Online ISSN : 2395-602X
Print ISSN : 2395-6011
www.ijsrst.com

NATIONAL CONFERENCE ON TRENDS & TECHNOLOGIES IN MULTI-DISCIPLINARY RESEARCH NCTTMDR-2021

Organised by
A2Z EdulearningHub,
Kuthukallinkal, Thodupuzha,
Cheenikuzhi P.O, Kerala, India

VOLUME 9, ISSUE 3, MARCH-APRIL-2021

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH IN SCIENCE AND TECHNOLOGY

Email : editor@ijsrst.com Website : http://ijsrst.com

National Conference on Trends & Technologies in Multi-Disciplinary Research
NCTTMDR-2021
20th March, 2021

In Association with

International Journal of Scientific Research in Science and Technology
Print ISSN: 2395-6011 Online ISSN : 2395-602X
Volume 9, Issue 3, March-April-2021
International Peer Reviewed, Open Access Journal

Organised by

A2Z EdulearningHub,Kuthukallinkal, Thodupuzha, Cheenikuzhi P.O, Kerala, India

Published By
Technoscience Academy

(The International Open Access Publisher)

website: www.technoscienceacademy.com

CONFERENCE PROCEEDINGS

Online National Conference on Trends & Technologies in Multi-Disciplinary Research (NCTTMDR-2021)

20th March 2021

Organized by

A2Z EduLearningHub
in association with
International Journal of Scientific Research in Science and Technology (IJSRST)

Introduction-

Online- National Conference on Trends & Technologies in Multi-Disciplinary Research (NCTTMDR-2021) on 20th March 2021

A2Z EduLearningHub organizes a National Conference on Trends & Technologies in Multi-Disciplinary Research (NCTTMDR-2021) in association with the International Journal of Scientific Research in Science and Technology (IJSRST) on 20th March 2021. This conference is a meeting place for sharing ideas, discoveries and inventions with their peers and experts, online. The Conference will help academicians, research scholars, UG & PG students to provide them with the knowledge on recent trends and innovations in Commerce, Engineering and Management disciplines.

Simultaneously, the conference aims at capacity building, developing and assisting emerging researchers to promote Social Responsibility and work in the Nongovernmental Sector for sustainable development project.

With Regards!
Team
NCTTMDR-2021

MESSAGE

Mr. Praveenkumar K S, Director, A2Z EduLearningHub
(Assistant Professor & Head, Dept. of Computer Applications, SNGIST ASC, Kerala)

Since March 2020, Covid has been a threat for our social life. It prevents the traditional ways of education and face to face instruction. Teachers and students are physically isolated, so that interaction is not possible. It is against this background A2ZEduLearningHub thought of an online conference. We decided to provide an opportunity for the researchers and like-minded people to assemble virtually, when all physical meetings are being suspended. We have only one objective here; that is, for academicians, researchers scholars, UG and PG students, to share their ideas, discoveries and inventions, with their peers and experts online. Definitely this type of paper presentation and this type of meeting will be a part of our carer in the coming days. Now in the world, especially in India academicians, professionals, students are getting familiar with the new method of teaching and learning.

This Conference, particularly meeting young researchers from different parts of the world, has given me a lot of hope for a brighter future in a post-Covid era. A good piece of responsible research would unearth the issues deep-rooted in the society, analyse them, evaluate the results through a prism of differing perspectives and provide recommendations that would be beneficial to society. The point that interests me most is that it would help policymakers frame policies that positively impact the people and the community.

Thank you all for your contributions, and I look forward to reading more of your works in the future and seeing you at future conferences.

With Regards!

Mr. Praveenkumar K S

MESSAGE

Dr. K.S. Divakaran Nair
Regional Director (former), IGNOU, Kochi

The objective of research is to create new knowledge or new interpretations of existing knowledge. Research should be a continuous process. The growth and development of a nation totally depend on its research initiatives. The investment on research is never a fruitless effort. The developed nations are competing one another in increasing their share of expenditure in the annual budget, for research. The National education Policy 2020 of Government of India has recommended for allocating more investment in Research and Development.

The present on-line conference on multidisciplinary research organised by A2Z EduLearningHub is timely and congratulatory, in which a good number of papers are presented by the researchers and experts in the field. By providing a platform, I understand that the organisers are encouraging and enabling the young and budding researchers from different parts of the country to undertake research to face the challenges and find solutions for problems faced by society.

