states of the model capture the temporal structure of the data. A critical design issue of an HMM classifier is the determination of the optimal number of states, the type of the observations and the optimal number of observation symbols (for discrete HMM) or the optimum number of Gaussian components (for continuous HMM). As in the above studies, HMMs have been used in stress state recognition [9][12].

Support Vector Machines (SVMs) have been used more recently and seem to be promising as a classification schema for emotion recognition in speech, as assessed in many papers [10][22][23][24]. SVMs offer specific advantages over GMM and HMM including the global optimality of the training algorithm and the existence of excellent data-dependent generalization bounds[15]. On the other hand, their success in non-separable cases is relatively heuristic. There is no systematic way of choosing the kernel functions and as a result, the separation of the transformed features is not always guaranteed. In fact, in the problem of emotion recognition from speech, perfect separation of the training data is not correct in order to avoid over-fitting. Moreover, Some researchers studied the problem using Twins Support Vector Machines (TWINsSVM). Comparisons on classification algorithms between TWINsSVM and standard SVMs revealed that TWINsSVM can achieve marginally higher performance. Several Computational Intelligence classifiers were also reported in the literature, such as Artificial Neural Networks (ANNs) [16], Fuzzy Sets and Evolutionary Algorithms, with the latter being a good feature selection method. The list of ANNs includes Multi Layer Perceptrons (MLPs) [1], Probabilistic Neural Networks, Vector Quantization networks and Deep Neural Networks. In addition, MLP various architectures have been tested, like All-Class-in-One-Network (ACON), where all the classes are placed in a single network and One-Class-in-One-Network (OCON), where an individual single network is responsible for each and every class. Specific advantages of ANNs include increased effectiveness in modeling nonlinear mappings and better classification performance than HMM and GMM when the number of training examples is relatively small. However, there is no common rule for setting the optimal ANN topology, which is usually defined ad-hoc. The topology, along with the selection of the activation functions, the number of training epochs, the learning rate and the validation methods, affects the reported results in a way that makes performance comparisons an extremely hard task. Decision Trees have also been assessed as classifiers with the well-known C4.5 algorithm leading the relevant studies[6], while the Random Forest (RF) classifier was assessed in [22][26]. Random forest (or random forests) is an ensemble classifier that consists of many decision trees and outputs the class that is the mode of the responses provided by individual trees. Among the advantages of RFs that can be applied in emotion recognition from speech is the fact that they run effectively on large databases, handling thousands of input features without feature detection. However, few researchers choose to implement RF, because the resulting classifications are difficult for humans to interpret as RFs present a tendency for data over-fitting [22].

VI. Conclusion

The speech signal conveys not only words and meaning but also emotions which can clearly define the meaning of the words and the accurate identification of emotion helps to implement the human machine interface to extract the information from the speech. The main goal of the present work is to implement a computer assisted application in text to speech system which may be applied in areas like virtual agents, electronic games etc.

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Impact of Social media on youth: A Review

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Abstract: Students use social media and get encouraged by way of it. It relies upon on the usage that whether or not they are inspired in right or wrong route. Youngsters typically don't discuss about knowledge, they just share it or like it and the problem just stays focused on web only. Despite the superb benefit of rapid sharing of information, social media permits people to create fake identities and superficial connections, causes despair and is a number one recruiting device of criminals and terrorists. The overuse of those social media sites on each day has many negative consequences on the physical and intellectual health of college students making them lethargic and unmotivated to create contact with the human beings. This study is focused on the impact of social media on students and youth which can be negative or positive. Here I discussed sixty six papers and analysed them using N Vivo software.

Keywords: WWW; Networking; Youth; Information; Communication; web; social media

I. Introduction

Students prefer spending a plentiful quantity of time on those social networking web sites which maintains them far from their very own reason of existence and interacting. Their social gatherings are hampered because browsing these social networking websites holds them extra concerned for which they're bound to ignore other social activities in their lives. However a few positives consequences are also there like meeting humans you may not have met outside the social media boards, sharing ideas past the geographical boundaries. Some of the studies which I reviewed imply the bad impact of social media in phrases of Time spend, existence style, fitness danger, privacy and so on.

