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IJCRT – Vol 2017-18
Vol- 6, Year 2017- 2018 UGC and ISSN Approved

An International Open Access Journal
UGC and ISSN Approved | ISSN: 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS

Vol- 6, Year 2017-2018

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS

International Peer Reviewed, Open Access Journal

ISSN: 2320-2882 | Impact factor: 5.97 | ESTD Year: 2013

UGC and ISSN Approved Journals.

Website: www.ijcrt.org

Website: www.ijcrt.org

2017-18

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International Peer Reviewed, Open Access Journal

ISSN: 2320-2882 | Impact factor: 5.97 | ESTD Year: 2013

Volume- 6, Year 2018 | ISSN (Online): 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS is published under the name of IJCRT publication and URL: www.ijcrt.org.

Published in India

Typesetting: Camera-ready by author, data conversation by IJCRT Publishing Services – IJCRT Journal.

IJCRT Journal, 2018, WWW.IJCRT.ORG

ISSN (Online): 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT) is published in online form over Internet. This journal is published at the Website http://www.ijcrt.org, maintained by IJCRT Gujarat, India.

ISSN 2321-9939

9 772321 993002

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Techno Pedagogical Attitude Of Secondary School Teachers Of Kerala In Relation To Their Digital Literacy: A Research Report

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***Abstract*:** The study was conducted to find out the level of Techno Pedagogical Attitude and Digital Literacy of secondary school teachers in Kerala. Stratified Random sampling technique was adopted by selecting 360 secondary school teachers as the sample of the study. Survey method was used for the study. Techno Pedagogical Attitude Scale and Digital Literacy Test (Sareef & Baby, 2017) were used to find out level of Techno Pedagogical Attitude and Digital Literacy among secondary school teachers of Kerala. Descriptive statistics, t-test and Pearson's product moment co efficient of correlation(r) are the statistical techniques used to analyse data. The study was found that secondary school teachers possess high, average and low level of Techno Pedagogical Attitude and Digital literacy. Techno Pedagogical Attitude of secondary school teachers are not differ on subsamples of gender, locale of the schools and type of management of schools. But Digital Literacy among Secondary school teachers based on gender and locale of the schools are differ and not differ on the subsample of type of management of schools. The study also reveals that there exist moderate positive correlation between variables of Techno Pedagogical Attitude and Digital Literacy.

Index Terms: Attitude, Techno Pedagogical Attitude, Secondary school Teachers, Digital Literacy

I. INTRODUCTION

Today, technology serves as a major role in shaping new global economy and producing fast changes in the society. There is a widespread acknowledgement that technology can be used to enhance both learning and teaching. India has the capacity to become the hub of technology enabled teaching and learning with its IT valour and strong education system. It has great potential, to transform the ways in which the teachers teach and the students learn. Technology provides strong powerful tools that can help in transforming the present isolated, teacher-centred and text-bound classrooms into technology enriched, student-focused and interactive knowledge environments.

The revolutionary development in Educational technology has redefined the teaching and learning process to a greater extent. The teachers to get acquaintance with the application of recent technological principles and materials in their teaching and hence there is an urgent need to examine the techno-pedagogical competencies possessed by the teachers. Currently, teacher's lack of technical expertise in technology appears to significantly constrain possibilities of developing new and innovative computer-supported pedagogical practices. For effective technology integration happen in the classrooms, teachers should have the necessary pedagogical, content and technological competencies.

The technological revolution has led to a fundamental shift in our understanding of pedagogy and its related practices. "Technological content knowledge refers to knowledge about how technology may be used to provide new ways of teaching content." (Niess,2005). But today the techno-pedagogical competency is very much needed for teachers in teaching and learning process, as it facilitates effective teaching and learning. The techno pedagogical competency is nothing but the ability of the teachers to make use of technology effectively in teaching. Technological pedagogical content knowledge (TPCK) was introduced to the educational research field as a theoretical framework for understanding teacher knowledge required for effective technology integration (Mishra & Koehler, 2006). Techno pedagogical content knowledge (TPACK) is a frame work to understand and describe the kinds of knowledge needed by a teacher for effective pedagogical practice in a technology enhanced learning environment."The TPACK frame work highlights complex relationship that exist between content, pedagogy and technology knowledge areas and may be useful organizational structure for defining what it is that teachers need to know to integrate technology effectively" (Archambault & Crippen,2009)

To integrate technology, teachers must possess requisite technology-based skills, knowledge, abilities, and attitudes (Teclehaimanot, Mentzer, & Hickman 2011). Now, techno pedagogical attitude of teachers has been going on smaller. The main reason is they are not digitally literate. " Digital Literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilitates to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, construct new knowledge and create media"(Casey & Bruce ,2010).The illiterate of the 21st century will not be those who cannot read and write but those who cannot learn, unlearn and relearn. These may aid in understanding issue of digital divide in terms of digital natives and digital immigrants. So Kerala initiated in bold attempts to support schools with IT infrastructure, IT based learning resources and also provides training to teachers. In 2016 onwards IT @ school initiated training to total teachers in Kerala for enhancing IT

enabled education. This has resulted in enhancing techno pedagogical attitude of teachers in varying school systems, curricular contexts and classroom practices in Kerala.

II. NEED AND SIGNIFICANCE OF THE STUDY

Transition, transformation and revolution are the prime scenario of present educational system. This tendency requires a change in knowledge competencies and skills to deal with technological advancement. Technology is the means to enhance teaching- learning quality. Education systems in Kerala move to technology dynamic society. Kerala school curriculum 2013 focused on IT enabled education. Presently most of the schools have IT @ of school, smart class, and digital class. But teachers do not try to utilize such resources for effective teaching learning process because of the stable attitude of teachers towards IT enabled teaching. In this aspect teachers need to be trained on how to adapt on new technology and how to successfully integrate technology into his/her subject areas to make learning more meaningful.

The challenge for preparing 21st century teachers to use technologies effectively in their courses has led to many different approaches to using technology in teacher education programs. Most teacher education programs have redesigned their curricula to make the pre-service teachers competent in using technologies in their future teaching profession (Yildirim, 2007). While research exists to illustrate how often or the kinds of technology employed in classrooms (Pitler, 2011), there is not enough research for best practices in training teachers during pre-service programs to demonstrate how to effectively integrate 21st Century technologies into instruction. Most of the researchers found that teachers are facing lot of techno pedagogical difficulties due to their lack of digital literacy. The present study focused on examining teachers 'attitude towards technology, their level of digital skills as well as their experiences with technology and how they used technology in their current day to day educational practices. So through this study the investigator tries to find out Techno Pedagogical Attitude of Secondary school teachers in relation to their Digital Literacy and provide some suggestions for better practices.

III. OBJECTIVES OF THE STUDY

The objectives set forth for the study are the following:

i) To find out the level of Techno Pedagogical Attitude of secondary school teachers in Kerala.

ii) To find out the level of Digital Literacy of secondary school teachers in Kerala.

iii) To test whether there exist any significant difference in the level of Techno Pedagogical Attitude of secondary school teachers based on:

a. Gender

b. Locale of the schools

c. Type of management of schools

iv) To test whether there exist any significant difference in the level of Digital Literacy of secondary school teachers based on:

a. Gender

b. Locale of the schools

c. Type of management of schools

v) To test whether there exist any significant relationship between Techno Pedagogical Attitude of secondary school teachers and their Digital Literacy.

IV. HYPOTHESES OF THE STUDY

The hypotheses formulated for the study is following.

i) There will be significant difference in the mean scores of Techno Pedagogical Attitude among secondary school teachers on the basis of:
a. Gender
b. Locale of the schools
c. Type of management of schools

ii) There will be significant difference in the mean scores of Digital Literacy among Secondary school teachers on the basis of:
a. Gender
b. Locale of the schools
c. Type of management of schools

iii) There will be significant relationship between Techno Pedagogical Attitude of Secondary school teachers and their Digital Literacy.

V. METHODOLOGY OF THE STUDY

Methods of the study:

Survey method was adopted for the study

Population and sample:

The population of the study is the secondary teachers working in schools recognised by Kerala government. The present study was conducted on sample of 360 secondary school teachers from 14 schools in three districts of Kerala (Kozhikode, Kannur, and Malappuram) selected by stratified sampling technique giving due to the representation of characteristics like gender, locale of the schools and type of Management of Schools..

Tool used:

To measure the variable, investigator developed Techno Pedagogical Attitude scale and Digital Literacy test with the help of supervising teacher(Sareef & Baby, 2017). For measuring reliability of the scale investigator followed Cronbach's Alpha which value found to be 0.72 and the value of Cronbach's Alpha for the test found to be 0.78. The validity of the scale and test is ensured using face and content validity.

Mode of Data collection and Data Analysis

After conducting standardised test on scale and deciding the sample size , the investigator prepared a list of schools from where the data to be collected. Then investigator contacted heads of high schools with a letter of recommendation to obtain permission for collecting data from that institution. The investigator met secondary school teachers and necessary arrangements were made to collect data. While administering the tools, the method of responding was explained clearly. Necessary clarifications of doubts were given whenever required. No time limit was enforced to respond the items. Then the response sheet along with tools were collected and sorted for analysis.

Soon after the collection of data, the investigator valued the data sheets of Techno Pedagogical Attitude and Digital Literacy. All the response sheets were scored as per the scoring scheme of the tools prepared. Total score of each item was calculated in the scale of Techno Pedagogical Attitude and test of Digital Literacy.Techno Pedagogical Attitude scale consists of 42 items. A respondent has to respond to 42 items by choosing any one of the three alternatives given i.e., Agree, Undecided and Disagree. The respondents have to mark their responses to each item in the appropriate columns corresponding to the three alternatives. For positive items the respective scores to the three responses are 3, 2, and 1. For negative items scoring was done in the reverse order. The total score was calculated for each item and further analysis was done after consolidation. The Digital Literacy Test consists of 40 objective type questions arranged in easy, average and difficulty level. The response sheets were scored according to the scoring scheme prepared. The teachers were instructed to respond each item by putting (√) mark under the response final suitable for them against the option is A, B, C and D. For the correct answers gave' 1 'marks and wrong answers gave '0' marks. Finally, for finding out and assess the Digital Literacy the investigator added the scores. The analysis of the data was carried out with the help of appropriate statistical techniques – descriptive statistics, t- test and Pearson's product moment co efficient of correlation(r)

VI. ANALYSIS AND INTERPRETATION OF DATA

Level of Techno Pedagogical Attitude among secondary school teachers.

The different levels of Techno Pedagogical Attitude among secondary school teachers was determined by classifying the whole sample into three groups- low ,average and high in the conventional procedure of finding σ distance from mean $\bar{x}$. The standard deviation and means of the score of Techno Pedagogical Attitude for total sample are found to be 8.31 and 102.67 respectively. Secondary school teachers who obtained scores above or equal to the value of $\bar{x} + \sigma$ were considered as high group and secondary school teachers who obtained scores below or equal to the value of $\bar{x} - \sigma$ were considered as low group. The secondary school teachers who score lie between the values of $\bar{x} + \sigma$ and $\bar{x} - \sigma$ were considered as average group. The percentage of total sample falling into three groups (low, average and high) is given in Table no 1.

Table 1. Number and percentage of secondary school teachers falling into three groups of Techno Pedagogical Attitude (High, Average and Low)

Variable	Group	Score	n	%
Techno Pedagogical Attitude	High	>/110.98	82	22.78
	Average	110.98-94	224	62.22
	Low	</94.36	54	15

Table 1 shows that the level of Techno Pedagogical Attitude of secondary school teachers for the total sample. It is evident that 22.78 percentage of the total sample has high level of Techno Pedagogical Attitude, 62.22 percentage has average level of Techno Pedagogical Attitude and 15 percentage has low level of techno pedagogical attitude. The graphical representation of the distribution of total sample in different levels of Techno Pedagogical Attitude is given in figure 1

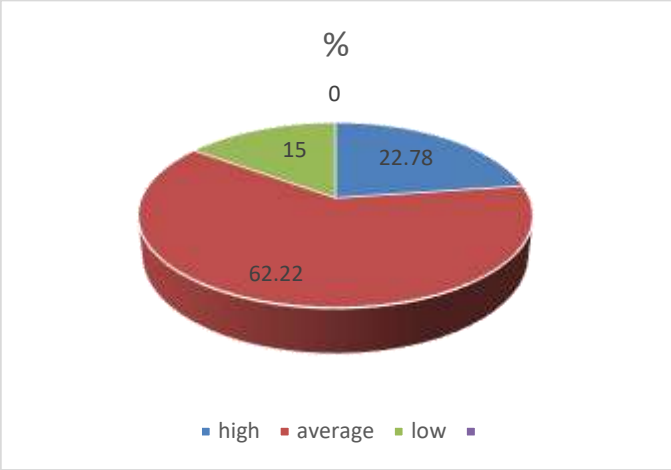

Figure 1: Distribution of total sample in different levels of Techno pedagogical Attitude

Level of Digital Literacy among secondary school teachers.

The different levels of Digital Literacy among secondary school teachers was determined by classifying the whole sample into three groups-low ,average and high in the conventional procedure of finding σ distance from mean $\bar{x}$. The standard deviation and means of the scores of Digital Literacy of secondary school teachers for the total sample are found to be 4.07and 30.86 respectively. Secondary school Teachers who obtained scores above or equal the value of $\bar{x} + \sigma$ were considered as high group and secondary school teachers who obtained scores below or equal the value of $\bar{x} - \sigma$ were considered as low group. The secondary school teachers who scores lie between the values of $\bar{x} + \sigma$ and $\bar{x} - \sigma$ were considered as average group. The percentage of total sample falling into three groups (low, average and high) is given in Table no 2.

Table 2. Number and percentage of secondary school teachers falling into three groups of Digital Literacy (High, Average and Low)

Variable	Group	Score	n	%
Digital Literacy	High	>/34.93	78	22
	Average	34.93-26.79	235	65
	Low	</26.79	47	13

Table 2 shows that the level of Digital Literacy of secondary school teachers for the total sample. It is evident that 22 percentage of the total sample has high level of Digital Literacy, 65 percentages has average level of Digital Literacy and 13 percentage has low level of Digital Literacy. The graphical representation of the distribution of total sample in different levels of Digital Literacy is given in Figure 2.

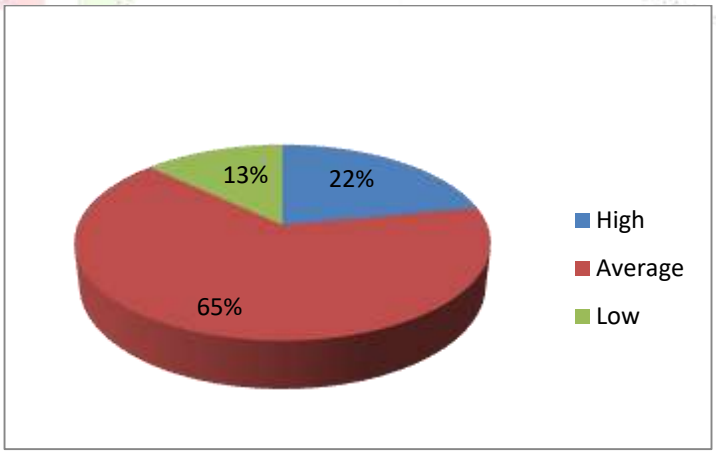

Figure 2: Distribution of total sample in different levels of Digital Literacy

Comparison of mean scores of Techno Pedagogical Attitude between male and female secondary school teachers

Table 3. Data and results of the test of mean scores of Techno Pedagogical Attitude between male and female secondary school teachers

Gender	N	Mean	SD	t-value	Level of significance
Female	220	103	7.98	0.52	NS
Male	140	102.52	8.82		

Table 3 indicates that the mean scores obtained for the male secondary school teachers on Techno Pedagogical Attitude is 102.52 and mean scores of obtained for the female secondary school teachers on Techno Pedagogical Attitude is 103 . Standard deviation obtained for male secondary school teachers is 8.82 and female secondary school teachers is 7.98. The 't' value obtained is 0.52, which is less than the table value at 0.05 level (1.96).Since the obtained value of 't' is less than table value, it can be concluded that there exists no significant difference in the level of Techno Pedagogical Attitude of male and female secondary school teachers.

Comparison of mean scores of Techno Pedagogical Attitude between urban and rural secondary school teachers

Table 4. Data and results of the test of mean scores of Techno Pedagogical Attitude between urban and rural secondary school teachers

Locale of the School	N	Mean	SD	t-value	Level of significance
Urban	180	103.05	8.27	0.88	NS
Rural	180	102.29	8.35		

Table 4 indicates that the mean scores obtained for the urban secondary school teachers on Techno Pedagogical Attitude is 103.05 and mean scores of obtained for the rural secondary school teachers on Techno Pedagogical Attitude is 102.29 . Standard deviation obtained for urban secondary school teachers is 8.27 and rural secondary school teachers is 8.35. The 't' value obtained is 0.88, which is less than the table value at 0.05 level (1.96).Since the obtained value of 't' is less than table value, it can be concluded that there exists no significant difference in the level of Techno Pedagogical Attitude of urban and rural secondary school teachers.

Comparison of mean scores of Techno Pedagogical Attitude between aided and government secondary school teachers

Table 5. Data and results of the test of mean scores of Techno Pedagogical Attitude between Aided and Government secondary school teachers

Type of Management	N	Mean	SD	t-value	Level of significance
Aided	180	103.05	8.01	1.93	NS
Government	180	101.84	8.52		

Table 5 indicates that the mean scores obtained for the aided secondary school teachers on Techno Pedagogical Attitude is 103.05 and mean scores of obtained for the government secondary school teachers on Techno Pedagogical Attitude is 101.84 . Standard deviation obtained for aided secondary school teachers is 8.01 and government secondary school teachers is 8.54. The 't' value obtained is 1.93, which is less than the table value at 0.05 level (1.96).Since the obtained value of 't' is less than table value, it can be concluded that there exists no significant difference in the level of Techno Pedagogical Attitude of aided and government secondary school teachers.

Comparison of mean scores of Digital Literacy between male and female secondary school teachers

Table 6. Data and results of the test of mean scores of Digital Literacy between male and female secondary school teachers

Gender	N	Mean	SD	t-value	Level of significance
Female	218	30.71	3.73	2.28*	0.05
Male	142	31.05	4.55		

* Significant at 0.05 level

Table 6 indicates that the mean scores obtained for the male secondary school teachers on Digital Literacy is 31.05 and mean scores of obtained for the female secondary school teachers on Digital Literacy is 30.71 . Standard deviation obtained for male secondary school teachers is 4.55 and female secondary school teachers is 3.73. The't' value obtained is 2.28, which is greater than the table value at 0.05 level (1.96).Since the obtained value of 't' is greater than table value,it can be concluded that there exists significant difference in the level of Digital Literacy of male and female secondary school teachers.