This conference proceedings that A2Z EduLearningHub publishes, is a valuable record of all the papers presented. I hope this collection of papers would be accepted and appreciated by researchers, research supervisors and the students. I congratulate A2Z EduLearningHub for organising such a unique online conference and also publishing the proceedings for the cause of research and dissemination.

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Regards!
Dr. K.S. Divakaran Nair

MESSAGE

Dr. Deva Brinda
Professor (former) , SRM University

This on-line conference organised by A2Z EduLearningHub is really praiseworthy in the context of Covid pandemic in India and all over the world. This effort brings the researchers and research scholars together to a live platform for showcasing their findings in multi-disciplines. I take this opportunity to congratulate the presenters of papers, participants of the webinar and especially, A2Z EduLearningHub for publishing the collection of papers.

As a researcher with long years of experience in my field and as a power engineer, I am happy to present a concept paper, on which further investigations are necessary.

Smart grid, the computer controlled generation-transmission-distribution system, is an emerging requirement for sustainable development. India too, is not an exception in this technological advancement, which otherwise demands research and development on the nuances of an effectively functioning smart grid in the country. Whatever be the systems, in the form of micro grid or macro-grid, new and new experimentations are highly needed for filling-in knowledge gaps with further research. Smart grid is an umbrella concept under which there are several sub-issues, like: Clean energy, Green energy, Convergence of power systems, Non-conventional power generation, Storage of power, Power for sustainable development etc. are vibrant. Big data analysis is another area of research that has unending limit.

I appreciate the presenters of papers and A2Z EduLearningHub for involving in the services of: production of knowledge and distribution of knowledge for the nation, in multi-disciplines. I wish this conference proceedings could become a valuable reference material for the researchers and students.

With Regards!
Dr. Deva Brinda

CHAIR'S MESSAGE

Dr. Meenakshi Sharma
Professor, RNB Global University, Rajasthan

First of all I congratulate the presenters of the papers and A2Z EduLearningHub for realising this on-line conference. Though the conference is for the presentation of papers from multi-disciplines, this room is for the presenters from the disciplines: Commerce and Management Studies.

In this section we expect papers with more innovativeness and relevance, for which the presenters had taken much care and interest. I understand that there are papers titled: i) Water management as upcoming business opportunity, ii) Educational platform on the outbreak of Covid, iii) Technology trends in banking sector, and iv) Impact of Covid on industrial sector. No doubt, these papers would catch the attention of the presenters, as well as the participants.

I am happy to know that A2Z EduLearningHub is bringing about the proceedings of this conference for the use of researchers, research scholars and students. Let the conference presentations and the dissemination be a great success!

With Regards !

Dr. Meenakshi Sharma

CHAIR'S MESSAGE

Dr Bincy Baby
Assistant Professor, St.Peter's College, Kerala

Each and every Conference aims to put forward new knowledge and theories for the benefit of society. NCTTMDR-2021 conference was to provide a forum for disseminating knowledge and information in the area of different disciplines. Students and faculties from several colleges presented papers in the conference. They presented various papers in Commerce and Management. All of them made effort for the insightful presentation. Exactly it was an inspirational event for all the participants. Special congratulations to all the participants for their contributions. Almost all the papers were sound qualified for publication in the International Journal of Scientific Research in Science and Technology.

With Regards !
Dr Bincy Baby

CHAIR'S MESSAGE

Dr. Shince V Joseph
Assistant Professor, Madanappalle Institute of Technology & Science Andhra Pradesh

The use of data to understand phenomena and evaluate designs and interventions in different disciplines is increasingly evident. As a result, engineers and other applied scientists frequently find themselves needing to collaborate in multidisciplinary fields when carrying out research to remain innovative. Multidisciplinary research is an investigation or inquiry to a problem for ascertaining the hypothesis combining many academic approaches, fields or methods. National Conference on Trends & Technologies in Multi-Disciplinary Research held on March 20, 2021 is a platform to spread and share the knowledge among young and dynamic talents across the country. It was a great honour to be a part of the programme as technical chair. I would like to thank you for the invitation and impressively organised and executed conference.

With Regards !
Dr. Shince V Joseph

CHAIR'S MESSAGE

(Dr). Resmi K R
Assistant Professor, Santhigiri College, Kerala

Every person has thoughts and ideas that can lead to the creation of new products and services. The aim of the NCTTMDR-2021 conference is to give academicians and researchers a place to share their ideas in multidisciplinary research. Students and faculties from various colleges presented papers in the conference. Presenters presented various relevant and advanced topics in computer science. All presenters took good effort for effective presentation. Special congratulations to students who took initiative to present the papers. Selected reviewed papers will be considered for publication in the International Journal of Scientific Research in Science and Technology.