Teens are becoming extra privy to the social troubles in particular from Facebook like sites. However as a substitute of getting the information the teens usually don't discuss them, they just share it or love it and the difficulty just stays centered on internet only. Most of the people suppose that teenagers can play a fantastic role in changing our society. Some research monitor that, Facebook and WhatsApp are the most famous among many of the youths; it offers people with a manner of retaining and strengthening social ties which can be beneficial to both social and academic sports.

The parents should check the stability on their children once they use the net. They ought to be on protect whether or not they may be the use of it for suitable time period or no longer. The peers and teachers should also assist students make them aware about the negative effects and

give an explanation for what they're dropping within the real global by way of sticking to these social networking web sites. Social networking definitely portrays both positive andnegative effects at the youth. It's the decision of a person to make whether or not to continue the use of the sites or no longer.

It's very critical to overcome this problem. How can parents alleviate the poor components of social media whilst enhancing upon the fine consequences? Moderating their get admission to social media is one super technique. Maximum of the bad aspects may be conquering by using reducing the amount of time spent on social community sites. Being attentive to their educational progress and addressing any troubles will move an extended way in the direction of preserving the negative components of social media from influencing them. Offer enough time for face-to-face social interplay, like having some circle of relatives entertainment time in which you speak their studies in a comfy surroundings or inviting friends and own family over for get-together, providing a laugh, face-to-face social interaction with cherished ones. All this we help us to reduce the terrible impact of social media on the students with a view to in flip advantage our younger era.

It focused on understanding digital conduct, and perceptions of chance and protection amongst these active, young users of virtual and social media. As this turned into ordinarily a qualitative observe, the findings are not always representative of Kenyan young humans at large.

The arena extensive net and the social networking web sites are truly starting up broader avenues of verbal exchange, on the equal time; addiction to on line social media is rising. Making buddies with unknown human beings and increasing the numbers in 'friend list' in social networking sites is probably considered as occurring and modern-day however can pose a tangible threat to one's privacy. Consequently, whilst taking part within the social networking web sites the young customers are required to be aware and vigilant. For younger human beings to be aware and vigilant they should be knowledgeable about the pro and cons which must be accomplished by the SNS managers who have to definitely and legibly provide facts in the social networking websites approximately safety worries and private problems while avoiding felony jargon in order that it's miles really understood in particular by way of young human beings.Spending greater time on social networks reduces the pride that kids feel with all elements in their lives, except for his or her friendships. Spending one hour an afternoon chatting on social networks reduces the probability of being completely happy with existence. This isn't always a trivial effect – being three times as big as the envisioned negative impact on wellbeing of being in a single discern household and is also large than the effect of gambling truant. Looking at the extraordinary factors of existence, the biggest effects are for pleasure with circle of relatives and college attended and the smallest results are for appearance and school paintings. They also discover three feasible factors for why social media use can also have a terrible impact on Youth wellness. There are two motives; 'social comparisons' and 'cyber bullying', suggesting multiple channels via which these adverse consequences may additionally function.

II.   Literature Review

Khurana N (2015) located that "The goal organization prefers spending a plentiful quantity of time on those social networking web sites on a median of greater than 2 hours a day which keeps them far away from their personal motive of existence and interacting with their own

herbal environment. Their social gatherings are hampered because surfing those social networking sites maintain them extra concerned for which they are bound to disregard different enormous social activities in their lives."

Dr. A. Jesu Kulandairaj (2014) stated that Social Networking web sites influence the way of life of youth in order that the brands and corporations can make the most the space of Social Networking sites to create loyalty amongst kids. If the Social Networking web sites promote a healthful life fashion via its posts, videos and messages, so that it will help to increase a healthful young era.

Syed Muhammad et al. (2014) unearths that the immoderate users inside the instructional computer labs use the social media forms for comments, chatting, image and video sharing and texting and many others. This common touches the nearly half of the sampled populace. This shows that they ignore their number one cognizance on their take a look at and studies related activities while making use of the ability of internet in connecting with their buddies on the social media networking boards with their average utilized time between 30 to 60 mins.
Rita Njoroge (2011) examines the troubles of the relation between social media and its effect on behavior alternate of the teens.

Keli Wheeler (2015) observed that "negative impacts of social media are starting to surface making procrastination easier and dozing tougher. these issues can handiest grow and boom the manner that the net does. It's a incredible idea to display teens usage of media to understand what they are doing, in which they may be going, and how much time is simply being spent on networks."