Discussion

The analysis of the mean scores of Digital Literacy of male and female secondary school teachers revealed that there exist significant difference in the level of Digital Literacy of male and female teachers. The mean score of Digital Literacy of male secondary school teachers is 31.05 which is higher than mean score of female secondary school teachers (30.73) .This indicate that male secondary school teachers are having higher Digital Literacy than female. So it can be inferred that Digital Literacy of male and female secondary school teachers are not equal.

Comparison of mean scores of Digital Literacy between urban and rural secondary school teachers

Table 7. Data and results of the test of mean scores of Digital Literacy between urban and rural secondary school teachers

Locale of the school	N	Mean	SD	t-value	Level of significance
Urban	180	31.31	3.73	2.19*	0.05
Rural	180	30.41	4.34		

*Significant at 0.05 level

Table 7 indicates that the mean scores obtained for the urban secondary school teachers on Digital Literacy is 31.31 and mean scores of obtained for the rural secondary school teachers on Digital Literacy is 30.41 . Standard deviation obtained for urban secondary school teachers is 3.73 and rural secondary school teachers is 4.34. The 't' value obtained is 2.19, which is greater than the table value at 0.05 level (1.96).Since the obtained value of 't' is greater than table value, it can be concluded that there exists significant difference in the level of Digital Literacy of urban and rural secondary school teachers.

Discussion

The analysis of the mean scores of Digital Literacy of urban and rural secondary school teachers revealed that there exist significant difference in the level of Digital Literacy of urban and rural teachers. The mean score of Digital Literacy of urban secondary school teachers is 31.31 which is higher than mean score of rural secondary school teachers (30.41) .This indicate that urban secondary school teachers are having higher digital literacy than rural. So it can be inferred that Digital Literacy of urban and rural secondary school teachers are not equal.

Comparison of mean scores of Digital Literacy between aided and government secondary school teachers

Table 8. Data and results of the test of mean scores of Digital Literacy between Government and Aided secondary school teachers.

Type of management	N	Mean	SD	t-value	Level of significance
Aided	180	30.82	4.20	0.17	NS
Government	180	30.89	3.94		

Table 8 indicates that the mean scores obtained for the aided secondary school teachers on Digital Literacy is 30.82 and mean scores of obtained for the government secondary school teachers on Digital Literacy is 30.89 . Standard deviation obtained for aided secondary school teachers is 4.20 and government secondary school teachers is 3.94. The 't' value obtained is 0.17, which is less than the table value at 0.05 level (1.96).Since the obtained value of 't' is less than table value, it can be concluded that there exists no significant difference in the level of Digital Literacy of aided and government secondary school teachers.

Test of significant relationship between Techno pedagogical Attitude of secondary school teachers and their Digital Literacy

Table 8. Pearson's 'r' for the variables Techno Pedagogical Attitude and Digital Literacy for the total sample

Sl.no	Variables	Coefficient of correlation
1	Techno pedagogical attitude	0.487
2	Digital Literacy	

Discussion of Results

From table 8 shows that, the coefficient of correlation for the variable Digital literacy with the variable techno pedagogical attitude in the case of total sample is 0.487. The magnitude and direction of 'r' indicates moderate positive correlation between the variables techno pedagogical attitude and digital literacy. It means that there is a moderate increase in Techno Pedagogical Attitude results into moderate increase in Digital Literacy and moderate decrease in Techno Pedagogical Attitude results into moderate decrease in Digital Literacy.

VII. MAJOR FINDINGS OF THE STUDY

1. The study evident that secondary school teachers possess high, average and low level of Techno Pedagogical Attitude and Digital Literacy
2. The study can inferred that Techno Pedagogical Attitude of secondary school teachers are not differ on the subsamples of gender, locale of the schools and type of management of schools
3. The study revealed that there exist significant difference in the level of Digital Literacy of male and female teachers. The mean score of Digital Literacy of male secondary school teachers is 31.05 which is higher than mean score of female secondary school teachers (30.73) .This indicate that male secondary school teachers are having higher Digital Literacy than female.
4. The study found that there exist significant difference in the level of Digital Literacy of urban and rural teachers. The mean score of Digital Literacy of urban secondary school teachers is 31.31 which is higher than mean score of rural secondary school teachers (30.41) .This indicate that urban secondary school teachers are having higher digital literacy than rural.
5. The study indicate that there exists no significant difference in the level of Digital Literacy of aided and government secondary school teachers.
6. The study inferred that the coefficient of correlation for the variable Digital literacy with the variable techno pedagogical attitude in the case of total sample is 0.487. The magnitude and direction of 'r' indicates moderate positive correlation between the variables techno pedagogical attitude and digital literacy.

VIII. EDUCATIONAL IMPLICATIONS:

1. Proper in-service IT training programme should be organized for teachers which may provide sufficient knowledge and skill in IT. Teacher training should be equipped with latest TPACK strategy and opportunities must be provided for hands in experience
2. Schools must strongly implement IT @ school functions by providing IT labs .It create better understanding of Quality Assurance among teachers.
3. We must consider the impact of technology and changing face of curriculum. So introduce need based and advanced concepts in teaching for enabling teachers to develop and use ICT skills in attainment of curriculum learning objectives. Policy makers must give strong attention for making IT Enabled curriculum in the educational system.
4. Instructors must implement blogging technology in their class room to help students articulate and share their learning with peers and experts.
5. Some teachers do not have personal computers to develop their competency in IT. Authorities are to make provisions for teachers who do not have personal computers for developing their techno pedagogical attitude in teaching.
6. Teachers should be encourage to use online and internet facilities for getting access of various knowledge resources and for enhancing professionally which will develop their skills to work on with confidence.

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Abstract: In today's world information is a crucial thing and must be saved or stored correctly for later use. When it comes to information related one's medical records or his/her medical history, this information can come handy even after couple of years where we fail to safely store medical records as they are mostly a hard copy. A digital record of the same will not wear off with time and is also easy to store, maintain and retrieve. The goal of this project is to make a web application where users can store his medical records online and have a full-time access to it. Also, one can easily share his records with his trusted doctor's simply by a unique user record view ID, with or without giving them the permission to edit those records. Having a secure and full time available record, these medical records of a user can be put to greater use by predicting disease that has a chance of affecting the user in future, based on his previous records. User can follow-up this predicted disease with his trusted doctor's and prevent them from happening to them.

IndexTerms - Data mining, Machine Learning, Neural Network, Classification, Decision tree, Dataset, Prediction
ODPHM : Online Disease Prediction and Health Monitor

I. INTRODUCTION

A. Neural Network :

The combination of big data and machine learning is a revolutionary technology that can make a great impact on any industry if used in a proper way. In the field of healthcare, it has great usage in cases like early disease detection, finding signs of early breakouts of epidemics, using clustering.

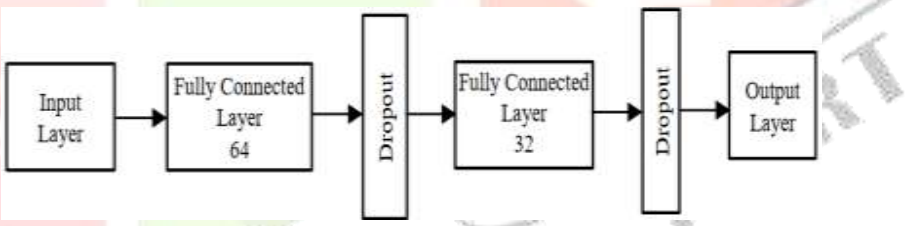

Fig.1 Flow of Neural Network

Neural networks are a set of algorithms, modelled loosely after the human brain, that are designed to recognize patterns. They interpret sensory data through a kind of machine perception, labelling or clustering raw input. The patterns they recognize are numerical, contained in vectors, into which all real-world data, be it images, sound, text or time series, must be translated. Neural networks help us cluster and classify. You can think of them as a clustering and classification layer on top of the data you store and manage. They help to group unlabelled data according to similarities among the example inputs, and they classify data when they have a labelled dataset to train on. (Neural networks can also extract features that are fed to other algorithms for clustering and classification; so you can think of deep neural networks as components of larger machine-learning applications involving algorithms for reinforcement learning, classification and regression.)

Disease involved in prediction system as following

i. Swine Flu
ii. Diabetes

B. Example :

Deep learning maps inputs to outputs. It finds correlations. It is known as a "universal approximates", because it can learn to approximate an unknown function f(x) = y between any input x and any output y, assuming they are related at all (by correlation or causation, for

example). In the process of learning, a neural network finds the right f, or the correct manner of transforming x into y, whether that be f(x) = 3x + 12 or f(x) = 9x - 0.1.

Swine flu is a respiratory disease caused by influenza viruses that infect the respiratory tract of pigs and result in a barking cough, decreased appetite, nasal secretions, and listless behavior; the virus can be transmitted to humans. Diabetes is a number of diseases that involve problems with the hormone insulin. Normally, the pancreas (an organ behind the stomach) releases insulin to help your body store and use the sugar and fat from the food you eat.

C. API :

Tensor Flow is an open source software library for numerical computation using data flow graphs. Tensor Flow is cross-platform. It runs on nearly everything: GPUs and CPUs—including mobile and embedded platforms—and even tensor processing units (TPUs), which are specialized hardware to do tensor math on.[7]

II. LITERATURE SURVEY

A Research paper given by **Mukesh Kumari, Dr Rajan Vohra, Anshul Arora** used Bayesian network with WEKA tool, and used confusion matrix for performance and Dataset collected from Pima Indian dataset [1].

A Research Paper given by **Sudajai Lowanichchai**, **Saisunee Jabjone, Tidanut Puthasimma** Assistant Professor, Informatic Program Faculty of Science and Technology Nakhon Ratchsima Rajabhat University it proposed the application Information technology of knowledge-based DSS for an analysis diabetes of elder using decision tree. The result showed that the RandomTree model has the highest accuracy in the classification is 99.60 percent when compared with the medical diagnosis that the error MAE is 0.004 and RMSE is 0.0447. The NBTree model has lowest accuracy in the classification is 70.60 percent when compared with the medical diagnosis that the error MAE is 0.3327 and RMSE is 0.454 [2].

In another Research paper presented by **Yang Guo, Guohua Bai, Yan Hu School of computing Blekinge Institute of Technology Karlskrona, Sweden**, the discovery of knowledge from medical databases is important in order to make effective medical diagnosis. The dataset used was the Pima Indian diabetes dataset. Pre-processing was used to improve the quality of data. classifier was applied to the modified dataset to construct the Naïve Bayes model. Finally, weka was used to do simulation, and the accuracy the resulting model was 72.3% [3].

In Research paper presented by **Ms. Ankita R. Borkar, Dr. Prashant R. Deshmukh author** used Naïve Bayes Technique based intelligent Prototype with an Accuracy of 63.3% [4]

III. PROPOSED SYSTEM

System design is the process of defining system architecture, modules and interfaces for the proposed system to satisfy specified requirements.

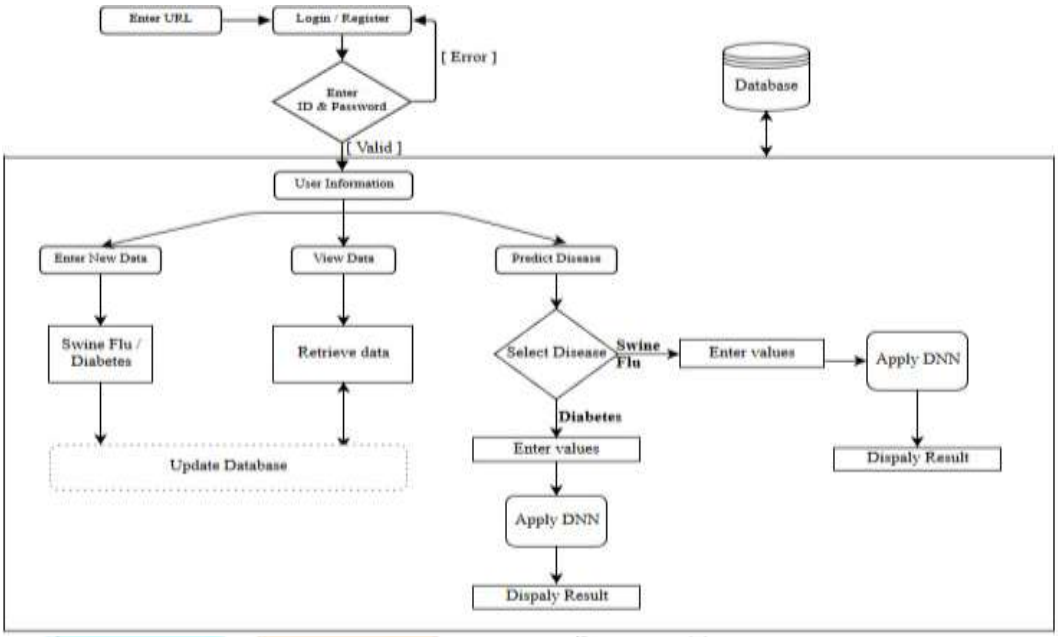

Fig.2. System Architecture of Online Disease Prediction and Health Monitor

In above system overflow, when user enters username and password then user redirected to main page then user can enter own detail and predict disease diabetes and swine flu after selecting values by using sliders and predict disease by using DNN algorithm.

A. Classification:

All classification tasks depend upon labelled datasets; that is, humans must transfer their knowledge to the dataset in order for a neural to learn the correlation between labels and data. This is known as *supervised learning*.

- Detect faces, identify people in images, recognize facial expressions (angry, joyful)
- Identify objects in images (stop signs, pedestrians, lane markers…)
- Recognize gestures in video
- Detect voices, identify speakers, transcribe speech to text, recognize sentiment in voices
- Classify text as spam (in emails), or fraudulent (in insurance claims); recognize sentiment in text (customer feedback)

Any labels that humans can generate, any outcomes you care about and which correlate to data, can be used to train a neural network.[8]

B. Clustering:

Clustering or grouping is the detection of similarities. Deep learning does not require labels to detect similarities. Learning without labels is called *unsupervised learning*. Unlabelled data is the majority of data in the world. One law of machine learning is the more data an algorithm can train on, the more accurate it will be. Therefore, unsupervised learning has the potential to produce highly accurate models.

- Search: Comparing documents, images or sounds to surface similar items.
- Anomaly detection: The flipside of detecting similarities is detecting anomalies, or unusual behaviour. In many cases, unusual behaviour correlates highly with things you want to detect and prevent, such as fraud, disease.[8]

C. Predictive Analysis: Regression

With classification, deep learning is able to establish correlations between, say, pixels in an image and the name of a person. You might call this a static prediction. Similarly, exposed to enough of the right data, deep learning is able to establish correlations between present events and future events. It can run regression between the past and the future. The future event is like the label in a sense. Deep learning does not necessarily care about time, or the fact that something has not happened yet. Given a time series, deep learning may read a string of number and predict the number most likely to occur next.

- Hardware breakdowns (data centres, manufacturing, transport)
- Health breakdowns (strokes, heart attacks based on vital stats and data from wearables)
- Customer churn (predicting the likelihood that a customer will leave, based on web activity and metadata)

The better we can predict, the better we can prevent and pre-empt. As you can see, with neural networks, we are moving towards a world of fewer surprises. Not zero surprises, just marginally fewer. We are also moving toward a world of smarter agents that combine neural networks with other algorithms like reinforcement learning to attain goals.[8]

IV. NEURAL NETWORK ELEMENTS

Deep learning is the name we use for "stacked neural networks"; that is, networks composed of several layers. The layers are made of *nodes*. A node is just a place where computation happens, loosely patterned on a neuron in the human brain, which fires when it encounters sufficient stimuli. A node combines input from the data with a set of coefficients, or weights that either amplify or dampen that input, thereby assigning significance to inputs for the task the algorithm is trying to learn. (For example, which input is most helpful is classifying data without error?) These input-weight products are summed and the sum is passed through a node's so-called activation function, to determine whether and to what extent that signal progresses further through the network to affect the ultimate outcome, say, an act of classification.

STEPS :

Step 1 : Load Data.
Step 2 : Define Model.
Step 3 : Compile Model.
Step 4 : Fit Model.
Step 5 : Evaluate Model.
Step 6 : Tie It All Together.

Here is a diagram of what one node might look like.

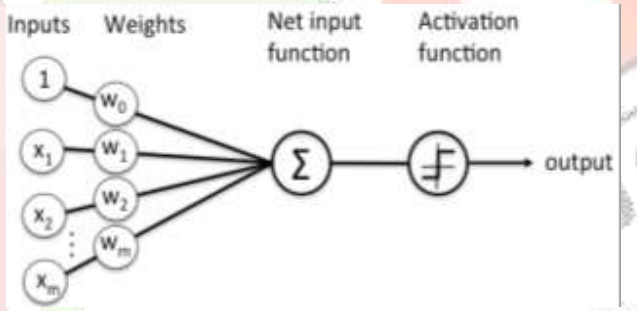

Fig.3 Layers of Neural Network

A node layer is a row of those neuronlike switches that turn on or off as the input is fed through the net. Each layer's output is simultaneously the subsequent layer's input, starting from an initial input layer receiving your data.[8]

Consider a supervised learning problem where we have access to labeled training examples (x(i),y(i))(x(i),y(i)). Neural networks give a way of defining a complex, non-linear form of hypotheses hW,b(x)hW,b(x), with parameters W,bW,b that we can fit to our data.
To describe neural networks, we will begin by describing the simplest possible neural network, one which comprises a single "neuron." We will use the following diagram to denote a single neuron:[6]

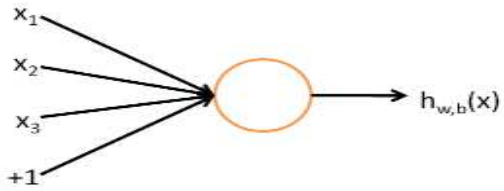

Fig.4 Single Neuron

This "neuron" is a computational unit that takes as input x1,x2,x3x1,x2,x3 (and a +1 intercept term), and output hW,b(x)=f(WTx)=f(∑3i=1Wixi+b) where f:R↦R is called the **activation function**. In these, we will choose f(·) to be the sigmoid function:

$$f(z)=\frac{1}{1+\exp(-z)} \qquad \text{(i)}$$

V. RESULT

Fig.5 Input and Output to Predict Diabetes Disease of ODPHM

Fig.6 Input and Output to Predict Swine Flu Disease of ODPHM

Fig 5 and 6 are the input fields for provided to DIABETES & SWINE FLUE DISEASE PREDICTOR, input are taken from range sliders to restrict input of incorrect data to the program. Fig 5 and 6 are the output of the inserted values for disease prediction and shows whether the person having disease or not with accuracy.