With Regards !
(Dr). Resmi K R

CHAIR'S MESSAGE

Dr. Gakwaya Nkundimana Joel
Assistant Professor,Lowry Memorial College,Benguluru

I am delighted in acknowledging and mentioning that the National Conference on Trends and Technologies in Multi-Disciplinary Research (NCTTMDR-2021) as the best and the outstanding ever organized online conference. The presenters and participants had focused on the current lifestyle dependency on technologies and the users' pro and cons face daily life related to findings on current scenario. NCTTMDR-2021 blend of research and practice and as can be seen from the articles of the participants. The chairs' committee accepted papers and presentations, from those papers which meet the criteria of the conference. The review process was manually done and feedback automated using any means convenient to the participant.

I would like to thank all co-chairs' conference for their thorough and time reviews of the submissions, which enabled the rigorous selection of a very strong papers

I appreciate the organizing committee for showing a keen interest in organizing a successful conference and contributing new ideas and research findings. I wish them for the endeavors to spread knowledge

The conference got great support from the A2Z EdulearningHub in association with IJSRST in the presence of DR. K J James General Chair,NCTTMDR and Mr. Praveenkumar K.S Director, A2Z EduLearningHub LLP

With Regards !

Dr. Gakwaya Nkundimana Joel

CHAIR'S MESSAGE

Dr. K.J. James , General chair of the conference
(HoD , SNGIST Group of Institutions, Kerala)

A2Z EduLearningHub might have thought of an off-line mode for the presentation of research papers to be published in this proceedings. Covid-19 pandemic tarnished that dream, but they were not wasting time, against which an on-line conference was the way-out. Every academic and researcher must congratulate A2Z EduLeraningHub and the writers of the papers for their interest and enthusiasm that they expressed in this adverse circumstances.

These papers are from multi-disciplines, namely, Commerce, Management Studies, Science, Technology and Engineering, and the presenters are from different states of India. What makes me happier is that, a good number of presenters are young and vibrant scholars who begin their noble carrier as researchers in their field. Still, they could think in terms of innovativeness and relevance. It makes me proud of reading the papers on most needed themes, including: Big data analysis, Internet of things, E-payment and Human resource management.

I firmly believe that hundreds of researchers, research scholars, post-graduate students and teachers would be attracted to use the proceedings for different research purposes, or least they would keep this as a good reference material. Thus the writers of the papers would be honoured again and again.

With Regards!
Dr. K.J. James

Co-CHAIR'S MESSAGE

(Dr). Pramod K
Associate Professor, SNGIST Group of Institutions, Kerala

The conference on Trends & Technologies in Multi-Disciplinary Research organised by Edu Learning Hub on 20th March 2021 was really touch the most awakening research area of Commerce, Engineering, Management and Technologies. The presenters from various research discipline delivered their views which is relevant to the current pandemic situation. Many of the scholars thinking how their research work will turn into get a solution for the current real-world problem which spread in every phase of the life. For example, a mathematical model proposed by a scholar provided the effective way to predicting the frequency of affecting the pandemic in a selected local area. The actual study was looks into a matter which is used for an analytical study related to finance.

Another example is related to an algorithm proposed for a purpose of developing a programme related to analyzing the occurrence of human errors in a micro controller hatchery. The research scholar proved that; the same algorithm concept can be utilized in the area of predicting the occurrence of spreading the pandemic. Similarly, many of the idea developed from the ongoing research works can be utilised in giving solutions for the situation where the society currently faces. The NTTMDR 2021 and its organizers did a remarkable job in the multi-disciplinary research, where the whole world is looking into get off the situation

Regards!
Pramod K

Co-CHAIR'S MESSAGE

(Dr). Dhinu Lal.M, (Former Assistant Professor, UKFCET, Kerala)
PhD Research Scholar, VIT Vellore

It is a great pleasure to welcome you all to the online National Conference on "Trends & Technologies in Multi – Disciplinary Research" (NCTTMDR – 2021) organized by 'A2Z EdulearningHub' in association with "International Journal of Scientific Research in Science and Technology" (IJSRST). NCTTMDR provide a platform to academicians, researchers, NGO', government authorities and policy makers to meet, discuss and propose technologies in commerce, management and engineering. The presenters in the room which I co-chaired was from commerce and management.