Annapoorna Shetty et al. (2015) stated high quality use of social media can expand the teenagers's instructional profession, their capabilities, higher dwelling style, to adopt new tendencies, fashion, and anthropology so on.Parvathy J., Suchithra R. 2015 founds that every era has its positives and negatives and those who are using has to extra cautious in using them and asked most effective use them for right purpose.

Ms. Shabnam et al. 2014 discovered that children are getting greater privy to the social issues specially from fb. but instead of having the expertise the youth typically don't speak them, they simply percentage it or find it irresistible and the issue simply remains targeted on web most effective. most people assume that teenagers can play a effective position in changing our society that is represent in most of the responses to distinctive queries.

Selasi Kwame Ocansey et al. 2016 concluded that the teens should be knowledgeable on better utilization of social media as a way to reduce time wastage on chatting and different irrelevant engagements that are not of predominant significance on their lives. also, stakeholders and network companies need to come up with way of filtering records that reaches the younger humans thru social media structures. this could curtail exposing them to pornographic and other unwarranted materials. To communicate efficiently to the young people, we recommend that colleges and authorities corporations need to embody social media as one among their manner of verbal exchange.
Whitney Sue Thoene 2012 concluded that average, college students who use social media extra frequently get hold of extra correspondence from corporations, and those college students then use the promotions. consequently, businesses have to use Facebook and Twitter to achieve the patronage of college students however be cautious of overloading them with too much data.

Dr. Pooja Deshmukh et al. 2014 found that Social Networking sites are very popular most of the youths with most people of them pointing out that they are energetic members of social networks.

Qingya Wang, Wei Chen Yu Liang 2011 indicated that maximum college students could favor to use social media and spend many hours checking social media web sites. Social networking is virtually affecting students' efficiencies in addition to their grades.

Aida Abdulahi et al. 2014 located that human beings continue to be unaware of data sharing policies, although the guidelines are without a doubt said. And if they have read them, they're now not showed about the impact. This have a look at additionally indicates that people do now not recognize how their personal records can be shared.

Dr. Indrajit Roy chowdhury , Mr. Biswajeet Saha. 2015 said that thru this social networking site platform offers a chance among the young generation in Kolkata however also its useful blessings to customers are friendlier and they're frequently meet for some time whether they don't have enough time to meet to make a platform for eco-communication.

Jacob Amedie 2015 summarized that in spite of the high-quality gain of speedy statistics sharing, social media allows human beings to create fake identities and superficial connections, causes melancholy and is a primary recruiting tool of criminals and terrorists.Waqas Tariq et al. 2012 observed that the social networking web sites has end up critical want nowadays, but it must not be motivated at all. it can wreck the destiny of young adults and youngsters and it had a very awful impact on training as it is mentioned above.Chiemela Queen Adaugo et al. 2015 concluded that during modern day facts Age, the wedding of pc to contemporary media has facilitated sweeping modifications to arise before the eyes of our youths and our conventional beliefs.

Onyeka Ndidi Camilia et al. 2013 founds that there is need for college kids to study time control and to allocate, to each challenge, a particular timeframe. college students and teenagers need to constantly make out special time for the use of the SNSs and now not to commit all their available time to it.A.T.M Shahjahan 2014 founds that Positives effects assembly humans you can no longer have met outdoor the social media forums and Sharing ideas past the geographical obstacles.M. Nick Hajli 2014 founds that Networking on social media websites supports agree with-constructing mechanisms in e-trade and social commerce adoption. E-companies might also inspire clients to return online and use social media to develop trust. Article Social media paperwork have altered how youngsters socialize and learn, and lift a brand new set of problems for educators, mother and father, researchers and policymakers to don't forget. Adults can help young adults consider on line presence in moral and ethical methods especially to help young adults in know-how the outcomes for themselves and others of participation in the socially networked global.

Dr. Sankar Kumar Chakraborty 2015 exhibits that, Facebook is the most popular websites most of the youths; it offers individuals with a way of keeping and Strengthening social ties which can be useful to each social and academic settings.Elisabeta Ioanăs, Ivona Stoica 2014 founds that technology gives customer the energy to investigate merchandise to label them and criticize them in identical degree, and more. consequently many agencies today have pages on social networks to complement the information held about products, held by the feedback of clients approximately merchandise and generally tend to narrate greater to a organization after reading various reviews. The paper is associated with the impact of social media on consumer behavior, consequently it has been made a quantitative research. The sample counted 116 respondents and from the statistical perspective, the conclusions were installed in terms of the univariate and bivariate evaluation. Following the evaluation of the research variables we can

make a consumer profile that uses social networks. Likewise, after doing the complex statistical evaluation the usage of SPSS and the analysis presented with the aid of the online platform the host of questionnaire, it can be seen how a good deal it's far encouraged and the actual impact of social media pondered within the behavior changes.Ceulemans, Pauline, W. 2012 concluded that kids might not know how a great deal is an excessive amount of, and they might accidentally abuse their era assets. educating students on generation may want to resolve this trouble.