VI. CONCLUSION

In this work a new way to perform health checkup and predicting disease have been presented using the web application. The results have proved the successful completion of the required specification and computed with other algorithm for better accuracy. This application can be used on different browsers such as chrome, Mozilla etc. Multiple users can perform prediction at a time. The system can also be helpful for emergency and productive purpose.

VII. ACKNOWLEDGMENT

Authors would like to thanks to all co-members and guide Prof. Aarti Puthran, Assistant Professor of I.T department, SLRTCE, Thane for their valuable support and help.

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[6] http://ufldl.stanford.edu/tutorial/supervised/MultiLayerNeuralNetworks/

[7] *Tensorflow*: https://www.tensorflow.org/get_started/premade_estimators

[8] https://deeplearning4j.org/neuralnet-overview

A COMPREHENSIVE CONTENT AND LANGUAGE INTEGRATED LEARNING APPROACH TO SKILL FORMATION

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Abstract

Content and Language Integrated Learning(CLIL) is an approach to education, in which language teaching and subject learning are combined with the teaching of school subject in general. CLIL is meant to ensure first that students get knowledge of curricular subject matter and secondly increase their competence in a language other than the normal language of instruction. Content and Language Integrated Learning has become the umbrella term describing both learning another subject such as Science or Humanities through the medium of a foreign language and learning a foreign language by studying a content-based subject. Interdisciplinary teaching helps learners to apply, integrate and transfer knowledge, and fosters critical thinking. Students learn more when they use language skills to explore, write and speak about what they are learning which helps in development of different skills.

This paper provides a description of Content and Language Integrated Learning in the context of language learning to strengthen the language component in subject learning and to focus on the development of cognitive and academic literacies simultaneously mastering their subject skills. The study focuses mainly on three sections. How language is helpful in skill formation, Is language is a tool for higher thought process and language as a medium for curricular transaction for various disciplines. The researchers had conducted study among 200 pre service teachers from various subject background. Data was collected by using focussed group discussion and questionnaire prepared by the researchers and is reviewed by the experts. The results shows that the study have implications on forming the different kinds of skills among the pre service teachers and also effective usage of language in the classroom will be helpful for developing creativity and higher thought process among them. The usage of language can be vary according to the nature of the subject.

Keywords: Content and Language Integrated Learning Approach, Skill Formation, Higher Thought Process, Medium for Curricular Transaction

Introduction

Content and language integrated learning (CLIL) is a generic term and refers to any educational situation in which an additional language and therefore not the most widely used language of the environment is used for the teaching and learning of subjects other than the language itself. (Marsh & Langé 2000). “Content and language integrated learning”

has been introduced recently as a common term for a number of similar approaches to teach content subjects through a foreign language. Many scholars tend to believe that within the CLIL paradigm content subjects are taught in a foreign language only to improve the students' foreign language competence. But this is not the intention of this approach, which is geared towards content learning as much as towards language learning.

CLIL (Content and Language Integrated Learning) 'is a term created in 1994 by David Marsh and Anne Maljers as a methodology similar to language immersion and content-based instruction. It is an approach for learning content through an additional language (foreign or second), thus teaching both the subject and the language. CLIL is a new didactic approach to teaching subjects integrating two features – linguistic and factual. There are two kinds of CLIL: the so-called hard CLIL and soft CLIL methods. Hard CLIL means that the subject or subject curriculum is taught in a foreign language. However, the main lesson objective is the content objective, not the language, while in the so-called soft CLIL form; the content of the subject is subordinate to the language goal. A higher emphasis is put on learning the language. Briefly said, the CLIL method employs the language to pass on the knowledge from a different (usually non-linguistic) subject. CLIL approach involves learning subjects such as history, geography, science, IT etc. through an additional language. Actually it can be very successful in enhancing the learning of language and other subjects and helps to develop various skills as well as it helps to develop cognition

Significance of learning Language and Content

To teach all students according to today's standards, teachers need to understand subject matter deeply and flexibly so that they can help students create useful cognitive maps, relate one idea to another, and address misconceptions. Teachers need to see how ideas connect across fields and to everyday life. This kind of understanding provides a foundation for pedagogical content knowledge that enables teachers to make ideas accessible to others" (Shulman, 1987).The subject matter or content is significant if it is selected and organized for the development of learning activities, skills, processes, and attitude. It also develops the three domains of learning namely the cognitive, affective and psychomotor skills, and considers the cultural aspects of the learners.

In today's era, multilingualism has become more than just 'important'. Knowing a foreign language other than your native language has evolved to be extremely beneficial. Whether viewed from the financial or social aspect, being able to communicate in a foreign language helps to make 'real' connection with people and provides a better understanding of your language. The knowledge of a foreign language enhances your cognitive and analytical abilities. Learning a foreign language is tough and involves a lot of mental exercise. On the individual level, it improves personality and increases your sense of self-worth. The need of language faculties has increased due to the -growing interest in students to learn foreign languages. Learning language prepares students for globalized world and can confidence.

Purpose of the study

Purpose of this study was to examine how language learning and content learning are integrated and how language helps a person in enhancing skills. Language and subject teachers have distinct role in content learning and language learning.

The positive environment and suitable atmosphere helps the learner in academic achievement as well as improvement in language. The study was done by analyzing the responses gathered from two hundred pre service teachers.

Objectives of the study

1. To assess how content learning and language learning are integrated
2. To assess how language helps as tool for higher order thinking
3. To assess how language helps in skill formation
4. To assess how language acts as a media for curricular transaction

Methodology

The paper proposes to find out the integration of content and language in skill formation and higher order thinking process. Data was collected by using focused group discussion and questionnaire prepared by the researchers and is reviewed by the experts. Questionnaire was framed and administered it among two hundred pre service teachers from various subject backgrounds and had a focused group discussion among the student teachers.

The findings

- 98% of the pre service teachers are of the opinion that language learning and content learning are integrated. Content learning is possible only through effective use of language and by learning content they can improve their language also.
- 95% of the student teachers are of the opinion that language enhance one's skills in different areas such as communication, life skill, interaction, reasoning scientific skills etc.
- Language is a media for communication. Language helps us to communicate and express. Effectiveness of curriculum transaction only be depends upon the effective and appropriate language
- Language acts as a cognitive tool. Language serves as a cognitive tool kit that allows us to represent and reason in ways that would be impossible without such a symbol system.
- Subject like social science, science, mathematics etc. helps the learners to develop critical thinking abilities, sense of social competence and problem solving skills

Pedagogical implications

1. Language as an instrument in thought process: - It is hard to imagine a teacher or school leader who is not aware of the importance of teaching higher-order thinking skills to prepare young men and women to live in the 21st Century. The goal of teaching is then to equip students to be wise by guiding them towards how to make sound decisions and exercise reasoned judgment. The skills students need to be taught to do this include: the ability to judge the credibility of a source; identify assumptions, generalisation and bias; identify connotation in language

use; understand the purpose of a written or spoken text; identify the audience; and to make critical judgments about the relative effectiveness of various strategies used to meet the purpose of the text.

2. Language as a tool for formation of skills: effective use of language helps to develop different skills such as skills of describing, synthesizing, analyzing and evaluating, learning to learn and communication at the expense of related knowledge can lead to context-free activities driven by a perceived imperative for practical and active methods, rather than a considered view of the links between knowledge and skills.
3. Language as a media for curricular transaction: language acts as a media for the transaction of curricular content. A teacher can adopt the methods and strategies like
    - ❖ Discussions
    - ❖ Seminar
    - ❖ Debate
    - ❖ Symposium
    - ❖ Conference
    - ❖ Brainstorming
    - ❖ Language of explanation or Skill of Explaining
    - ❖ Language of questioning
    - ❖ Language of reinforcing
4. Language and content are integrated:-both content and language are integrated since language teachers and subject teachers collaboratively work together.

Role of teachers

It is vital to provide collaboration and cooperation between subject teachers and language teachers. Subject teachers often expect certain competences to be already acquired through first language and second language teaching and therefore readily available in subject-specific learning contexts, without additional training or reflection about their meaning and use in these new contexts. Teachers need continuous attention, systematic treatment and goal-oriented practice, without which the language, and also the content level of competence, remains simple, underdeveloped or even deteriorates over time. It is important for English teachers and content subject teachers to each know what the other is doing. For instance, the English teacher can teach students how to do a vocabulary log. The content subject teachers then ask students to keep a vocabulary log for their own subject. The English teacher can collect the vocabulary logs and check from time to time to make sure that students are on the right track. As every subject has to contribute to the language development of students, a balance between an emphasis on English and an emphasis on content is recommended. Since more time and effort has to be spent on the development of students' language proficiency, the subject content may have to be reduced, especially at the initial stages.

Conclusion

Language cannot be effectively learnt without a context while learning in all subjects is dependent upon language. In view of the above, language and content are closely interrelated. In fact, content subjects provide a context for language while effective language development facilitates the learning of content subjects. It is therefore necessary to integrate language and content

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NOBODY IS TOO BIG TO FAIL

Priya Kala[1]

Abstract

Healthy economy of a country is very essential not only for the country itself, but also for the global development as well. In today's globalized world, economy of a country does matters at the global level. Market of digital economy or mobilized economy is not restricted to one country only. It is necessary that the economy of a country should be based on strong basis of corporate world. Therefore, the emphasis has been always levied upon the corporate governance of the company.

Fall down of economy during 2007 to 2011 was an example for the global economy that the corporate giants could never fail or fall has been proved as a niche. Although the global financial crisis did not affected much to India but it affected the least developed countries. The reason behind the financial crisis in US and India, was the emphasis of the companies on the long term plans rather than short and easily achievable goals and lack of good corporate governance. Although, there is no surety that the plan or strategy to face any economical or financial crisis will be successful. As the companies cannot predict certain future hurdles or crisis. While observing the after effects of the financial crisis, it was explicit that there was lack of governance in companies which faced major crisis. Financial crisis is a nightmare for any investor or company. There are many factors including corporate governance, market focus of a company, marketing design, etc. which can be consequential to market fall. Financial crisis of 2007-2011 was major consequence of failure of big market players. When a giant company fails to perform efficiently, it also affects the trust of investors as well as it also breaks the faith and confidence of other market players.

During the financial crisis, it is the duty of government to revive the market and economy by effective measures. It is difficult for any government to face this phase of crisis because along with the immediate consequences, there are also certain after effects of the economic crisis which takes long time to be rectified. Government also have to revive the small businesses as well the big market players.

In this paper, the research would analyse the reasons behind the financial crisis occurred during the year 2007 to 2011 along with a brief dissection of past crisis and the principles which has to be followed by the corporations in order to avoid major effects of the fall of economy. As government also plays a crucial role in reviving the economy, its role and measures taken by the government will also be analysed. Till now, there is no perfect solution for avoiding the financial crisis or to save the economy from the crisis as each country is having their

[1] Priya Kala, Teaching and Research Associate (Law) at Gujarat National Law University, Gandhinagar.

own market tendencies along with global perspective. Feasible solutions, from the researcher's point of view, will also be given in the paper.

Keywords: Globalized world, corporate giants, financial crisis

1. Introduction

Today's world seems more remote or 'globalised' compared to old days, when the securities market of India was in its infant stage. Native Share and Stock Brokers' Association, which was established way-back in 1887, was a corner stone for the Indian securities market.[2] This association also put forth the concept of public interest as well as members' interest.[3] From the old days of frequent meetings of the Committee of Management, to cop up with the frequent changes in the economical as well as political incidences happened, which includes Civil War of 1861.[4] It is interesting to note that with the Report of the Bombay Stock Exchange Committee only, the name of Bombay Stock Exchange was first conceptualised. The situation of Securities market of India is much digitalized and more transparent and accountable at the current scenario compared to its initial stage. This fact can be analysed through the committee report[5] itself. The report[6] shows many management aspects of the securities market at the initial stage, which were prime concern of the stakeholders during the time when foreigners controlled Indian economy. Although, the main concern was the lacuna of proper framework for regulation of scrips. Keeping in mind this concern, one can imagine the situation when a country's economy, without proper framework, could lead to a disaster.

The main fundamental benefit of the securities market is to give everyone his or her share in the profit and to encourage a healthy market economy. This image of a healthy economy stands on three pillars: transparency, accountability and anonymity. The important question here is that whose responsibility is it to maintain these three pillars? The answer can be different from an investor's point of view, from a start-up's point of view, from a share broker's point of view and from a lender's point of view. The author will make an endeavour to find an appropriate answer to this question through study of financial crisis in United States and its parallel effects in India.

2. Financial Crisis as a threat

[2] Report of the Bombay Stock Exchange Committee, (1924), Available at: <https://www.sebi.gov.in/History/HistoryReport1924.pdf> Accessed on: 7/2/2018
[3] ibid
[4] ibid
[5] ibid
[6] ibid

The worst dream for any country could be is a financial crisis of which, effects could be long term and unavoidable. The UK and US economy is always having threat of bubble economy which can adversely affect the country at the worst level. The election of President Donald Trump has led to many economic and political changes in US.[7] The economists are having fear that the market would crash at any time, looking at the current perception of Mr. Donald Trump. However, the time will show that how far this prediction is true.

If we look at the fact or from the practical point of view, any country's economy is always having the hanging sword of market crash at any time. Looking to the Indian securities market, the threat of market crash was felt very close in the last year when the bubble of IPOs were running the market at insane numbers. Nevertheless, if we look at the current scenario, the stock market is at its highest peak in the history of securities market. The possible reason behind this increase is the flow of money from investment by some leading corporations and foreign institutions as well. Increasing number of investments also shows the increasing trust of public in the companies. It depends on the company that how far it can retain the trust of the public.

If we look at the past incidents, India was not much developed and its economy was strong enough to handle the inflow of foreign money and to regulate its own market. Therefore, India tried to be on the safe side by not keeping the eyes on the foreign money. However, technology and other aspects has made the world closer to each other. Changing political views of the countries also affects it economy, either positively or negatively. However, that does not mean that the history can never be repeated, with the help of proper framework only. This point can be elaborated more with a brief insight into the history of financial crisis at US and India.

Financial crisis does not affect only the economy of the country during a certain period, but it is having a long-term effect, which can be felt in the future transactions and market as well. The duration of that 'certain period' depends on the core strength of the market as a whole, at the national, state and the company it self's levels. Here, the meaning of core strength is depending upon cash and equities as well as short-term investments.

3. US and Indian Financial Crisis since 1929

US economy is always considered as one of the strongest economy of the country for facing the financial crisis. However, if we look into the history of financial crisis in US, it can be understood that the US economy has always learned from its experiences. The concept of 'Too big to fail' can be seen in the corporate giants. They consider themselves as above the effects of the financial crisis as they believe in their own market strategies and values. However, history has witnessed that the corporate giants can also, become a victim of the crisis, if it is not active or cautious about its own strategies.

India, as a developing country, is not having a strong economy to bear the costs of a big market crash. However, it is getting stronger by the liberal approach of the government to open the market for the foreign investors.

[7] 'Do You Think Donald Trump Is Ready for a Real Financial Crisis?', The New York Times, 6 February, 2018, Editorial Board

Nevertheless, in today's globalising world, it is explicit that the more the world becomes smaller, the more risk sharing will be there in the market as well. Effects of the financial crisis can be felt at each part of the world, at major or minor level.

It is impossible for any country to keep its market restricted to its domestic investors only. Moreover, as discussed above, the open market invites more chances of market crash. If we look at the market regulation from the legal framework perspective, it is impossible to control the market with changes at every fraction of moment. In addition, another point of the discussion is that whether always, improper legal framework or implementation of law has been the sole reason behind the financial crisis. For reliable answer of this question, one has to look into the history of the financial crisis.

(1) US Financial Crisis:

i. The Great Depression of 1929:

Throughout the 1920s, the U.S. economy expanded rapidly, and the nation's total wealth more than doubled between 1920 and 1929, a period dubbed "the Roaring Twenties."[8] The main reason behind the peak of the securities market was the huge amount of investment in the securities market. From the rich to middle class people were attracted towards the securities market. And those who were not conversant with the securities market had their faith in banks, who were offering high interest rates. From the period, when the great depression started, people were afraid that their money would never paid back by the banks. Moreover, banks had already utilised the money in the securities market. With the fall of the securities market, their money was also vanished. As a result, banks were unable to repay the money. This made the situations worse than expected.

> *"The Great Depression lasted from 1929 to 1939, and was the worst economic downturn in the history of the industrialized world. It began after the stock market crash of October 1929, which sent Wall Street into a panic and wiped out millions of investors. Over the next several years, consumer spending and investment dropped, causing steep declines in industrial output and employment as failing companies laid off workers. By 1933, when the Great Depression reached its lowest point, some 15 million Americans were unemployed and nearly half the country's banks had failed."*[9]

The consequences of the market crash were too worse that people started losing faith in the economy of the country. There was a time when farmers left their fields unharvested and some people, in the other side of the city, were unable to get the necessary food supply.[10]

> *"By its height in 1933, unemployment had risen from 3 percent to 25 percent of the nation's workforce. Wages for those who still had jobs fell 42 percent. Gross domestic product was cut in half, from $103 billion to $55 billion.*

[8] 'GREAT DEPRESSION', History.com Staff, 2009, History.com, Available at: http://www.history.com/topics/great-depression, Accessed on: 20th February, 2018
[9] ibid note 7
[10] ibid note 7

That was partly because of deflation. Prices fell 10 percent each year. Panicked government leaders passed the Smoot-Hawley tariff to protect domestic industries and jobs. As a result, world trade plummeted 65 percent as measured in U.S. dollars. It fell 25 percent in the total number of units."[11]

All these facts clearly depicts the picture of the US economy during the market crash. The damages caused by the market crash took 10 years to the US economy to streamlining the market and redeem public faith.

The major possible causes behind this market crash were the improper legal framework for regulation of the banks, lack of awareness among the people, and the lack of corporate governance among the banks.

ii. 1970s Stagflation

This time, the US economy faced consequences of the lack of foresee of economists of the country.

"...1970s: it began with a huge rise in oil prices, but then continued as central banks used excessively stimulative monetary policy to counteract the resulting recession, causing a runaway wage-price spiral."[12]

This time, the US economy faced the crisis due to wrong belief in its economic situation. It is important to note here that the economic theory, which was developed and failed during this period, was hard learning experience for the US economy.

iii. 1989 Savings and Loan Crisis

The US market was operating with the help of newly introduced digital mechanisms during that period of 1989. This digitalisation helped investors to invest and traders to trade in huge amount of securities. It was for the first time, that the market also witnessed its negative consequences. Big corporate entities were also shocked with the dropping market movement.