The papers entitled i) Locus of Control of Individual Investors: A Segmentation Approach, ii) Green Process Innovations and Green Product Innovations: An Environmental Management Strategy and its Growth Phases in the Manufacturing Sector and iii) A Study on E-commerce Payment trends during Corona Virus pandemic in Bhopal City shows originality in the concept, scope, and presentation. These papers are more relevant in this era, and there is no doubt that these works will benefit both the research community and society. As A2Z EdulearningHub publishes the proceedings of this virtual conference, it will be of great assistance to aspiring researchers conducting literature reviews. I anticipate more research-related initiatives from A2Z EdulearningHub in the future.

As co-chair of this virtual conference, I would like to thank all of the participants who presented their valuable research works, as well as A2Z EduLearningHub and its organizers for organizing a very well virtual conference. Also, many thanks to the editorial team of the International Journal of Scientific Research in Science and Technology for their assistance in publishing the papers.

Regards !

Dhinu Lal M

Co-CHAIR'S MESSAGE

Mr.Joyal Paul
Assistant Professor, SNGIST Group of Institutions, Kerala

Knowledge gaining is an essential part of growth. Research is a tool for achieving the knowledge we seek for finding solutions to the problems in everyday life. Besides that, a mind with determination and passion is a necessity for a successful outcome.

I, firstly, appreciate A2ZEduLearninhHub for all the hard work and diligent effort put into completing the online national conference. All the participants were from the computer science discipline with novel and innovative topics. The topic selection and presentation style of every participant was remarkable. I am sure that this kind of programme will help students and research scholars in gaining knowledge and confidence in research completion. I also wish everyone that your efforts become a success.

Regards!
Joyel Paul

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Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Locus of Control of Individual Investors : A Segmentation Approach

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Research Scholar, School of Management and Entrepreneurship, Kerala University of Fisheries and Ocean studies, Panangad, Kochi, Kerala, India

ABSTRACT

Investment plays a vital role in a developing country such as India, as it provides the necessary funds for undertaking productive activities to be circulated in the economy. Savings are our country's largest source of investment. Investments are subject to the individual's attitudes, beliefs and perceptions. As a result, the attitudes and expectations of investors have a major impact on their investment behaviour. Locus of Control is one of the most important factors that affect individual's decision-making behaviour. Locus of Control is people's assumptions about what causes their lives to have good and bad outcomes (Rotter, 1966). It is said that there is internal and external LOC. Individuals with internal LOC assume they control their own destiny, whereas individuals with external LOC relate their experiences to destiny, luck or chance. Consequently, LOC has a great influence on an individual's investment decision-making behaviour. As a result, this study attempts to assess the LOC of an individual and segment the investors based on their level of internal and external LOC.

Keywords: Locus of control, Individual investor, Segmentation of investors.

I. INTRODUCTION

"Developing an internal locus of control helps you to build resilience and enables you to deal with the stuff life throws at you." - Joanna Frankham

Locus of control is the present-day idiom for the notion of internal versus external control of reinforcement which has evolved from the Rotter's [1] social learning theory. It was originally developed by Julian B. Rotter in the 1950's. Locus of control is an inner feeling that people possess regarding the extent to which they are proficient of making their own decisions and viewing the outcomes as coming from those decisions [2]. The word locus has derived from Latin meaning location or place. If an individual believes that he/she is in control of their lives, there exists locus internally. If an individual believes that fate, luck, other people, environment or higher authority control their lives, there exists locus externally. Locus of control is a personality variable, which has its roots in the social learning theory developed by Rotter in 1954 [3]. Social learning theory integrates learning theory with personality theory, which is one of the seminal works on clinical psychology. The premise of the theory is that a person's actions are anticipated on the basis of the person's expectations of reinforcement, the perceived value of the reinforcement, and the circumstances in which the person finds himself or herself [4].

Rotter's motivating factor was the empirical law of effect. People are encouraged to seek out constructive stimuli, or reinforcement, and to resist negative stimulus, according to the law of effect. Rotter combined behaviourism and personality research without relying on physiological drives or impulses as a motivating force. Julian Rotter's social learning theory's core premise is that personality is the product of an individual's interaction with his or her environment. Rotter assumes that personality, and therefore behaviour, is still malleable. Adjust the way a person feels or the environment in which they are reacting, and their actions can change. Furthermore, during the 1960s, when the behaviourist approach was competing with the growing emphasis on cognitive psychology, the locus of control concept was developed as a way for social learning theorists to combine behavioural and cognitive theories [5]. They used locus of control to explain how certain control cognitions influence behaviour change. Around the same time, psychologists were turning their attention away from definitions of stable personality traits and toward behaviour modification. One idea that sought to overcome this void was locus of control, which used a human trait to model behaviour change [6].