N. Vijaya Kumar1, S. Hema2 2015 located that the overuse of those social media sites on a each day foundation has many negative consequences on the physical and intellectual health of college students making them lethargic and unmotivated to create contact with the human beings in man or woman. The dad and mom should check and stability on their children once they use the net. They ought to be on protect whether or not they may be the use of it for suitable time period or no longer. The peers and teachers should also assist students make them aware about the negative effects and give an explanation for what they're dropping within the real global by way of sticking to these social networking web sites. Social networking definitely portrays both nice and negative effects at the youth. it's far decision of an person to make whether or not to continue the use of the sites or no longer.

Mrs. Vishranti Raut, Mrs. Prafulla Patil 2016 concluded that according to the above study we got here to recognize the diverse positive and terrible impacts of social media on training or college students. it's miles very critical to overcome this problem. How can parents alleviate the poor components of social media whilst enhancing upon the fine consequences? Moderating their get admission to social media is one super technique. Maximum of the bad aspects may be conquer by using reducing the amount of time spent on social community sites. Being attentive to their educational progress and addressing any troubles will move an extended way in the direction of preserving the negative components of social media from influencing their research. offer enough time for face-to-face social interplay, like having some circle of relatives entertainment time in which you speak their studies in a comfy surroundings or inviting friends and own family over for get-together, providing a laugh, face-to-face social interaction with cherished ones. All this we help us to reduce the terrible impact of social media on the students with a view to in flip advantage our younger era.

John D, Catherine T 2008 cautioned that modern-day kids cultures are an increasing number of various and fragmented, and that they may be quality visible, no longer as a matter of self-contained "subcultures" however in a more fluid manner, as "scenes" or "life" to which young people can be handiest briefly connected. nonetheless, there was tremendously little studies on the extra mundane, even conformist, cultures of younger individuals who aren't participants of such "dazzling" or oppositional groupings (or certainly on affluent middle-magnificence youngsters).

The observe became commissioned with the aid of UNICEF 2013 involved protecting digital teenagers clinics in 4 places in Kenya, with children and younger human beings who have get entry to to cellular telephones and the net. It focused on understanding digital conduct, and perceptions of chance and protection amongst these active, young users of virtual and social media. As this turned into ordinarily a qualitative observe, the findings are not always representative of Kenyan young humans at large.

Dr. Saswati Gangopadhyay 2014 founds that the arena extensive net and the social networking web sites are truly starting up broader avenues of verbal exchange, on the equal time; addiction to on line social media is rising. Making buddies with unknown human beings and increasing the numbers in 'friend list' in social networking sites is probably considered as occurring and modern-day however can pose a tangible threat to one's privacy. online global is abysmal and what is projected won't be real. consequently, whilst taking part within the

social networking web sites the young customers are required to be aware and vigilant. For younger human beings to be aware and vigilant they should be knowledgeable about the pro and cons which must be accomplished by the SNS managers who have to definitely and legibly provide facts (now not disclaimers) in the social networking websites approximately safety worries and privateers problems while avoiding felony jargon in order that it's miles really understood in particular by way of young human beings, so that the cyber international will become a safer location to navigate through all netizens each young and old.