"Monday October 19, 1987, is known as Black Monday. On that day, stockbrokers in New York, London, Hong Kong, Berlin, Tokyo and just about any other city with an exchange stared at the figures running across their displays with a growing sense of dread. A financial strut had buckled and the strain brought world markets tumbling down."[13]

[11] 'The Great Depression: What Happened, What Caused It, How It Ended', Kimberly Amadeo, 2017, the balance.com, Available at: https://www.thebalance.com/the-great-depression-of-1929-3306033, Accessed on 20th February 2018.
[12] 'Stagflation and the 1970s Oil Crisis', Transmissions, Banksters & Economy, History, 2012, transmissionsmedia.com, Available at: http://transmissionsmedia.com/stagflation-and-the-1970s-oil-crisis/, Accessed on 20th February 2018.
[13] 'What caused Black Monday, the stock market crash of 1987?', Investopedia, investopedia.com, 2018, Available at: https://www.investopedia.com/ask/answers/042115/what-caused-black-monday-stock-market-crash-1987.asp, Accessed on 20th February 2018.

This 'Black Monday' is remembered in the US market history for the reason that how one news can crash the market without any prediction, in the digital age.

iv. 2008 Financial Crisis

This financial crisis is one of the most studied crashes of the history, as it affected not only the US economy, but other economies as well. Moreover, this time, corporate giants also could not sustained because of the lack of corporate governance. It was also best example of the global economy that we discussed in the earlier chapter. The issue of lack of corporate governance was not new to these giants and mid-cap companies but their belief of 'too big to fail' resulted into their worst dream of market crash.

> *"Each in its own way, economies abroad marched to the American drummer. By the end of the year, Germany, Japan, and China were locked in recession, as were many smaller countries. Many in Europe paid the price for having dabbled in American real estate securities. Japan and China largely avoided that pitfall, but their export-oriented manufacturers suffered as recessions in their major markets—the U.S. and Europe—cut deep into demand for their products. Less-developed countries likewise lost markets abroad, and their foreign investment, on which they had depended for growth capital, withered. With none of the biggest economies prospering, there was no obvious engine to pull the world out of its recession, and both government and private economists predicted a rough recovery."*[14]

Above-mentioned lines perfectly depicts the picture of the global financial crisis of 2008. The starting point of this crisis was bankruptcy of the Countrywide Financial Corp.[15] This Company was considered as the largest mortgage lender of US. The next consequential fall was of another corporate giant viz, Bear Sterns. The next shock for the market was the fall of share prices of Lehman Brothers and Merrill Lynch, two strongest investment banks of the Wall Street. Next on the markets' hit list was American International Group (AIG), the country's biggest insurer, which faced huge losses on credit default swaps.[16]

The situation of total disturbance in the market can be understood with the only fact that two major banks of the country declared themselves as bankrupt and subsequent continuous fall of major traders of the Wall Street.

> *"Five days later saw the end for the big independent investment banks. Goldman Sachs and Morgan Stanley were the only two left standing, and their big investors, worried that they might be the markets' next targets, began moving*

[14]' The Financial Crisis of 2008', Joel Havemann, Encyclopaedia Britannica, Britannica.com, Available at: https://www.britannica.com/topic/Financial-Crisis-of-2008-The-1484264, Accessed on 20th February 2018.
[15] ibid
[16] ibid note 13

their billions to safer havens. Rather than proclaim their innocence all the way to bankruptcy court, the two investment banks chose to transform themselves into ordinary bank holding companies. That put them under the respected regulatory umbrella of the Fed and gave them access to the Fed's various kinds of credit for the institutions that it regulates."[17]

Effects of this financial crisis was felt more in the developed countries and developing countries, as their export-import businesses were majorly affected by the market crash. The point to focus here is that, the corporate giants were successful in making the profit from the targeted buyers but the lack of corporate governance, to overcome the situation of demand and stock, lead towards the market crash.

(2) Indian Financial Crisis

i. 1992 Crisis (Harshad Mehta Scam)

This year has been remembered in the history of Indian securities market as the dark period because many dreams and hopes of having the healthy market and economy as a whole, was turned out to be a scam and thousands of people, who started fulfilling their dreams and getting profit of the value they had never imagined. The market crash vanished millions of small investors and start-ups. It also took a long period for the economy to bear the first shock by the domestic investor.

This market crash also reinstated the fact that the lack of proper governance could lead to major disaster and it was a learning lesson for the small ventures. It was also a signal for need of a transparent and trust based market.

4. Efforts by United Nations for effective Corporate Governance of the Companies:

As discussed earlier, it is impossible for any country to stay away from the competitive economy and to accept the threat of financial crisis. Therefore, as a hope to the investors, traders, companies and the market as a whole, to maintain the standards of the securities market, an initiative has been started by the United Nations in the year 2004.

In the modern digital era, it is always preferred to have a balanced unitisation of the resources for the sake of its preservation for the future generation and optimum utilisation of other resources as well. This idea can be termed as 'Sustainability'. In the same way, the United Nations has started the initiative of the 'Sustainable Stok Exchange', with an aim to provide an effective platform for peer-to-peer dialogue among global exchanges. It

[17] ibid note 13

also explores the ways in which stock exchanges can work together. It also tries to provide corporate transparency and performance in respect to the environmental, social and corporate governance (ESG) issues.

It is interesting to note that, this initiative focuses on the major issues, which led to financial crisis, as discussed above, with the major focus on the overall development of the countries without affecting their own economy. However, the issue of its adherence is still there which can be resolved only by assessment of the experience of all the countries.

> *"The SSE initiative continues to invite exchanges globally to become a Partner Exchange of the SSE by making a voluntary public commitment to promote improved ESG disclosure and performance among listed companies. It works with all of its Partner Exchanges through dialogue, capacity building and research to continue the momentum and to promote sustainable and transparent capital markets worldwide."*[18]

There are many other initiatives such Climate Disclosure Standards Board (CDSB) and ESG Reporting, which can help the companies to achieve their goals of corporate governance.

5. Conclusion

Corporate governance is more than just a shield for a company to achieve success in market. In present globalising world of competitiveness and disclosure-based regime, it is important for a company to survive in the market as well as to earn and retain the trust of the investors with the aim of profit. Corporate governance could be considered as one of the corner stones of the company to stand and defend the effects of the financial crisis. Market crash just makes the picture clear that where the improvement is required and then the company has to take a lesson from that and to stand again, as a warrior.

[18] About the Sustainable Stock Exchanges (SSE) initiative, Sustainable Stock Exchanges initiative, Available at: http://www.sseinitiative.org/about/

GRID MODERNIZATION FOR BIG DATA USING PHASOR MEASUREMENT UNIT

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Abstract: Smart grids are forever huge in size and complicated in topology; big data analytics and data-driven approach become natural solutions for the long run grid. Driven by information analysis in high-dimension, big data technology works out information correlations indicated by applied mathematics parameters to achieve insight to the inherent mechanisms. Actually, big data technology has already been with success applied as a robust data-driven tool for various phenomena, like quantum systems, monetary systems, and biological systems in wireless communication networks. For good grids, information-driven approach and data utilization are current stressing topics, as proven within the special issue of big data Analytics for Grid Modernization. This paper provides unique methodology for modeling the spatio-temporal (Phasor measure Units) PMU information. It illustrates the structure of the spatio-temporal PMU information.

Keywords: Smart grid, Big Data, PMU and Grid Modernization, big data Analytics.

I. INTRODUCTION

Big information is that the term for any assortment of enormous and complicated information that becomes troublesome to method victimization ancient processing applications. The challenges embody analysis, curation, capture, sharing, storage, visual image, search, transfer, and privacy violations. Recent times have witnessed the generation and storage of enormous quantity of important information by varied industries that is chop-chop increasing on the net and therefore the info scientists face lots of challenges for maintaining a large quantity of information because the quick growing industries need the numerous information for enhancing the business and for prophetical analysis of the data. Huge Data may be a term containing the appliance of techniques and strategies to capture, process, analyze and visualize doubtless massive datasets during an affordable timeframe not accessible to straightforward IT technologies. By default, the platform, tools and software package used for this purpose are conjointly referred to as ―Big information technologies. The thought of ―database machine came out of the mind, within the late 1970's that may be a technology specially used for storing and analyzing information [1]. The storage and process capability of one mainframe system became inadequate because the information volume magnified. To fulfill the demand of the increasing information volume, individuals projected ―share nothing that was a parallel information system. This "share nothing" system model relies on the technique which made the use of cluster and an undeniable fact that each machine has its own processor, storage, and disk. The primary no-hit industrial parallel information system was Teradata system. Such information became very talked-about recently. In 1986 On June 2, Teradata given the primary parallel information system with the storage capacity of 1TB to Kmart to assist the large-scale retail company in North America. So that it can expand its information warehouse that was a milestone event within the history of information analysis techniques. Within the late Nineteen Nineties, the advantage of parallel information was well known within the field of information analysis [2]. The present buzz around big data is sort of insulating material in timeline compared to the beginning of the story of however information became huge. .It leads to the initial tries to quantify the expansion rate in the volume of information or which is popularly known as the information explosion. To confirm the ability quality and reliable within the future power networks timely and reliable grid measure information plays a crucial role [3]. Over the years, thousands of power quality and good meters are put in numerous points of the grid and also the range is merely increasing. As a result, the collected information volume, from of these menstruation devices, is growing ceaselessly. However, not all the info is kept one amongst the explanations for this can be that there's a scarcity of strategies to research the information and extract the complete information. The collected information as an example contains helpful info regarding the performance of the ability system beside info regarding underlying causes of events. In the meantime such information includes many complexities that create information analytics and knowledge extracting troublesome [4]. Creating sense of such information and recognizing special patterns within the information is crucial for network operators and different stakeholders within the good grid to create higher selections [5]. It's expected that the continual watching of the many points and police investigation such patterns provide info a couple of vary of problems with interest to the grid operator. For this purpose a unique methodology for modeling the spatio-temporal PMU information were used. It gives the abstract illustration of the structure of the spatio-temporal PMU information.

II. LITERATURE REVIEW

El Khaouat [6] analyzes the data and communication technologies have vital role with numerous researches up obtainable electrical grid. The appearance of the Internet of things, and also the growing dexterity of associated devices like good meters and different sensor. We get huge quantity of information concerning energy expenditure, energy manufacture and then on. During this background, superior grid data management and analytics persecution big data tools assist to manage this massive volume of together information from good devices put in inside the grid so as to remove information, outline key presentation indicators, forecast command response performance. This paper aims at nearby an answer for administration big data for good grid to generate it on the marketplace for prime level submission. It's a design with detail of its every constituent and explanation information flow and scrutiny victimization enormous data method.

Zhu, Liehuang [7] read the increasing range of utility firms is establishment to use cellular wireless networks to broadcast information within the good grid. As a result, immeasurable users' daily energy expenditure information is sent by wireless good meters. Though, the printed relocate manner of wireless communication creates it perceptibly at risk of cyber harass. Since good gauge readings will simply be escape, users' energy prototype might be conditional. Hence, users' privacy welcome is below serious danger. This text begins by commence the present work on burglary information from wireless communication networks. Then 3 assortments of huge data dispensation schemes for investigate pinch information are diagrammatical. Finally, we argue many protection ways that are in development within the era of the wireless superior grid.

Refaat, Shady S., [8] sensible grids systems produce an outsized measure of information. Big data is an important constituent for up the dependableness, steadiness, and effectiveness, and in waning the value of power use. Reliable practice of sensible grid depends on the service of varied period info connected with scrutiny, communications, and management systems. This manuscript offers a typical considerate of however huge information will impact the dependableness and steadiness of installation, and examine well a reasonable grid communication spec. Moreover paper explores and assembles the reasonable energy system, the sensible info system, and also the reasonable communication system. This paper makes available deep approaching into the dependableness confront and effectual solutions toward dependableness harms in reasonable grid to reveal the enormous knowledge role right through the changeover, and the way it will fuel the unrefined growth of reasonable grid.

Vimalkumar, K [9] Technological progression permits the condition of web anywhere. The ability commerce isn't AN exception within the technical development that constructs everything smarter. Sensible grid is that the superior description of the normal lattice, that makes the system supplementary inexpensive and self-healing. Synchro phasor could be a machine utilized in levelheaded grids to exist the values of electrical influence, voltages and existing. The phasor measure unit manufactures huge volume of present and voltage information that's wont to watch and organization the presentation of the grid. This information is vast in dimension and liable to assault. Intrusion Detection could be a common method for locating the intrusions within the system. During this paper, a huge knowledge framework is planned victimization diverse machine knowledge techniques, and intrusions are perceived supported the classifications on the synchro phasor dataset. Throughout this approach varied machine learning method like profound neural networks, support vector machines, random forest, call trees and naive Bayes classifications are in serious problem the synchro phasor dataset and also the consequences are compared persecution metrics of correctness, recall, bogus rate, specificity, and forecast time. Feature choice and spatiality reduction algorithms are wont to cut back the forecast time taken by the designed approach. This paper uses apache glimmer as a platform that is suitable for the accomplishment of Intrusion Detection system in sensible grids persecution enormous knowledge analytics.

III PROBLEM DEFINITION

Big knowledge analytics and data-driven approach become natural solutions for the long run grid. Actually, huge knowledge technology has already been with success applied as a robust data-driven tool for various phenomena, like quantum systems, monetary systems, and biological systems similarly as wireless communication networks [10]. For sensible grids, knowledge-driven approach and data utilization are current stressing topics, as proven within the special issue of huge knowledge Analytics for Grid Modernization. They were face many issues like power problem during the data transmission, however the device may disconnected due to problems in devices and in electrical circuits. So the transfer of data may loss. Huge knowledge is that the strategy of examine big data sets containing reasonably data varieties while transferring it provides big issues in grid.

IV. PROPOSED METHOD

Big knowledge Analysts would really like another tools and techniques for this purpose. Thus typically this can be often very hard task for big data Analysts to touch upon tools and techniques. Huge knowledge is that the strategy of examine big data sets containing reasonably data varieties. Sensible meters are substitution existing electricity meters which offer energy consumption knowledge to the energy suppliers mechanically with higher time resolution. Phasor measure Units (PMUs) are usually applied, at transmission level [11], that facilitate system operator to become alert to matters of whole system, by measurement in many alternative locations of

the system. Since power quality could be an essential facet of the dependableness as perceived by the top user, an outsized variety of power quality watching devices has been put in numerous locations within the sensible grid. Additionally to those electrical sources of data are alternative sorts of data within the sensible grid like follow:

• Data from management, management and maintenance of instrumentation within the power generation, devices, transmission and distribution components of the grid.

• Data from in operation utilities, like giant knowledge sets that aren't directly obtained through measurements within the network.

A. Data Preprocessing

For effective knowledge analysis, sensible and higher quality of information ought to be served as an input. The collected journal knowledge consists of ton of inapplicable and inconsistent knowledge and desires to be cleansed for effective mining. Following steps are followed for knowledge pre-processing

1. Tokenization: This step breaks a stream of text up into phrases, words, symbols, or alternative significant components known as tokens. The results of the tokenization to be a sequence of tokens, and its main use is that the credentials of significant keywords.

2. Stop word elimination: the foremost common words that are unlikely to assist text mining like prepositions, articles, and pro-nouns are thought of as stop words. This step eliminates these words from the text as a result of they're not helpful for the text mining applications. Thus, the sequence of tokens is reduced and it helps to enhance the system performance.

3. Stemming or lemmatization: This step reduces the words into their stems (also called base or root). Since the means completely different words may be a similar however their kind different, it's necessary to spot every word victimization its stem from [12]. Here more than a few stemming algorithms which might do that.

B. Data Integration and Validation

To handle huge knowledge, initial of all, the economical transformations and reformulations ought to be created for dynamic integration of heterogeneous information sources. The accuracy and reliability of integrated and recorded knowledge is indicated by an absence of any alteration in knowledge between 2 updates of an information record. A key task related to huge knowledge Analytics is info retrieval. Previous ways and solutions for info storage and retrieval are challenged by the quantity and selection complexities of huge knowledge. Info retrieval desires linguistics knowledge instead of bit strings [13]. Therefore, the info the information is organized within the manner that represents relationships between the assorted data components. Such linguistics knowledge may be understood meaningfully while not human intervention and it ends up in quicker and precise info retrieval. Linguistics knowledge compartmentalization may also avoid duplication and repetition of information.

C. Data Extraction

However, the relevancy of the various terms within the framework of all the news ought to even be taken under consideration. For this reason, it's necessary to prune the generated terms supported their frequencies of incidence throughout the gathering. The aim of this term filtering method is to spot those terms that aren't of interest within the context of the whole news corpus. Thus, we want to get rid of not solely the terms that don't occur oft enough however additionally those that occur in a very fairly constant distribution among the info assortment. Knowledge collected from the wide applied phasor measure unit and knowledge modeling victimization linear and nonlinear combination of random matrices.

Implementation of the proposed model

1): Off-line training period (System-dependent parameters learning):
1a): collect the PMU data and represent them using (4);
1b): calculate the test statistic of the data flow using (10);
1c): calculate mean and variance of the proposed test statistic;
1d): determine the event indicator threshold γ using (14);
2): Online power state indicating:
2a): acquire the test data flow: $\mathbf{Z}_{j1}, \cdots, \mathbf{Z}_{jq}, j = 1, 2, \cdots, c$;
2b): calculate the test statistic of the data flow using (10);
2c): determine whether there is an event using (14);
if no event detected:
add the test data flow into history data;
go back to the step 1a);
else:
go to step 2d);
2d): Determine the relative magnitude, duration and location of the system event using (10), (15) and (18), respectively;
3): Performance evaluation:
3a): FAR (12) and DR (13) analysis;
3b): the effect of measurement noise analysis;
3c): the effect of parameter q analysis.

Algorithm 1: Proposed Method

At present, several utilities have additionally deployed synchronic phasor measure units (PMUs) on extraction systems to produce the period watching of voltage stability. Several measurement-based VSA approaches approximate the external system by estimating parameters of a venin equivalent circuit [14, 15]. They have confidence period synchronic phasor knowledge from PMUs placed on the boundary of a load space. Some representative issues arisen from wide readying of synchronous phasor measure units that capture varied options of interest in sensible grids. It shows random matrix theories won't characterize the info collected from synchronous phasor measure and tackle the issues within the era of "Big Data".

V. EXPERIMENTAL RESULT

It is here worthy to note that in an exceedingly strict sense, free likelihood applies to infinite-dimensional random matrices. The convergence rate of the empirical spectral distribution to the straight line limits may be a operate of 1=N; wherever N the node of the ability grid in thought. For N = 118; the accuracy is already enough to our sensible issues. Finally, our study is conducted within the settings of enormous facility.

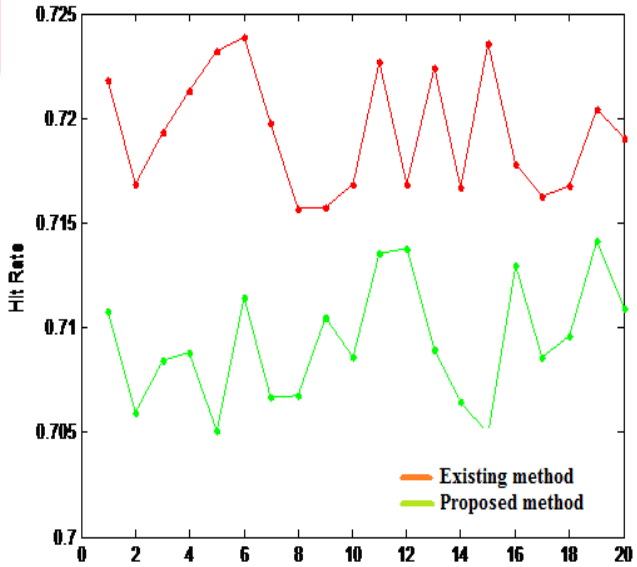

Figure1: Comparison for smart grid

Supported the spirit of our unified framework of victimization massive random matrices in wireless network, sensing and good grid, we will explore settings for alternative fields. After all, the muse of big data science is firmly engineered on massive random matrices. Since every term is calculated by a matrix operation and a number of other convolutions, the computation times hit rate in the main rely upon the numbers of terms needed to satisfy.

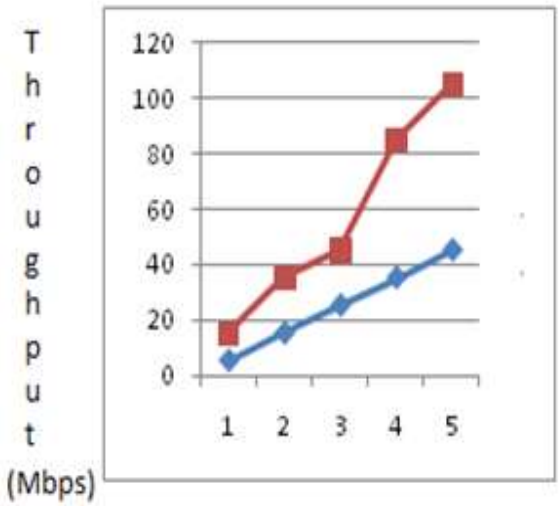

Figure 2: Throughput analyzing

Less error tolerance implies additional terms within the series to approximate the P-V curve. Much, the most range of terms is within the vary of 40-60 since the float purpose exactitude is exhausted. The sturdy power state analysis victimization individual window-truncated PMU knowledge. Instead of exploiting individual window-truncated PMU knowledge, this work tries to point state analysis by high-dimensional applied math properties of overall PMU knowledge.

VI. CONCLUSION

In this paper, we represent large streaming PMU knowledge as big random matrix flow. By exploiting the variations within the variance matrix of the huge streaming PMU knowledge, a unique power state analysis algorithmic program is then developed supported the multiple high dimensional variance matrix tests. The projected check data point is versatile and statistic, that assumes no specific parameter distribution or dimension structure for the PMU knowledge. Rather than observance the raw PMU knowledge, recently, there has been significant interest within the statistics of PMU measurements. This can cause victorious extraction of data from massive data.

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Online Shopping - Growing trend against Conventional Shopping

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ABSTRACT:

Internet shopping has been widely accepted as a way of purchasing products and services. It has become a more popular means in the Internet world. It also provides consumer more information and choices to compare product and price, more choice, convenience, easier to find anything online.
Online shopping has been shown to provide more satisfaction to modern consumers seeking convenience and speed. online shopping today has reached about four times the size of the traditional shopping for certain goods and services.
Key words: online shopping , Traditional shopping , convenience , satisfaction.

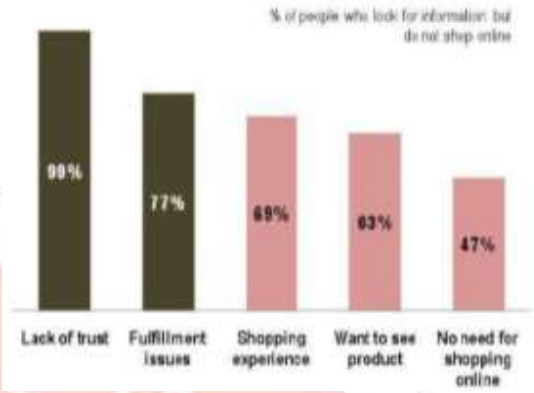
INTRODUCTION:

E-Commerce platforms are different from conventional physical stores in many ways. With continuous advancements in technology, it is becoming easier and easier for people to buy any product just with a click. In comparison to that what is offered at physical stores, online stores would offer a number of advantages:

Online shopping is much more convenient and time saving. There is no hassle of traveling and waiting lines. With ease of access and availability of 24X7; online shopping is available anytime and anywhere. These stores provide consumers with free and rich information about products and services.

LITERATURE REVIEW

Today there are many tools and review options that help consumers, compare and make decisions easier among various products and services.



Source: www.stannsannquest.com

Hoffman and Novak (1996) indicated that the key distinguishing feature between traditional mass media and marketing communication on the Internet is interactivity. There are lots of definitions of e-commerce, and they all are not very far from each other.

Mostaghel (2006) concluded that through means of telecom network, ecommerce is all about the sharing business information, maintaining business relationships, and transacting.

Same as that, according to Tian and Stewart (2007), Ecommerce represents not only the business of goods and services, but also keeping buyers, building relationships with customers and other companies to establish new business horizons with them.

Dating back to 40 years, every business has been divided into two types: Business-to-Business (B2B) and Business-to-Consumer (B2C).

Identified by Gröblinghoff (2002) Business to Business e-commerce is an electronic system through which companies can conduct transactions and also share information. Additionally, information is shared before & after the transaction with the customers. Ecommerce also offers number of applications for creating and achieving easier connections with distributors, resellers, suppliers and etc.

Grewal et al (2002), stated that online shopping is much more efficient in meeting the consumers' needs and wants. This method of shopping is an easy way out for customers when it comes to access information about the brand's product quality, availability, product specifications and prices, along with comparing all this with those of another brand with the help of online shopping.

Brown et al., (2003) in his study instigated an outcome that customers can now make more intelligent purchasing decisions in a way which is not possible through traditional shopping.

Monsuwé et al., (2004) also concluded that an anonymous purchase for the items that are too personal to buy on stores is what brings customers online today.

Brown and Reid (1997) observed that routine tasks like shopping for groceries have become easier for customers who do not like crowds and driving the trolley around the store. Nowadays, people are more conscious about personal image and fashion, especially young adults. For them, shopping is an entertaining, pleasure-filled activity that is like an escape. And it is important to note that such shoppers are looking for good service standards too.

Source: Walker Sands' 2014 Future of Retail Study

Haubl and Trifts (2000) also mentioned that Customers tend to look for alternate options and compare prices while doing online shopping. Websites such as flipkart.com is providing a facility to compare between different products with just a few clicks.

Furthermore, according to Chen & Chang, (2003), while accessing online shopping websites, consumers can go through customers' reviews which can guide their purchasing decision. To comprehend the consumers' reasons to take part in shopping online, it is important to take into consideration the situational factors that lead to it.

Wolfinbarger and Gilly (2001) concluded that the foremost reason why most of the shoppers like to make online purchases is high accessibility and great convenience. Shopping from the comfort of your own house saves the effort of travelling. This is especially good for people who do not have enough time to go to the market, as the internet allows consumers to shop at any time throughout the day. Therefore, one of the key situational factors is the lack of time.

As per Monsuwé et al., 2004), the second situational factor is traveling as it is related to the distance consumers often need to travel to the stores which have the items they need. Consequently, online shopping helps them to reduce this burden. For instance, many people living in busy cities may not have the appropriate transportation to travel to more affordable shops.

Dennis et al., (2007) concluded that people living in big cities may be forced to shop at the costly town centers if it was not for the option to shop online. Ozen & Engizek, (2014) instigated the outcome that convenience is a major factor which motivates consumers to opt for online shopping.

Gehrt et al., (2012) performed a study on finding the reasons behind convenience of online shopping. Online retailing provides benefits in terms of place and time; shoppers can be saved from spending time going to crowded malls.

According to Li (1999) e-consumers are more acquainted with convenience rather than experience.

Li & Zhang, (2002) concluded that for e-consumers, convenience is the most significant aspect when making purchases as they have limited time and are not as bothered by the idea of purchasing goods without physically touching them.

Assael (1992) and Kotler (1997) identified that demographic variables offer valuable insights into 'Who consumers are' and 'What they need'. For instance, income may act as the main factor for consumer's purchasing power, and merchants should focus their marketing campaigns of luxury goods on those with high income. It is also common for e-commerce sites like amazon.com and ebay.com to request customers to fill in their demographic information during registration to experience personalized offerings.

MATERIALS AND METHODS

The scope of the study is to analyze customer behavior towards online shopping and study the factors affecting an individuals' choice.
The present study incorporates the collection of both primary and secondary data for an in depth investigation.
Primary data has been gathered through structured unbiased questionnaire. Out of the questionnaires mailed to 500 individuals, 370 responded back, therefore the sample size for the study stands at 370.

Measures of central tendency: these are ways of describing the central position of a frequency distribution for a group of data. This includes mean, median, skewness and kurtosis.

Measures of spread: These are ways of summarizing a group of data by describing how spread out the scores is. To describe

this spread, a number of statistics are available to us, including the range, quartiles, absolute deviation, variance and standard deviation.

Coefficient of Variation can be calculated to study the spread of overall data. Higher the coefficient of variation, higher the spread in the data.

Inferential Statistics

Statistical inference is the process of using data analysis to deduce properties of an underlying probability distribution. Inferential statistical analysis infers properties of a population, for example by testing hypotheses and deriving estimates. It is assumed that the observed data set is sampled from a larger population. We use p-value, Chi-square and likelihood ration test to test the hypothesis.

STATISTICAL ANALYSIS

Items purchased by Consumers Online viz- a- viz Conventional Stores

While retailers grapple with providing a consistent shopping experience among channels, new kinds of competitors seems to pop up out of nowhere, further altering customer expectations and disrupting any hoped-for status quo.

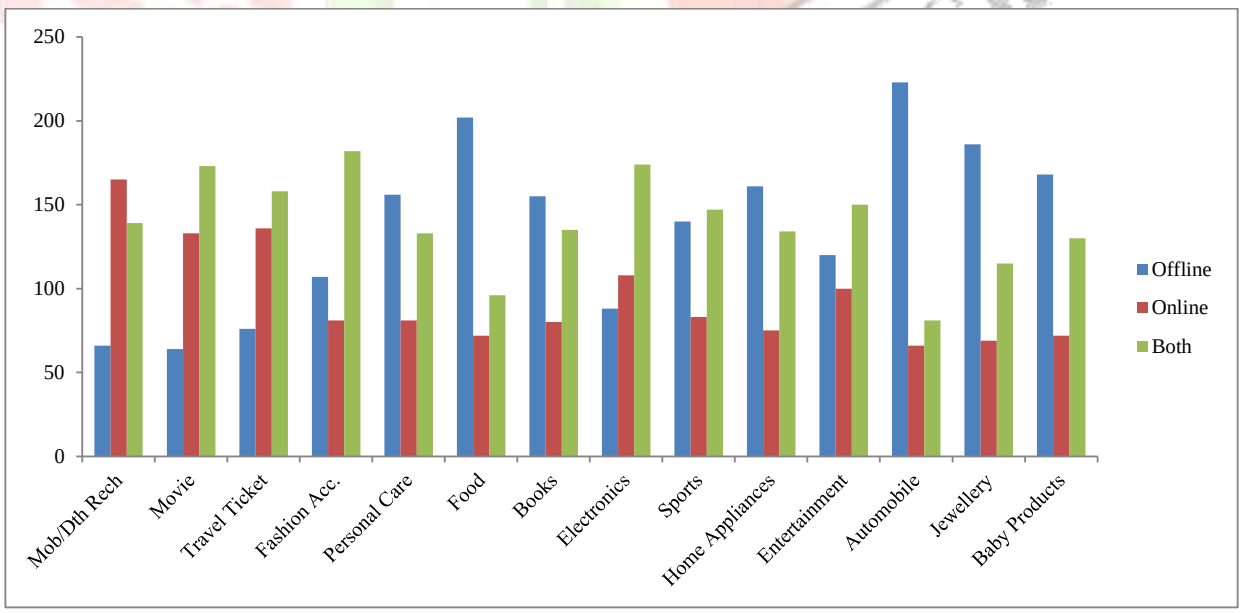
While studying the reach of online shopping websites, we decided to study the consumer preferences to resort to online shopping. The participants were given a choice to decide between online, offline or both methods as their choices.

List of products and results are shown as:

Table 1 Items purchased Online viz-a-viz Conventional Stores

Products	Off.	Online	Both
Mob/Dth Rech	66	165	139
Movie	64	133	173
Travel Ticket	76	136	158
Fashion Acc.	107	81	182
Personal Care	156	81	133
Food	202	72	96
Books	155	80	135
Electronics	88	108	174
Sports	140	83	147
Home Appliances	161	75	134
Entertainment	120	100	150
Automobile	223	66	81
Jewellery	186	69	115
Baby Products	168	72	130

Graph 1 Items purchased Online viz-a-viz Conventional Stores



Maximum participants prefer online methods of shopping for Mobile/DTH recharges whereas, movie tickets, fashion accessories, travel tickets and consumer electronics are the category of products which had mixed response.

Automobiles, jewellery, baby products and food are the categories that consumers prefer buying offline.

Books, Sports, Entertainment showed uniform responses.

Customer Shopping experience while doing online shopping

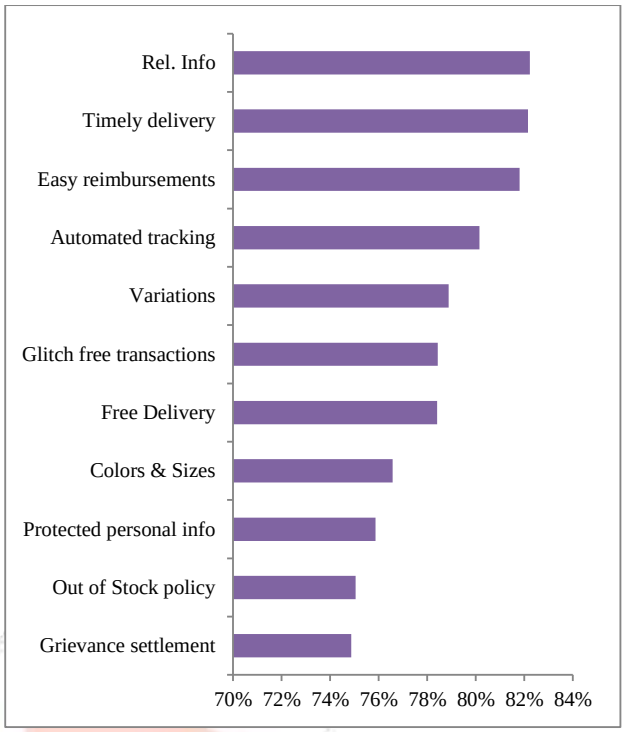
As part of our study, we devised eleven variables on the likert scale of (1-5) where 1 being the least contributor and 5 being the most.

We have used perception based tracker to test if the variable affects the overall customer satisfaction while doing online shopping.

Table 2 Perception based tracker for e-shopping experience of customers

	Scale					Descriptive Statistics		
Variables	**St.Dis**	**Dis**	**Neu**	**Agr**	**St.Agr**	**Mean**	**Std. Dev**	**C.V**
Rel. Info	15	68	327	416	540	185.36	225.41	82.23 %
Variations	14	44	222	444	745	240.56	304.95	78.88 %
Colours & Sizes	16	38	243	416	750	232.32	303.41	76.57 %
Out of Stock policy	15	46	291	400	675	203.92	271.74	75.04 %
Glitch free transactions	11	56	273	600	450	197.6	251.93	78.44 %
Protected personal info	13	42	204	404	835	255.92	337.34	75.86 %
Automated tracking	4	46	219	476	755	252.4	314.92	80.15 %
Free Delivery	14	46	243	440	710	227.52	290.18	78.41 %
Timely delivery	9	46	252	540	595	223.28	271.78	82.16 %
Easy reimbursements	19	74	306	432	520	178.96	218.78	81.80 %
Grievance settlement	17	38	288	656	370	197.04	263.19	74.87 %

Graph 2 Perception based tracker for e-shopping experience of customers



As discussed earlier, the higher the variation in the data least is its priority in affecting the targeted variable.

Consumer Satisfaction with online shopping is high. As shown in the descriptive statistics, coefficient of variation for 11 variables is between 75% to 82%. With overall satisfaction of consumers being decent, they are most satisfied by grievance settlement policy along with the services provided by seller to notify customer in case the product is out of stock.

While frequently cited by consumers as a must-have, free or discounted shipping is actually less important in driving overall satisfaction than those factors stated above, particularly ease of check-out and variety of brands and products offered. The factors that drive satisfaction and are highly important but currently have low satisfaction are – a clear and easy to understand returns policy and ease of making returns and exchanges – should be areas of focus for retailers looking to increase their overall customer satisfaction.

Online Versus Conventional methods of shopping

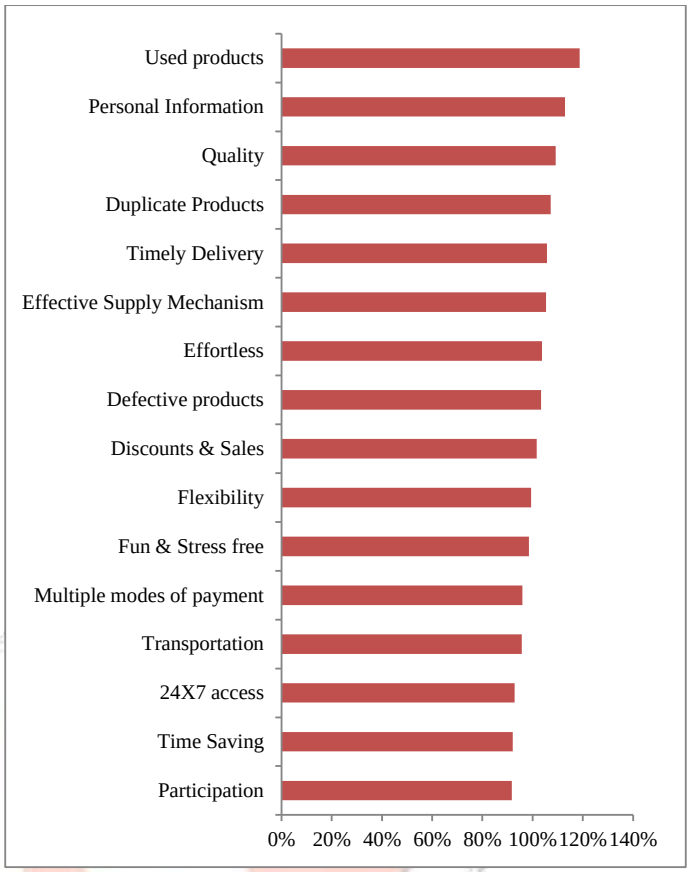
As part of our study, we devised ten variables on the likert scale of (1-5) where 1 being the least contributor and 5 being the most.