Emily McDool et al. 2016 located that spending greater time on social networks reduces the pride that kids feel with all elements in their lives, except for his or her friendships. Spending one hour an afternoon chatting on social networks reduces the probability of being completely happy with existence typical via approximately 14 percentage points. This isn't always a trivial effect – being three times as big as the envisioned negative impact on wellbeing of being in a single discern household and is also large than the effect of gambling truant. Looking at the extraordinary factors of existence, the biggest effects are for pleasure with circle of relatives and college attended and the smallest results are for appearance and school paintings. They also discover three feasible factors for why social media use can also have a terrible impact on kids's wellness. They find some guide for all three motives; 'social comparisons', 'finite resources' and 'cyber bullying', suggesting multiple channels via which these adverse consequences may additionally function. Further, they find that women suffer extra destructive consequences than boys and in particular experience less glad with their appearance and faculty attended the greater time they spend chatting on social networks. One shortcoming of this work is that our statistics do no longer allow us to become aware of what children are doing whilst 23 they are accessing social networks and given the multiplicity of makes use of those sites it is viable that the results on wellbeing will vary. "

Rianne C. Farrugia 2013 stated that based at the data found on this research, it's miles honest to mention that SNS together with fb are converting the manner couples are developing their relationships.Guia Tina Bertoncini 2013 founds that the dissemination and use of knowledge have changed particularly within the closing centuries. The improvement of writing was a decisive step to store expertise approximately humans, time, area and transport. over the years, scientists,writers, reporters and publishers unfold a brand new sort of applicable and beside the point information; the get admission to to the design of mass media changed into de facto confined to this very achievable organization. journalists, writers, and scientists have been able to publish their records and their view on things.

Jenna Palermo Christofferson 2016 offered a scientific overview of research surrounding the effects of SNS on young people's social and emotional improvement. SNS are an intriguing new region to study because the technology is such an critical a part of adolescent existence. Given the popularity, parents and educators have enormous worries about the effects of SNS. The qualitative and quantitative research discuss each benefits and dangers to youngster's social and emotional health. The studies have proven how youngsters use SNS, build way of life in those on line groups, and carry out communique behaviors which might be linked to their development and fantastic social outcomes. moreover, they also display great dangers SNS has on young adults' health such as, cyber-bullying and NSSI behaviors.

Shabnoor Siddiqui Tajinder Singh 2016 founds that because the era is developing the social media has end up the recurring for every and everyone, peoples are seen addicted with those generation every day. With distinct fields its effect is distinct on humans. Social media has improved the excellent and fee of collaboration for college students. business makes use of social media to enhance an employer's overall performance in numerous approaches inclusive of to accomplish commercial enterprise goals, increasing annual sales of the agency. children

are visible in touch with these media daily. Social media has various deserves but it also has a few demerits which have an effect on humans negatively.

Jennifer Alejandro 2010 observed that the greater time people spend online, the higher the possibility that the time spent can be monetized. internet 2.0 technology will soon pave the way for a web three.zero international.

Alana Maurushat et al. 2014 Given the reality that social networking sites and mobile technologies are financial and realistic and may be more powerful that different types of communications, they have a brilliant capacity for use as a way to affect social exchange. It seems that social networking web sites in Arab international locations are going to live legal guidelines 2014, three 688 furnished that they are no longer blocked—a likely reality in lots of these international locations. In March 2014, for example, the Turkish high Minister threatened to prohibit Twitter altogether [52]. Turkey joins international locations which includes China, Iran, and Vietnam who routinely block fb, Twitter and Youtube throughout times whilst incidents might indicate a likeliness of concern and dissent. The blockading of social media in those international locations has been on and off since 2009. even as it's miles genuine that regulations of social media appeal to public outcry, the fact is that those blockings are not becoming out of date. It remains to be seen how governments will cope with social media within the wake of recent incidents.

Ethel Lee 2013 discovered that customers do no longer feel endorsed to generate the word of mouth through social media, and this warning signs may mean that entrepreneurs might must perform sure moves so as to provoke those conversations. therefore, a furture studies may be performed based totally on this attitude in investigating the motives associating with this precise feeling and how it may be altered with a view to make use of social media as an powerful buy validation device.

Amandha Rohr Lopes 2014 discovered that each facebook and net penetration served as a illustration of all social media outlets. possibly a better manner to operationalize this variable could be thru a degree of all fb, Twitter, YouTube, and blog accounts; but, information on membership to those web sites aren't effectively available to researchers because of certain infringements on those bills. considering the fact that social media in wellknown is any such new phenomenon within the international, it's also viable that there may be a put off problem to this observe in which the consequences have not completely pondered onto the data but.

Natascha Zeitel-financial institution Ute Tat 2014 analyzed the feasible outcomes of social media on each, people and the society as an entire. First we illustrate the contemporary scenario of social media in terms of statistics and figures earlier than we deepen selected aspects of latest varieties of digital interaction.