We have used perception based tracker to test if the variable affects the overall customer satisfaction while doing online shopping.

Table 3 Perception based tracker for customer loyalty while doing e-shopping

	Scale					Descriptive Statistics		
Variables	**St.Dis**	**Dis**	**Neu**	**Agr**	**Str. Agr**	**Mean**	**Std. Dev**	**C.V**
24X7 access	8	30	195	528	750	302.2	325.4	93%
Effortless	9	38	246	556	605	290.8	280.3	104 %
Flexibility	7	32	222	628	580	293.8	295.6	99%
Time Saving	11	38	246	388	805	297.6	323.2	92%
Multiple modes of payment	8	28	219	528	715	299.6	312.3	96%
Fun & Stress free	16	32	258	428	725	291.8	296.2	99%
Participation	10	50	180	472	785	299.4	326.3	92%
Transportation	24	48	237	364	760	286.6	299.4	96%
Quality	12	40	291	600	455	279.6	256.2	109 %
Effective Supply Mechanism	15	42	258	480	640	287	272.4	105 %
Timely Delivery	16	46	261	456	650	285.8	270.4	106 %
Discounts & Sales	15	42	213	632	525	285.4	280.7	102 %
Defective products	11	48	300	384	695	287.6	278.1	103 %
Used products	38	56	294	368	570	265.2	223.4	119 %
Duplicate Products	21	40	288	416	645	282	262.9	107 %
Personal Info	26	68	234	584	430	268.4	237.6	113 %

Graph 3 Perception based tracker for customer loyalty while doing e-shopping



As analyzed, participation of fellow friends and family, 24X7 access, time saving process, no hassle of travelling across distances are the factors that attract customers to do online shopping.

Without much difference in creating variation in the responses, multiple modes of payment, fun & stress free shopping experience along with availability of discounts and sales is what consumers love most about e-shopping.

Consumers are least affected by fear of getting used products or losing their personal information to anyone which is good heads up for e-tailers.

As we see from our study, we are in agreement to the past researches that say that shipping and delivery are key components in the online shopping experience. Online shoppers expect a variety of delivery options to be available, with more than half expecting both economy ground and ground, and just under half a 2-3 day air option. When looking at what shipping option they choose most often, online shoppers select the most economical option two-thirds of the time, and the fastest option only 2% of the time.

Inferential Statistics for factors affecting conventional shopping over online shopping

The null hypothesis is stated as that the given factors do not have any effect on the choice of an individual to prefer online shopping over conventional shopping.

H_0: Individuals are unbiased to prefer online shopping over conventional shopping

H_a: Individuals are biased to prefer online shopping over conventional shopping pertaining to demographical and other social factors

In the given table we study the prevalence rate of individuals doing online shopping over conventional shopping with respect to different factors.

The study shows that males (62%) tend to prefer to shop online as compared to females (38%). P-value for this variable is less than 0.05; hence we reject the null hypothesis and conclude that gender plays an important role in deciding that method of shopping – online or conventional. The results can be generalized for a large set of population.

The study shows that Education of an individual doesn't affect the method of shopping as p-value for running a chi-square test is greater than 0.05.

The results show that monthly income of an individual plays a significant role in choice of method of shopping P-value for this variable is less than 0.05; hence we reject the null hypothesis and conclude that monthly income plays an important role in deciding that method of shopping – online or conventional. The results can be generalized for a large set of population

Choice of website to do online shopping affect the overall choice as p-value is greater than 0.05.

78.2% of individuals believe that online shopping is a better method of purchasing products as it provides 24X7 accesses, p-value for same remains to be less than 0.05. Hence, we reject the null hypothesis that it would not affect the choice of an individual. The results can be generalized for a larger set of population as p-value for likelihood ratio test is greater than 0.05.

72.6% of individuals believe that online shopping is an effortless method over conventional shopping, p-value for same remains to be less than 0.05. Hence, we reject the null hypothesis that it would not affect the choice of an individual. The results can be generalized for a larger set of population as p-value for likelihood ratio test is greater than 0.05.

75.9% of individuals believe that online shopping is a flexible method over conventional shopping, p-value for same remains to be less than 0.05. Hence, we reject the null hypothesis that it would not affect the choice of an individual. The results can be generalized for a larger set of population as p-value for likelihood ratio test is greater than 0.05.

71.6% of individuals believe that online shopping is a time-saving method over conventional shopping, p-value for same is greater than 0.05. Hence, we accept the null hypothesis that it would not affect the choice of an individual. The results can't be generalized for a larger set of population as p-value for likelihood ratio test is greater than 0.05.

78.2% of individuals believe that availability of multiple modes of payment while online shopping is a driving factor to shop online, p-value for same remains to be less than 0.05. Hence, we reject the null hypothesis that it would not affect the choice of an individual. The results can be generalized for a larger set of population as p-value for likelihood ratio test is greater than 0.05.

70.3% of individuals believe that online shopping is a fun and stress free method to shop online, but p-value for same is greater than 0.05. Hence, we accept the null hypothesis that it would not affect the choice of an individual. The results can't be generalized for a larger set of population as p-value for likelihood ratio test is greater than 0.05.

66% of individuals believe that online shopping is better as it involves no transportation cost, but p-value for same is greater than 0.05. Hence, we accept the null hypothesis that it would not affect the choice of an individual. The results can't be generalized for a larger set of population as p-value for likelihood ratio test is greater than 0.05.

67% of individuals believe that products purchased online are procured through trusted suppliers, but p-value for same is greater than 0.05. Hence, we accept the null hypothesis that it would not affect the choice of an individual. The results can't be generalized for a larger set of population as p-value for likelihood ratio test is greater than 0.05.

68.3% of individuals believe that there is effective supply chain mechanism while online shopping is a driving factor to shop online, p-value for same remains to be less than 0.05. Hence, we reject the null hypothesis that it would not affect the choice of an individual. The results can be generalized for a larger set of population as p-value for likelihood ratio test is greater than 0.05.

56% of individuals believe that online shopping leads to timely delivery of products, p-value for same is greater than 0.05. Hence, we accept the null hypothesis that it would not affect the choice of an individual. The results can't be generalized for a larger set of population as p-value for likelihood ratio test is greater than 0.05.

72.7% of individuals believe that online shopping is a preferred method of shopping because of availability of large number of discounts and sales, p-value for same remains to be less than 0.05. Hence, we reject the null hypothesis that it would not affect the choice of an individual. The results can be generalized for a larger set of population as p-value for likelihood ratio test is greater than 0.05.

67.6% of individuals believe that there might be chance of receiving defective products while shopping online, p-value for same remains to be less than 0.05. Hence, we reject the null hypothesis that it would not affect the choice of an individual. The results can be generalized for a larger set of

population as p-value for likelihood ratio test is greater than 0.05.

58.4% of individuals believe that one might receive used products while shopping online, but p-value for same is greater than 0.05. Hence, we accept the null hypothesis that it would not affect the choice of an individual. The results can't be generalized for a larger set of population as p-value for likelihood ratio test is greater than 0.05

56% of individuals believe there might be chance of receiving duplicate products while shopping online, p-value for same remains to be less than 0.05. Hence, we reject the null hypothesis that it would not affect the choice of an individual. The results can be generalized for a larger set of population as p-value for likelihood ratio test is greater than 0.05.

66% of individuals believe that there might be chance losing personal information while using debit/credit cards as mode of payments for shopping online,, p-value for same remains to be less than 0.05. Hence, we reject the null hypothesis that it would not affect the choice of an individual. The results can be generalized for a larger set of population as p-value for likelihood ratio test is greater than 0.05.

Table 4 Inferential Statistics for factors affecting conventional shopping over online shopping

Factors Affecting Online Shopping	N (%)	Chi Sq.	Likelihood Ratio
Gender			
Male	62%	χ^2 = 12.152	L.R = 12.019
Female	38%	P = 0.000	P = 0.001
Education			
Diploma	5.0%		
Inter/12th	13.5%		
P.hD	2.0%	χ^2 = 7.039	L.R = 7.410
Post Graduate	22.4%	P = 0.317	P = 0.285
Professional	2.6%		
SSC/10th	1.0%		
Undergraduate	53.5%		
Monthly Income			
Less than Rs. 1,00,000	41.6%		
Rs. 1,00,000 – Rs. 2,00,000	22.8%	χ^2 = 20.575	L.R = 20.252
Rs. 2,00,000 – Rs. 3,00,000	19.1%	P = 0.000	P = 0.000
Rs. 3,00,000 and above	16.5%		
Websites that you would recommend	48.5%		
Amazon	2.0%	χ^2 = 6.408	L.R = 6.850
Ebay	28.7%	P = 0.171	P = 0.144
Flipkart	11.9%		
Snapdeal	8.9%		
Other			
Purchasing online is more convenient, as it has 24/7 access	1.7%		
Strongly Disagree	3.6%	χ^2 = 10.047	L.R = 9.512
Disagree	15.5%	P = 0.040	P = 0.049
Neutral	38.3%		
Agree	40.9%		
Strongly Agree			
Effortless shopping is possible through online shopping	2.0%		
Strongly Disagree	3.0%	χ^2 = 22.287	L.R = 18.947
Disagree	22.4%	P = 0.000	P = 0.001
Neutral	40.9%		
Agree	31.7%		
Strongly Agree			
Facilitates flexibility in online shopping			
Strongly Disagree	1.3%		
Disagree	2.3%	χ^2 = 19.843	L.R = 15.219
Neutral	20.5%	P = 0.001	P = 0.004
Agree	43.9%		
Strongly Agree	32.0%		
Time saving shopping experience provided			
Strongly Disagree	2.3%		
Disagree	5.3%	χ^2 = 5.558	L.R = 5.143
Neutral	20.8%	P = 0.235	P = 0.273
Agree	26.1%		
Strongly Agree	45.5%		
Availability of multiple modes of payment			
Strongly Disagree	1.0%		
Disagree	2.0%	χ^2 = 30.175	L.R = 23.946
Neutral	18.8%	P = 0.000	P = 0.000
Agree	38.6%		
Strongly Agree	39.6%		
Online shopping is fun and stress free	3.6%		
Strongly Disagree	4.3%	χ^2 = 5.878	L.R = 5.731
Disagree	21.8%	P = 0.208	P = 0.220
Neutral	28.7%		
Agree	41.6%		
Strongly Agree			
Smooth participation of family and friends without any cost	2.3%		
Strongly Disagree	4.3%	χ^2 = 18.497	L.R = 38.251
Disagree	16.2%	P = 0.001	P = 0.000
Neutral	32.3%		
Agree	44.9%		
Strongly Agree			
Online shopping requires no transportation cost	6.3%		
Strongly Disagree	6.9%	χ^2 = 2.702	L.R = 2.736
Disagree	20.8%	P = 0.609	P = 0.603
Neutral	23.4%		
Agree	42.6%		
Strongly Agree			
Quality products are procured through various trusted suppliers	3.0%		
Strongly Disagree	4.3%	χ^2 = 6.103	L.R = 5.554
Disagree	25.7%	P = 0.192	P = 0.235
Neutral	42.6%		
Agree	24.4%		
Strongly Agree			
Online stores have effective supply mechanism	4.3%		
Strongly Disagree	4.0%	χ^2 = 13.479	L.R = 12.047

Disagree Neutral Agree Strongly Agree	23.4% 31.0% 37.3%	P = 0.009	P = 0.017
Timely delivery services provided by online store Strongly Disagree Disagree Neutral Agree Strongly Agree	 4.3% 5.0% 24.8% 29.4% 36.6%	χ^2 = 7.601 P = 0.107	L.R = 6.985 P = 0.137
Offers special discounts and sales to customers Strongly Disagree Disagree Neutral Agree Strongly Agree	 3.0% 4.3% 20.1% 44.6% 28.1%	χ^2 = 12.686 P = 0.013	L.R = 10.844 P = 0.028
Defective products may be a great concern in online shopping Strongly Disagree Disagree Neutral Agree Strongly Agree	 1.3% 4.3% 26.7% 26.7% 40.9%	χ^2 = 33.288 P = 0.000	L.R = 26.947 P = 0.000
There may be chance of receiving used products in online shopping Strongly Disagree Disagree Neutral Agree Strongly Agree	 9.2% 6.3% 26.1% 26.1% 32.3%	χ^2 = 7.811 P = 0.099	L.R = 7.259 P = 0.123
There may be risk of getting duplicate products Strongly Disagree Disagree Neutral Agree Strongly Agree	 3.3% 4.0% 26.7% 28.7% 37.3%	χ^2 = 26.546 P = 0.000	L.R = 21.489 P = 0.000
There may be risk of sharing debit/credit card information to others by website Strongly Disagree Disagree Neutral Agree Strongly Agree	 5.3% 7.6% 21.1% 41.9% 24.1%	χ^2 = 14.991 P = 0.005	L.R = 13.220 P = 0.010

CONCLUSION

Online shopping or e-shopping as we may call it is one of the glorious inventions of 21st century which lets people get their hands laid on anything and everything from the comfort of their homes. No travel hassles, no dealing with over enthusiastic sales persons at the counter – that's what e-shopping offers us.

But online shopping is not all about roses. There are different challenges that one has to face while shopping online.

The consumers are least satisfied by the information given of the product followed by reviews. Indian e-commerce websites need to work on betterment of information of products followed by improvement in time needed to deliver the products.

Most of the consumers today feel safe while sharing personal information followed by satisfaction derived from having variety of products in terms of colors, sizes and prices of the product.

For retailers looking to increase customer satisfaction, it is important to look not only at how satisfied users are with various aspects of the online shopping experience, but also how important these factors are. To online shoppers, the ease of making returns/exchanges is above average in importance but falls short in terms of satisfaction. It is crucial for retailers to continue to maintain high levels of satisfaction on these elements – ease of check-out, variety of brands and products offered, and the ability to create an account to store purchase history and personal information.

Making a choice between selling online through an e-Commerce store, and selling in a traditional bricks-and-mortar location can be incredibly difficult. Online shopping trend is growing at an exponential rate but there are still majority of people who prefer to shop directly from the offline stores.

A lenient and clear returns policy is likely to lead to recommendations and repeat business from online shoppers. Almost half said they would be likely to shop more often with a retailer or recommend a retailer to a friend if the retailer had a lenient and easy-to-understand return policy. More than one-third said they would drop another retailer with a less easy returns policy. Clearly, good returns policies are a great way to increase customer loyalty.

In addition to having a good returns policy, it is important for retailers to provide a good returns experience. Online shoppers who have made returns prefer the inclusion of a return label in their original package or access to an easy-to-print label. An automatic refund is also very important in ensuring a good returns experience.

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EXPERIMENTAL RESEARCH INTO THE EXHAUST GAS RECIRCULATION ON COMBUSTION CHARACTERISTICS OF DI DIESEL ENGINE ADOPTING DIFFERENT AIR FILTERS

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ABSTRACT: The exhaust gas recirculation technique has proven a better solution to reduce NOx emission in diesel engines. EGR method is taken for the study to investigate the engine behavior on its combustion. In this paper the combustion characteristics such as heat release rate (HRR), cylinder pressures are presented and discussed. The discussion is presented and supported by experimental results. In the experimentation variation in EGR percentage for different air filters is selected for the study. The engine is run by adopting one type of filter at once at different loads for different percentages of EGR such as 5%, 10% and 15%.

***Key words**: Diesel engine, Air filters, Combustion Characteristics, EGR.*

1. INTRODUCTION

The air filter separation efficiency was studied for particle size of 50 and 100µm, it was found to be 94.4%. The study was made with both experimental and simulation methods. Pressure drop in the analysis was well matched with experimental results [1]. The air filters are used in automotive cabin and engine are investigated for their standards and filtration behaviors. The actual air filter performance and their definitions are related to the real time conditions. In the investigation relation between primary function of the air filter and defined one are analyze and the changes for the recommended [2]. The air filter design is critical because of the factors like limited space availability in the induction system for higher velocity of aerosol passing in the primary air filter but this increased velocity causes re-trapping of dust particles and increased dust penetration through the filter [3]. The frequency of replacing the air filter depends on its optimum usage which can reduce its cost and extended its life. The experiments conducted in optimizing geometrical configuration of intake system to keep reduced pressure drop and improved utilization of filter area. CFD analysis was made to improve air flow characteristics through the filters. An eccentricity was suggested in the filter element The eccentricity place a role of maintaining air velocity at constant in annular portion. This constant value of velocity resulted in lowering pressure drop was found to be higher for an eccentricity placed at 15mm distanced from the inlet [4]. When Exhaust Gas in which the Recirculation (EGR) on the performance and emissions of a single cylinder naturally aspirated constant speed diesel engine is studied. The results showed that EGR would be one option to reduce the nitrous oxide emissions, but with a rise in EGR rate the CO, UHC concentrations in the engine exhaust are increased [5 & 6]. When the effects of hot and cold EGR methods on emissions and efficiency of the engine is provided for obtaining different EGR methods in which the performance parameters were studied with and without exhaust gas recirculation of different methods with

10%, 15% and 20% of EGR[7& 8]. The technology adopted for the reticulated foam multilayer filters calls for no servicing and maintenance throughout the life of the vehicle i.e, 150000 miles. The technology adopted for these type of filters facilitates sum unique advantages compare to traditional air filters [9]. The restriction for air flow will be naturally higher in old filter than that of new [10]. When investigation made on air filters and their traps in different locations with different vegetation zones to study the efficiency of air filters used in motor cars. It was revealed that on efficiency filter traps will capture only the airborne particles. The contamination due to vegetation is also consider along with animal derived debris [11]. In this paper the performance characteristics and the exhaust gas emissions of stationary diesel engine are presented and discussed which is supported by experimental results. In the experimentation variation in EGR percentage for different air filters is selected for the study. The engine is run by adopting one type of filter at once at different loads for different percentages of EGR such as 5%, 10% and 15%.

2. EXPERIMENTAL SETUP

The experimentation is carried out on a single cylinder, four stroke, water cooled, DI engine. The test set up is developed to carry out set experimentation procedures. The layout of the experimental set up is shown in the Fig. 2.1. and Fig. 2.2 shows Photographic View of Computerized Experimental Diesel Engine Setup.

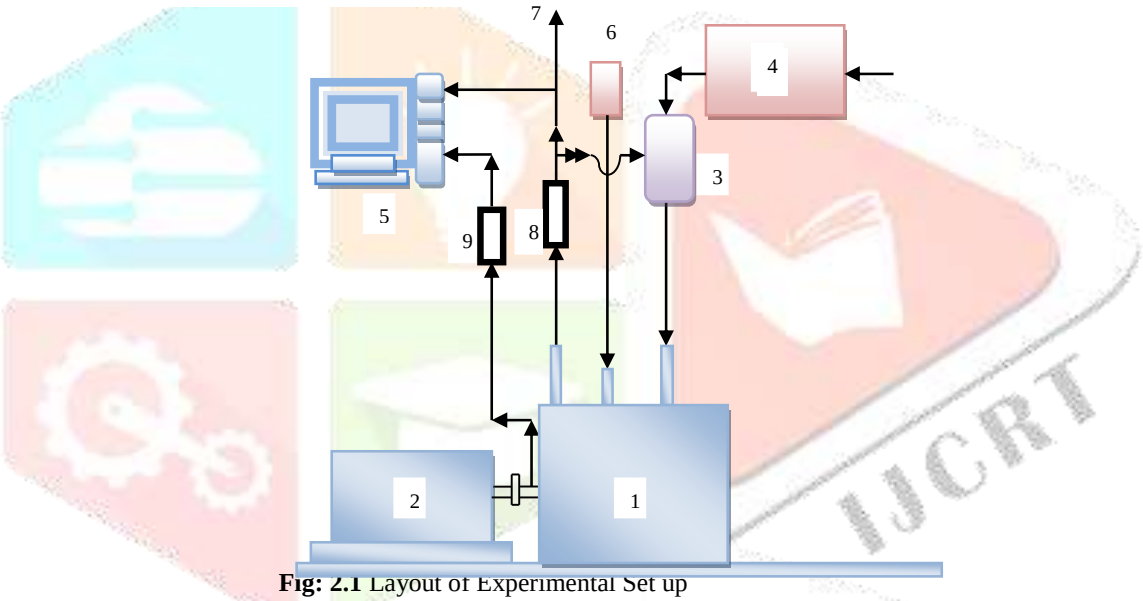

Fig: 2.1 Layout of Experimental Set up

1) Engine, 2) Dynamometer, 3) Air Filter Housing, 4) Air surge tank, 5) Computerized data acquisition, 6) Diesel fuel tank, 7) Exhaust Manifold, 8) Exhaust gas recirculation unit, 9) Crank angle encoder.

Make	Kirloskar AV-1
Engine type	4- stroke single cylinder diesel engine(water cooled)
Rated Power	3.7KW, 1500rpm
Bore & stroke	80mmx110mm
Compression rate	16.5:1 (Variable From 14.3to20)
Cylinder Capacity	553cc
Dynamometer	Electrical-AC alternator

Table.1 Engine specification

Fig: 2.2 Photographic View of Computerized Diesel Engine Setup with Air Filter Housing Arrangements and EGR Facility

2.2 Experimentation Procedure

The experiments are conducted on test engine in different stages. The engine is experimented without air filter considering as baseline operation to make the comparison study. In second stage the engine is run by adopting the air filter of type 1 (AFM1) - Model No. NF 1004 both with new and clogged filters one after the other. In third stage the engine is run by adopting the air filter of type 2 (AFM2) - Model No. NF615 both with new and clogged filters one after the other. In fourth stage the engine is run by adopting the air filter of type 3 (AFM3) - Model No. NF560 both with new and clogged filters one after the other. In fifth stage the engine is run by adopting the air filter of type 4 (AFM4) - Model No. 0313AC2261N both with new and clogged filters one after the other.

Fig: 2.4(a) AFM1 (OLD& NEW)

Fig: 2.4 (b) AFM2 (OLD& NEW)

Fig: 2.4 (c) AFM3 (OLD& NEW)

Fig: 2.4 (d) AFM4 (OLD& NEW)

3. RESULTS AND DISCUSSION

3.1 Combustion Characteristics

3.1.1 Cylinder pressure

The variation of cylinder pressure against crank angle of the engine for different filters, AFM1, AFM2, AFM3 and AFM4 with varying percentages of exhaust gas recirculation is presented and discussed below. The exhaust gas percentage is varied by 5, 10 and 15 percentages in the inlet.

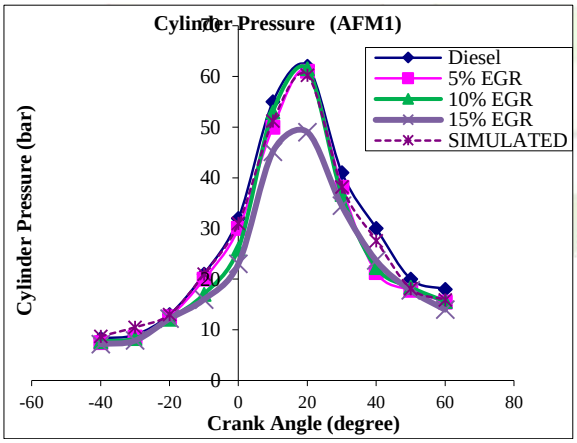

Fig: 3.1.1(a)

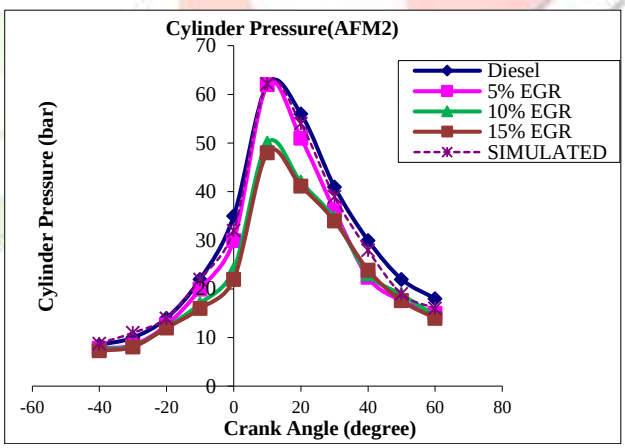

Fig: 3.1.1(b)

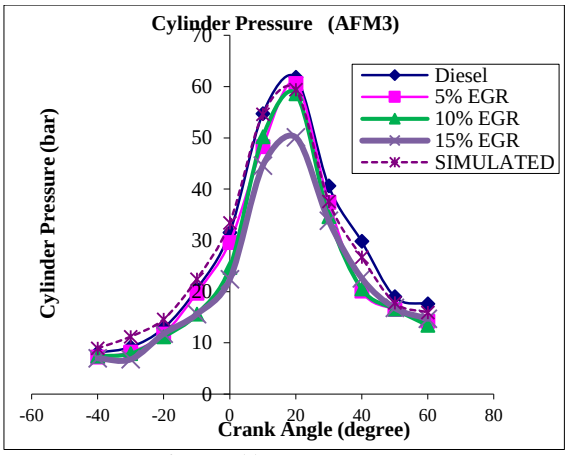

Fig: 3.1.1(c)

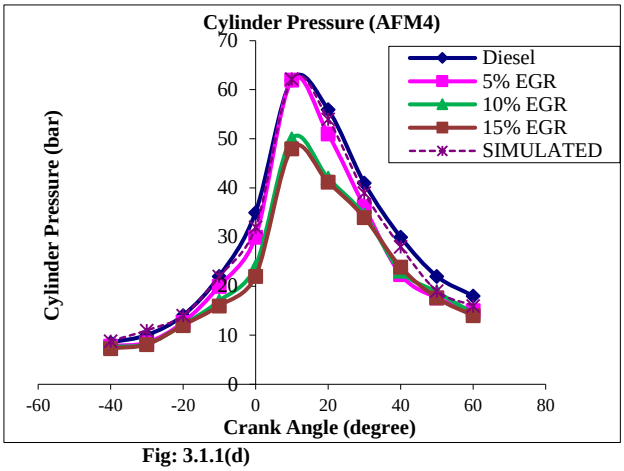

Fig: 3.1.1(d)

Fig: 3.1.1(a) to Fig: 3.1.1(d) Effect of EGR percentage on cylinder pressure adopting AFM1, AFM2, AFM3 & AFM4.

The cylinder pressure as a function of crank angle is presented in figure 3.1.1(a) to 3.1.1(d). In the figure 3.1.1(a) the effect of percentage of exhaust gas recirculation on cylinder pressure for the filter AFM1is presented. For each percentage of EGR the graphs are plotted against crank angle the simulated values are also compared. As the percentage of EGR increases the cylinder pressure found to be decreasing marginally for 5, 10 & 15% percent of EGR when compared to diesel fuel operation without EGR. The decrease in cylinder pressure was recorded in the range of 2 to 5%. The values at crank angle 18 ATDC for 5, 10 & 15% percent of EGR were 62, 65 and 53 bar when compared to 65 of diesel operation without EGR. The values are well matched with simulated results.

In the figure 3.1.1(b) the effect of percentage of exhaust gas recirculation on cylinder pressure for the filter AFM2 is presented. For each percentage of EGR the graphs are plotted against crank angle the simulated values are also compared. As the percentage of EGR increases the cylinder pressure found to be decreasing for 5, 10 & 15% percent of EGR when compared to diesel fuel operation without EGR. The decrease in cylinder pressure was recorded in the range of 4 to 9%. The values at crank angle 18 ATDC for 5, 10 & 15% percent of EGR were 60, 50 and 49 bar when compared to 62 of diesel operation without EGR. The values are well matched with simulated results.

In the figure 3.1.1(c) the effect of percentage of exhaust gas recirculation on cylinder pressure for the filter AFM3 is presented. For each percentage of EGR the graphs are plotted against crank angle the simulated values are also compared. As the percentage of EGR increases the cylinder pressure found to be decreasing marginally for 5, 10 & 15% percent of EGR when compared to diesel fuel operation without EGR. The decrease in cylinder pressure was recorded in the range of 2 to 6%. The values at crank angle 18 ATDC for 5, 10 & 15% percent of EGR were 60, 58 and 50 bar when compared to 62 of diesel operation without EGR. The values are well matched with simulated results.

In the figure 3.1.1(d) the effect of percentage of exhaust gas recirculation on cylinder pressure for the filter AFM4 is presented. For each percentage of EGR the graphs are plotted against crank angle the simulated values are also compared. As the percentage of EGR increases the cylinder pressure found to be decreasing for 5, 10 & 15% percent of EGR when compared to diesel fuel operation without EGR. The decrease in cylinder pressure was recorded in the range of 4 to 10%. The values at crank angle 18 ATDC for 5, 10 & 15% percent of EGR were 50, 45 and 51 bar when compared to 56 of diesel operation without EGR. The values are well matched with simulated results.

3.1.2 Heat release rate

The variation of heat release rate against crank angle of the engine for different filters, AFM1, AFM2, AFM3 and AFM4 with varying percentages of exhaust gas recirculation is presented and discussed below. The exhaust gas percentage is varied like 5, 10 and 15 percentages in the inlet.

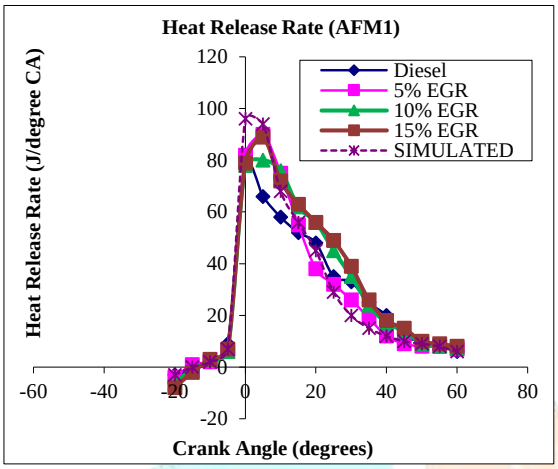

Fig: 3.1.2(a)

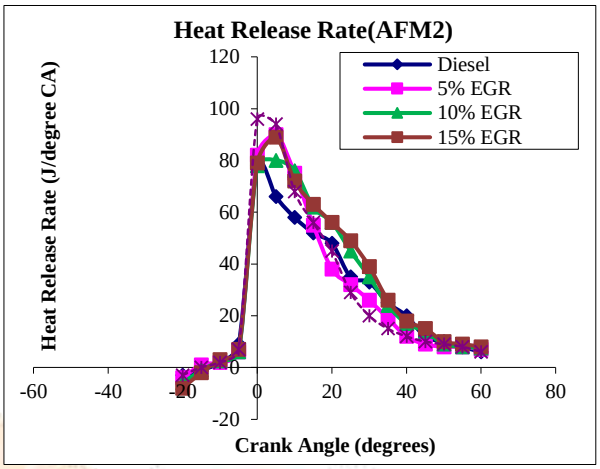

Fig: 3.1.2(b)

In the figure 3.1.2(a) the effect of percentage of exhaust gas recirculation on heat release rate for the filter AFM1is presented. For each percentage of EGR the graphs are plotted against crank angle the simulated values are also compared. As the percentage of EGR increases the heat release rate found to be increasing when compared to diesel fuel operation without EGR for 5, 10 & 15% percent of EGR. The increase in heat release rate was recorded in the range of 10 to 30%. The values at crank angle 8 ATDC for 5, 10 & 15% percent of EGR were 75, 76 and 78 J/degree CA when compared to 58 of diesel operation without EGR. The values are well matched with simulated results.

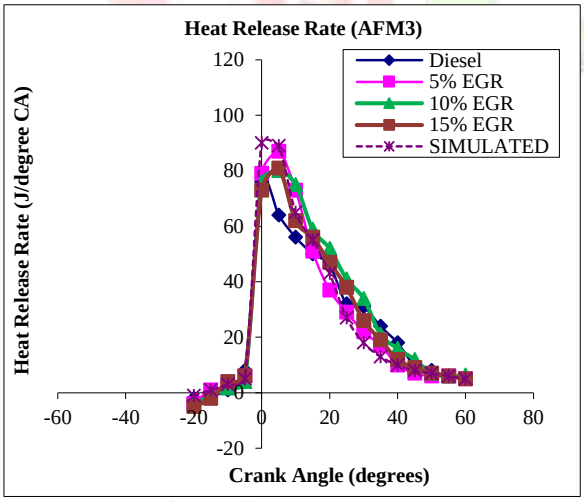

Fig: 3.1.2(c)

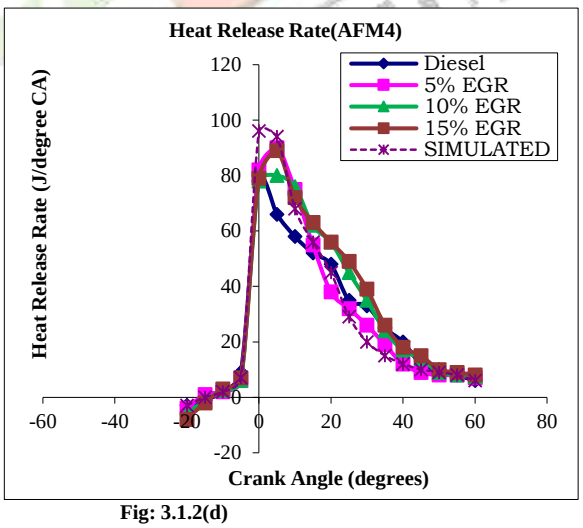

Fig: 3.1.2(d)

Fig: 3.1.2(a) to Fig: 3.1.2(d) Effect of EGR percentage on Heat release rate adopting AFM1, AFM2, AFM3 & AFM4

In the figure 3.1.2(b) the effect of percentage of exhaust gas recirculation on heat release rate for the filter AFM2 is presented. For each percentage of EGR the graphs are plotted against crank angle the simulated values are also compared. As the percentage of EGR increases the heat release rate found to be increasing when compared to diesel fuel operation without EGR for 5, 10 & 15% percent of EGR. The increase in heat release rate was recorded in the range of 10 to 25%. The values at crank angle 8 ATDC for 5, 10 & 15% percent of EGR were 75, 76 and 78 J/degree CA when compared to 58 of diesel operation without EGR. The values are well matched with simulated results.

In the figure 3.1.2(c) the effect of percentage of exhaust gas recirculation on heat release rate for the filter AFM1is presented. For each percentage of EGR the graphs are plotted against crank angle the simulated values are also compared. As the percentage of EGR increases the heat release rate found to be increasing when compared to diesel fuel operation without EGR for 5, 10 & 15% percent of EGR. The increase in heat release rate was recorded in the range of 15 to 30%. The values at crank angle 8 ATDC for 5, 10 & 15% percent of EGR were 73, 75 and 70 J/degree CA when compared to 56 of diesel operation without EGR. The values are well matched with simulated results.

In the figure 3.1.2(d) the effect of percentage of exhaust gas recirculation on heat release rate for the filter AFM1is presented. For each percentage of EGR the graphs are plotted against crank angle the simulated values are also compared. As the percentage of EGR increases the heat release rate found to be increasing when compared to diesel fuel operation without EGR for 5, 10 & 15% percent of EGR. The increase in heat release rate was recorded in the range of 5 to 25%. The values at crank angle 8 ATDC for 5, 10 & 15% percent of EGR were 75, 76 and 72 J/degree CA when compared to 58 of diesel operation without EGR. The values are well matched with simulated results.

4. CONCLUSIONS:

- As the percentage of EGR increases the cylinder pressure for all filters found to be decreasing marginally for 5, 10 & 15% percent of EGR when compared to diesel fuel operation without EGR.
- At 5% of EGR all the filters AFM1, AFM2, AFM3 & AFM4 have given more cylinder pressure by 10 to 15%.
- As percentage of EGR increases the heat release rate for all filters found to be increasing when compared to diesel fuel operation without EGR for 5, 10 & 15% percent of EGR.
- The filter AFM2 has produced uniform cylinder pressure and it is near TDC when compared to other filters.

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Implementation of Crime Patterns Prediction Using Data Mining

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***Abstract*:** Crime against women is an age old phenomenon. A total of 3,09,547 cases of crime against women were reported according among the country among the year a mixture of a combine of 2013 as compared to 2,44,271 in 2012, therefore showing a rise of 26.7% throughout the year 2013. With the increase in rate of crimes against women, there is imperative ought to analyses the data and develop tools & techniques that can help the concerned authorities to suitable measures to mitigate increasing crime against women. A number of algorithms have already been designed in the data mining field. The objective of this paper is to study and analyze the performance of distinguished data processing techniques viz. Naive Bayes & Time Series Algorithms for Predict crimes against women. The performance is measured in terms of your time taken, properly and incorrectly classified instances and accuracy. From the experimental results, it absolutely was found that Naïve Bayes &Time Series Algorithms square measure higher than alternative algorithms.