Racha Mourtada Fadi Salem 2012 concluded that during the "Arab Spring," social media performed a essential role in maximum of the popular moves within the vicinity. according to our studies findings, it changed into promising that, coupled with the robust increase of social media utilization among children in the Arab location, there is a pervasive belief of social media as an enabler for youngsters and women's empowerment.

Ellie Petraki et al. 2013 encouraged a 'pal device'. all of the children are assigned to every other infant of their class. This character ought to be a person they already feel at ease with. They emerge as each other's trustee. We feel that this is a superb concept because the kids stated that they experience relaxed telling a chum approximately their problems.

Cathy J. Cohen, Joseph Kahne turbines university 2011 founds that unique caution wishes to be taken in drawing inferences about the latter organization, and the tests of statistical significance offered in this report account for this uncertainty.

Social Media record 2016 stated that as Australia's #1 advertising services company, our purpose is to interact customers with Australian organizations. We make this occur via some of leading manufacturers – phone book, White Pages, proper neighborhood, Whereis and bypass and our professional digital knowledge. Our virtual knowledge is what sets us aside – we deliver groups a aggressive aspect via web sites, search engine advertising and optimisation, statistics, and via our virtual advertising and marketing enterprise, located.Siobhan Mcgrath 2012 located that new media technologies at the moment are an intrinsic part of family and household existence. This changed into obvious as each household changed into immersed with a selection of different virtual technologies, the whole thing from mobile phones to domestic computer systems. Madison Ganda 2014 concluded that while the results of the regression display that there aren't any substantial relationships between the variables, finding a advantageous correlation among the effect of social networking sites and the formation of identification and understanding of self is still viable.

III.   Research Methodology

The research is exploratory in nature. Research papers have been retrieved from the web journals of SAGE, technology Direct, Emerald and different online resources like Google,Google pupil, reviews and so on. since the examine turned into focused at the social media effect amongst college students, so the key phrases like social media, youngsters, college students, verbal exchange with own family were used to discover the relevant papers for analysis. Sixty research papers were reviewed which were from the renowned Journals. N Vivo software program is used for the analysis motive.

IV.   Findings and Discussion

With the help of NVivo software all sixty papers were analyzed for 100 most frequently used words. The results are presented below in the form of a word cloud.

Figure 1 : Word Cloud of Most Frequently used words

The following table shows the 100 most frequently words used in the literature.

S.No	Word	Length	Count
1	social	6	9994
2	media	5	6758
3	people	6	2758
4	use	3	2504
5	sites	5	2474
6	online	6	2443
7	networking	10	2361
8	youth	5	2188
9	facebook	8	1880
10	information	11	1863
11	young	5	1851
12	new	3	1741
13	research	8	1618
14	internet	8	1604
15	also	4	1461
16	one	3	1395
17	students	8	1383
18	study	5	1378
19	time	4	1315
20	communication	13	1171

21	users	5	1170
22	digital	7	1151
23	friends	7	1058
24	may	3	1009
25	used	4	916
26	using	5	915
27	children	8	892
28	many	4	887
29	technology	10	849
30	self	4	829
31	impact	6	817
32	school	6	815
33	identity	8	806
34	2011	4	790
35	network	7	756
36	access	6	754
37	university	10	751
38	mobile	6	736
39	life	4	730
40	among	5	724
41	respondents	11	715
42	like	4	707
43	http	4	701
44	data	4	692
45	www	3	678
46	networks	8	675
47	well	4	662
48	2012	4	661
49	personal	8	659
50	education	9	656
51	individuals	11	644
52	group	5	638
53	site	4	638
54	public	6	631
55	twitter	7	628
56	way	3	621
57	learning	8	615
58	world	5	614
59	content	7	609
60	relationship	12	609
61	different	9	605
62	technologies	12	602
63	2010	4	599
64	websites	8	597

65	often	5	594
66	political	9	584
67	2014	4	582
68	2009	4	581
69	age	3	576
70	see	3	575
71	com	3	571
72	based	5	559
73	journal	7	559
74	number	6	559
75	important	9	553
76	news	4	541
77	others	6	541
78	teens	5	537
79	sns	3	534
80	usage	5	531
81	2008	4	524
82	groups	6	517
83	even	4	514
84	negative	8	512
85	women	5	510
86	participation	13	508
87	society	7	502
88	table	5	502
89	however	7	501
90	survey	6	501
91	work	4	495
92	college	7	492
93	make	4	488
94	family	6	487
95	found	5	483
96	2007	4	478
97	studies	7	468
98	parents	7	463
99	2013	4	462
100	within	6	462