Keywords: **Decision Tree, Naïve Bayes & Time Series Algorithm, Data Mining, Crime against Women.**

I.INTRODUCTION

I.1 Crimes Against Women

Crime against women has become a prominent topic of discussion in India especially after Nirbhaya's incident on 16th of December, 2012 in Delhi. The issue comes forth time to time in the form of gang-rape, sexual harassment, acid attack, dowry death, domestic violence, human trafficking and forced prostitution, marital rapes, honour killings, stalking etc. It is deeply rooted in our Indian society despite increasing literacy rate. The major reasons of it are male dominated social and political structures, inefficient legal justice system and weak rules of law. Apart from this, social negligence of women's survival, her development and economic rights, and women's own ignorance and disregard of their own rights are also among the major reasons.

According to the National Crime Records Bureau of India, reported incidents of crime against women increased 6.4% during 2012, and a crime against a woman is committed every three minutes.

In 2012, there were a total of 244,270 reported incidents of crime against women, while in 2011, there were 228,650 reported incidents. Of the women living in India, 7.5% live in West Bengal where 12.7% of the total reported crime against women occurs. Andhra Pradesh is home to 7.3% of India's female population and accounts for 11.5% of the total reported crimes against women [9].

With the increase in reporting of crimes against women, there is need for accurate and timely information to react to women crime such as identifying the age group of those who are mostly involved in crime, relation of the accused with victim. Analysis can be made regarding which age groups of girls are the main target of criminals. Apart from this, there is need to recognize public areas especially the dark areas which have high probability of crime rate so that suitable steps can be taken to prevent the same. By analyzing previous similar crime cases, we can identify the criminal or his attributes such as age group, relation etc. in new crime cases. Thus there is urgent need to analyze the data and develop tools & techniques that can help the concerned authorities to suitable measures to mitigate increasing crime against women.

I.2 Data Mining

In modern world a huge amount of data is available which can be used effectively to produce vital information. The information achieved can be used in many real life applications especially in the field of Medical science, Education, Business, Agriculture and so

on. As huge amount of data is being collected and stored in the databases, traditional statistical techniques and database tools are no longer adequate for handling this huge amount of data [10].

I.2.1 Introduction

Data mining refers to extracting or “mining" knowledge from large amounts of data. Data mining which is also called as “Knowledge discovery from data or KDD” is the process of discovering interesting patterns and relations from voluminous amount of data. It is an essential process in today’s world because it uncovers hidden patterns for evaluation. These patterns can then be used for marketing analysis, making strategies, taking decisions, to increase revenues etc. Data mining provides a number of analytical tools and algorithms for analyzing data. It provides various functionalities to data like multidimensional views of data, pre-processing of data, classifying data into classes according to their features, clustering the data etc.

I.2.2 Why use data mining?

Two main reasons to use data mining:

Too much data and too little information.

Need to extract useful information from the data.

Dealing huge volumes of data with no special tools make human analysts’ work very difficult. Data mining is used especially in science and business areas where there is need to analyze voluminous amount of data to discover patterns which they could not otherwise find. Besides these, data mining can be used in any field like banking, finance, retail, engineering, medical, web etc. [8].

I.2.3 Data Mining Process

Data mining consists of five major elements as explained in figure 1.

- Extraction and transformation of data onto the data warehouse system.
- Run data on multidimensional database system in a managed way
- providing data access to business analysts and other professionals
- Data analyzing
- Presentation of data in useful and required formats such as tables and graphs.

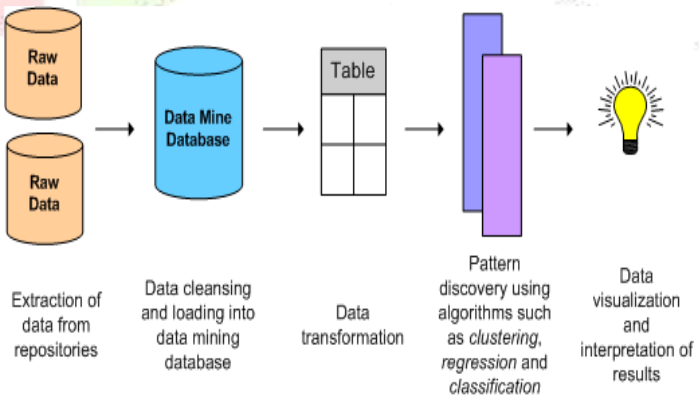

Fig 1.Data Mining Process

Since data mining is highly application-driven, it is not possible to enumerate all applications where data mining plays a critical role. Some of the notable applications of data mining are science and engineering mining, business mining, spatial data mining, visual data mining, sensor data mining, pattern mining, medical data mining, web mining etc.

II.APPROACH

In this report, three techniques (decision tree, Naïve Bayes and Time Series Algorithms) have been studied, analyzed and implemented. These algorithms are explained as follows:-

II.1.1 Decision Tree

Decision tree is a powerful classification technique. The decision trees, take the case described by its features as input, and outputs a decision. Each leaf node corresponds to a class label. A new example is classified by following a path from the root node to a leaf node, where at each node a test is performed on some feature of that example. The leaf node reached is considered the class label for that example. Figure .2 shows an example of decision tree representing root node, leaf nodes and internal nodes.

It is a flowchart-like structure in which each internal node is a test on an attribute, each branch is an outcome of test and each leaf node represents class (decision taken after computing all the attributes). A path from root to leaf represents classification rules [1]. In figure 3.shows the decision tree for analyzing crimes against women. Figure 4. Represents an activity diagram which gives estimated results of crimes against women.

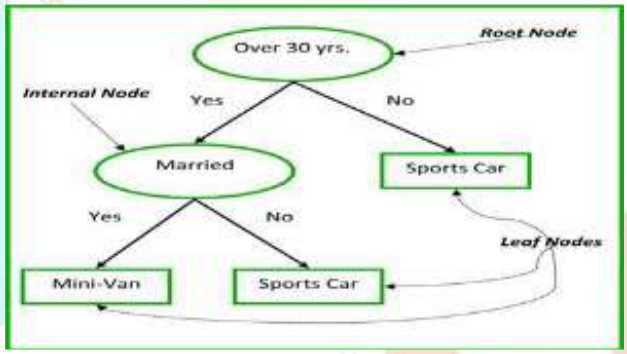

Fig 2.Decision Tree

Some of the major advantages of decision tree algorithm are:

- Simple to understand and interpret. People are able to understand decision tree models easily due to its flowchart like structure.
- **Requires little data preparation.** Other techniques often require data normalization, dummy variables etc.
- **Able to handle both numerical and categorical data.** Other techniques are usually specialized in analyzing only one type of variable.
- **Possible to validate a model using statistical tests.**
- **Robust.** Performs well even if its assumptions limited.
- **Performs well with large datasets.** Large amounts of data can be analyzed using standard computing resources in reasonable time [1].

Fig 3: Decision Tree for analyzing crimes against women

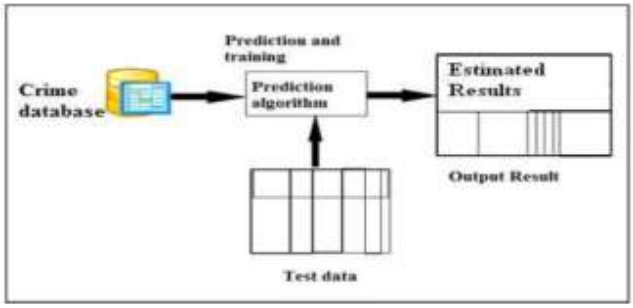

Fig 4: Activity Diagram

III.ALGORITHMS

III.1 Naïve Bayes Algorithm

For classification we are using an algorithm called Naïve Bayes and Time Series algorithms which is a supervised learning method as well as a statistical method for classification.

The Naive Bayes classifier is a simple probabilistic classifier that calculates a set of probabilities by counting the frequency and combinations of values in a given data set. The algorithm uses Bayes theorem and assumes all attributes to be independent given the value of the class variable, hence the characterization as Naive yet the algorithm tends to perform well and learn rapidly in various supervised classification problems [6].

The advantage of using Naive Bayes algorithm is that it is simple, easy to use, and quicker than the other algorithms like SVM (Support Vector Machine) which takes lots of size of memory and the easy for implementation and high-performance which makes this algorithm different from other algorithms. Using Naive Bayes algorithm we create a model by teach them on particular inputs such that we can test them for unknown inputs crime data belongs to murder, robbery, burglary, sex abuse, gang rape, arson, armed robbery, highway robbery, snatching etc. For testing the accuracy of the model we apply the test data. Unlike SVM as the size of training data increases accuracy of test set also increases. Another advantage of Naïve Bayes is that it works well for small amount of training set data to calculate the classification parameters. Also it fixes the Zero-frequency problem .

Naive Bayes shows more than 90% accuracy than the other algorithms. We have shown a simple pseudo code of Naïve Bayes theorem. So by using this concept in crime article we can get more details related to crime like victim and offender names, location of crime, date, time etc.

Algorithm 1 Pseudocode

1. Given training data set D which consist of documents belonging to different class say class A & B.

2. Calculate the prior probability of class A=number of objects of class A / total no of objects.

Calculate the prior of class B=number of objects of class B / total no of objects.

3. Find ni, the total no of word frequency of each class.

na= the total no of word frequency of class A.

nb=the total no of word frequency of class B.

4.Find conditional probabilty of keyword occurance given a class.

P(word1 / class A) = wordcount / ni(A)

P(word1 / class B) = wordcount / ni(B)

P(word 2/ class A) = wordcount / ni(A)

P(word2 / class B) = wordcount / ni(B)

P(wordn / class B)=wordcount / ni(B)

5.Avoid zero frequency problems by applying uniform distribution.

6.Classify a new document C based on the probability p(C /W).

a)Find P(A /W)=P(A) *P(word1/ class A) * P(word2/class A)……*P(wordn / class A).

b)Find P(B /W)=P(B) *P(word1/ class B) * P(word2/class B)……*P(wordn / class B).

7.Assign document to class that has higher probability.

III.2 Time Series Algorithm

A time series represents a collection of values obtained from sequential measurements over time. Time series data mining stems from the desired to reify our natural ability to visualize the shape of data. In fig 5.shows the time series the prediction is based on the historical data.

A time series algorithm represents a collection of values obtained from sequential measurements over time. Time series data mining stems from the desired to reify our natural ability to visualize the shape of data. In time series the prediction is based on the historical data.

Example

Calculated Percent Over Last Year

This method multiplies sales data from the previous year by a factor calculated by the system.

Required sales history: One year for calculating the forecast plus the user specified number of time periods for evaluating forecast performance .

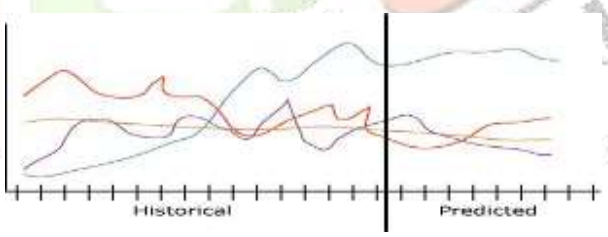

Fig 5. Time series predicted data

IV.LITERATURE REVIEW

Yu Hong et al. (2010) [4] compares four data mining techniques - logistic regression (LR), decision tree (C4.5), support vector machine (SVM) and neural networks (NN) on the basis of efficiency by applying them to two data sets of credits. The results show that the LR and SVM techniques produce the best classification accuracy, and the SVM shows the higher robustness as compared to other algorithms. On the other hand, the neural network (NN) technique performs relatively poor. its classification accuracy is unstable.

Peiying Wang (2010) [5] discusses both objective and subjective reasons for increasing women crimes in China. The prime reasons are the overall negligence of women's survival and education, her development and economic rights, and women's own ignorance and disregard of their rights. The characteristics and causes of female crimes in China are analyzed first and then appropriate strategies have been proposed with the aim to reduce female crimes.

Gupta Anish et al. (2012) [11] have explained the meaning of data mining and its process, scope and various techniques of it. The author has also discussed various security concerns of data mining and its security aspects and measures related with the databases for data mining. The security measures are very important for its applications. It has been suggested that a security measure should be implemented on behalf of the company policies.

Huang Shin-Chen et al. (2013) [6] conduct a comparative analysis on the accuracy of data mining classification techniques namely, support vector machine, decision tree, neural network and logistic regression for credit check in banking and reduce the credit risk. The support vector machine model has higher accuracy rates and therefore outperforms other classification methods in the context of credit risk in banking.

Shah Chintan et al. (2013) [7] have used three different data mining classification algorithms for prediction of breast cancer namely decision tree, Naïve bayes, and K-Nearest Neighbor with the help of WEKA (Waikato Environment for Knowledge Analysis),which is a open source software. Different parameters have been compared for prediction of cancer. But, for superior prediction, accuracy and lowest computing time have been focused. It has been concluded that Naïve Bayes is a superior algorithm compared to the two others because it takes the lowest computing time and at the same time provides highest accuracy.

Uppal Veepu et al. (2013) [10] describes the method to solve the problems faced in library because of the huge growth of library data and to improve the quality of managerial decisions. In this paper, various data mining techniques have been used that are helpful in predicting the allocation of books in library , need of the department , analysis of book circulation by time series and pattern identification of inventory loss. The main motive is that book occurrences in frequent sequences, layout of books should be arranged such that readers can easily find the books.

Bansal Divya et al. (2013) [3] has elaborated the use of association rule mining for extracting patterns within a dataset. The implementation of Apriori algorithm on a dataset containing crimes against women has been shown. For this, WEKA tool has been used for extracting results. A comparison analysis between Apriori and Predictive Apriori Algorithm has been done. The Apriori Algorithm is more efficient than Predictive Apriori Algorithm.

Ngaruiya Njeri et al. (2015) [2] uses two promising data mining tools (R Environment and WEKA) to derive patterns in Prostate Cancer. A tool has been built for identification of the Gleason score. It helps in deciding the treatment technique for Prostate Cancer. The WEKA and R Algorithm used gives almost the same results but the R Algorithm is an easier tool to learn and its representation of data is much efficient and easy to read. The patterns achieved will assist the GOK (Government of Kenya) for correctly placing the cancer diagnosis and treatment equipment which were launched by the National Government of Kenya in early 2015.

Ram Shrawan et al. (2015) [12] have done a comparative study and evaluation of decision tree and Artificial Neural Network with the help of Statlog Heart Diseases Database collected from UCI machine learning repository. These algorithms have been compared on the basis of classification accuracy and performance matrices.

Objective and Methodology

1 Objective: To study and compare some of the promising data mining algorithms for analyzing and predict the crimes against women.

2 Methodology: The tentative process followed during the course of Research Project: (as shown in Figure 1)

Step 1: Understanding the algorithms.

Step 2: Implementing a first draft of the algorithm step by step.

Step 3: Testing with the input files.

Step 4: Cleaning the code.

Step 5: Optimizing the code.

Step 6: Comparison of the performance with other algorithms.

V.IMPLEMENTATION AND RESULTS

The implementation of the three promising data mining techniques namely, Decision Tree, Naïve Bayes and Time Series Algorithm has been shown using Visual Studio 2010. The implementation has been carried out using Windows Operating system on a PC with Intel® Core CPU running at 2.00 GHz, with 4 GB of RAM. Below Figures shows the working of Naïve Bayes and Time Series Algorithm in Command Window of Visual Studio 2010. The predicted results cannot be assured of 100% accuracy but the results shows that our application helps in reducing crime rate to a certain extent by providing security in crime sensitive areas. So for building such a powerful crime analytics tool we have to collect crime records and evaluate it.

Fig 6.Upcoming of state DELHI of Crime KIDNAPPING and ABDUCTION362.8625

Fig 7.Upcoming of State CHANDIGARH of Crime DOWERYDEATHS45375

Fig 8.Upcoming of state HARYANA of Crime ASSAULTON WOMEN WITH INTENT TO TOUCH OUTRAGE HERMODESTY 537.7300

VI.PROBLEM FORMULATION

Crime against women is an alarming public issue not only in India but in the worldwide too. There has been a massive increase the crime rate against women. There is need for accurate and timely information to react to women crime such as identifying the age group of those who are mostly involved in crime, relation of the accused with victim, whether accused is stranger or known to the victim etc. can be of immense help. By analyzing previous similar crime cases, we can identify the criminal or his attributes such as age group, relation etc. in new crime cases.

Analysis can be made regarding which age group of girls are the main target of criminals. Apart from this, there is need to recognize public areas specially the dark areas which have high probability of crime rate so that suitable steps can be taken to prevent the same. Such information can be helpful for the Government, society and police to suggest measures to be taken towards creating a peaceful society. It will also help in the appalling situation of women in society. Thus, a comparative study of Data classification algorithms has been implemented for predict the crime against women.

VII.FUTURE SCOPE

Given databases of huge size and quality, data mining technology provides new opportunities in the research field.

1 Automation in prediction of behavior and trends

Data mining automates the process of finding information in large databases. Traditionally methods of data mining required extensive analysis by humans' hands and with data mining it has become direct to answer the predictions. An example of the same is targeted marketing where it uses data of past promotional mailing system to identify the customers who will probably maximize the return on investment in future mailings. Other examples include insurance analysis for prediction and decision making, income tax department of government for fraud discovery.

2 Automated discovery of previously unknown patterns

Data mining tools sweep through databases and identify hidden information in them. An example of pattern discovery is to identify items that are often purchased together from sales data. Other examples include detecting fraudulent credit card transactions. Data mining techniques can also be implemented on new systems as well as on existing platforms. Data mining tools can analyze massive databases in minutes. Larger databases, in turn, yield improved predictions.

VIII.CONCLUSION

In this paper we have tested the accuracy of classification and prediction based on different test sets. Classification is done based on the Bayes theorem and Time Series algorithm which showed more than 90% accuracy. Using this algorithm we trained numerous news articles and build a model. For testing we are inputting some test data into the model which shows better results. The pattern is used for building a model for decision tree. Corresponding to each place we build a model by training on these frequent patterns. Crime patterns cannot be static since patterns change over time. By training means we are teaching the system based on some particular inputs. So the system automatically learns the changing patterns in crime by examining the crime patterns. Also the crime

factors change over time. By sifting through the crime data we have to identify new factors that lead to crime. Since we are considering only some limited factors full accuracy cannot be achieved. For getting better results in prediction we have to find more crime attributes of places instead of fixing certain attributes. Till now we trained our system using certain attributes but we are planning to include more factors to improve accuracy.

Our software predicts crime prone regions in India on a particular day. It will be more accurate if we consider a particular state/region. Also another problem is that we are not predicting the time in which the crime is happening. Since time is an important factor in crime we have to predict not only the crime prone regions but also the proper time.

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ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

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Published in	:	Volume 6 | Issue 2 | April 2018
Page No	:	804-810
Published URL	:	http://www.ijcrt.org/viewfull.php?&p_id=IJCRT1812331
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