Table 1: Cluster Analysis based on the frequency of words in Literature Review
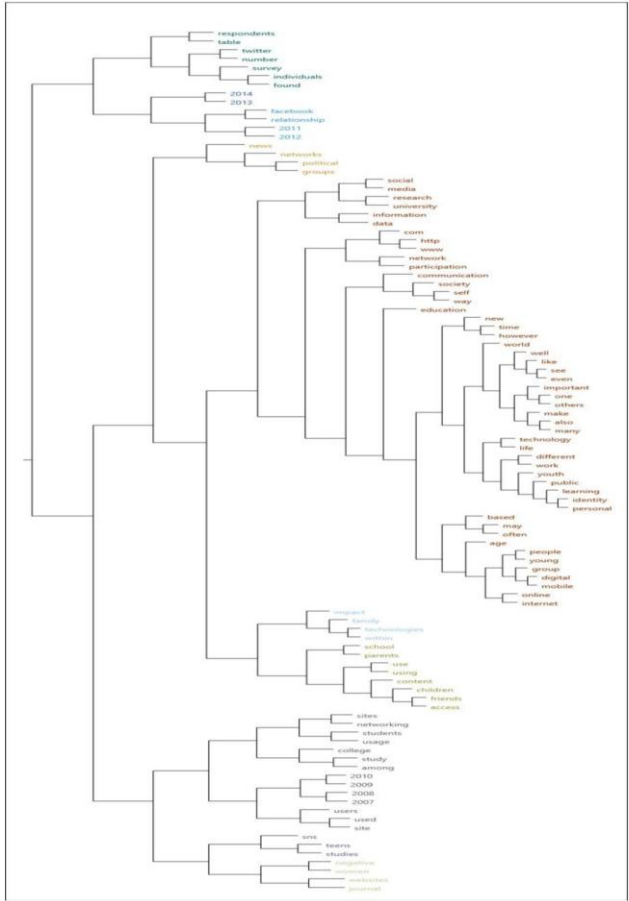
Tree Map of Literature Review

social	people	networking	young	one	users	childre	identity	among	respon	like	http	data	www	netwo
			new	students	digital	many	2011	twell	site	conte	relatio	differ	techn	2010	webs
	use	youth				techno	network	2012	public	often	com	based	journ	numb	impor
			research	study	friends		access	perso	twitte	politic	news	2008	group	even	nega
	sites	facebook			may	self		2014	others	wom	how	surve	work
media		internet	time			impact	univers	educa	way	2009	teens	partic	colle	found	2007
	online	information	also	commu	used		mobile	individe	learni	age	sns	socie	make	studi	2013
				using	school	life	group	world	see	usage	table	famil	pare	withi

V. Conclusion

Tree map represents that social & media are the main root which follows people use online sites. This represents that the research is going in the right direction. Social, Media, People, youth, online, information, sites etc. words are most frequently occurring words with the frequency 9994, 6758, 2758 etc. Literature represents the social media impact on youth which can be positive and negative both.

This tree map represents high relation between social & Media; People, use, online & sites; Youth, networking & information. This represents that we have researches on social media with relation to youth, networking and information. But there is huge research gap in relating social media with www & http protocol. "WWW" is mentioned in the fourteenth layer in this tree Map. This represents that social media is very rarely linked with www in the past researches. "WWW" is the core of internet & very important to be referred with social media. "HTTP" is mentioned in the 12th Layer in this tree map, which represents that social media is very rarely linked with the HTTP in the past researches. Hypertext transfer protocol is very important factor, while we work on social media. Age is represented on the eleventh layer of the tree map which is very important factor representing the mental ability, seniority and responsibility level of a person using social media. This factor can be considered in future to find more realistic relationship between age and social media. Women is in thirteenth layer in this tree map, which represents that the impact, usage and relationship of women factor with respect to social media is rarely considered by the researchers. Women is very important factor which has to be considered in relation with social media, because women effects the family most and hence the nation. Self is used in seventh layer in the tree map. This is also a very important factor, as if we found a positive relation between our-self and social media implies that we are gaining something important which is fruitful to us. But if it is negative then we should found some areas to be work upon. This will be beneficial if done in a proper way. It leads to self-discipline.

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