Social learning theory developed by Rotter has basically, 3 constructs to predict behaviour. They are; behavioural potential, expectancy and reinforcement value [1]. The probability of any behaviour resulting in a given situation is determined by the individual's expectation that the behaviour will secure the available reinforcement, as well as the importance of the available reinforcement for that person [7]. Reinforcement boots the likelihood that a specific behaviour or occurrence will be accompanied by reinforcement in future [8]. Expectancy is equivalent to the value of the reinforcement [9]. Expectancy entails that the person regard the result, possess self-efficacy, comprehend and believe the reward system, and eliminate unfavourable outcomes [10]. The chance of engaging in a particular behaviour in a given situation is known as behaviour potential. In other terms, what is the likelihood that a person will behave in a certain way in a given circumstance? In any given scenario, one may engage in a variety of behaviours. There is a behaviour potential for every possible behaviour. As a result, the function of all these 3 constructs, helps us in the measurement and prediction of behaviour.

Since the introduction of locus of control theory, there has been enormous hike in research applying locus of control concept, and it has picked up widely in psychological as well as other fields of research ever since then [11]. The present study attempts to access the locus of control of individual investors, so as to segment them into diverse clusters with different characteristics.

II. METHODS AND MATERIAL

The study is based on the primary data collected from the working class residing in Kerala i.e,12,49,343 workers [12]. Using Raosoft1991 [13] sample size calculator a sample size of 97 has been arrived having a confidence level of 95%. This has been rounded off to 100 for the ease of calculation. The data was collected using well structured questionnaire, out of the 125 questionnaires distributed during the period, January 20th to 30th, 2020, 100 (80%) questionnaires were found completed and were used for the analysis.

The questionnaire for the study explores the demographic characteristics and LOC of individuals. Rotter's LOC Scale was used for measuring the LOC of respondents. The questionnaire's content validity was checked by a panel of experts.

The survey instrument showed a Cronbach's alpha value of 0.806. This shows that the questionnaire used and the sample size are reliable and adequate [14].

The locus of control data showed a kurtosis of 0.096 and skewness of 0.042, which are well within the normally accepted standards of ±1.96 [15]. The

histogram and normal Q-Q plots also indicated that the data is normal.

III. RESULTS AND DISCUSSION

A. Demographic profile of Individual Investors

Analysis of the demographic profile of the respondents revealed that 76% of the respondents were of the age group 19-40 i.e., young adults while only 24% were in the age group of 41-60 i.e., adults. Out of the 100 respondents, 48 respondents were female and 52 respondents were male. Out of the respondents, 18% were under graduates, 45% were post-graduates and 37% had professional degrees.

B. Locus of Control

Rotter's [8] Locus of Control is a personality variable, which has been widely studies over the centuries within different and diverse fields [9] & [16]. It explains a person's generalised expectancies about what influences their life events. People who believe that they themselves control their life events are known as internals and those who believe it is dependent on luck, fate and other people are known as externals. Most of the people exhibit both internal and external traits in different life situations.

1) Internal Locus of Control: The locus of control of individuals were accessed through the Rotter's LOC scale. It contained 20 statements- 13 statements relating to internal LOC and 7 relating to external LOC. The mean of the internal LOC statements is given in the table below.

Table 2. Internal Locus of Control Statements

Statements	Mean
People's misfortunes result from the mistakes they make.	3.07
In the long run people get the respect they deserve in this world.	3.15
It's one's experiences in life which determine what they are in life.	3.51
I have often found out what is going to happen will happen.	3.02
Trusting fate has never turned out as well for me as making a decision to take a definite course of action.	2.93
Becoming a success is a matter of hard work; luck has little or nothing to do with it.	2.98
Getting a good job depends mainly on being in the right place at the right time.	3.36
When I make plans, I am almost certain that I can make them work.	3.30
It is impossible for me to believe that chance or luck plays an important role in my life.	2.85
Usually, when I plan to do something, I can carry it out.	3.33
In general, I think about a decision before taking action.	3.35
It is better to save up for something and buy it only when you have the money to pay.	3.00
Being in debt shows that you cannot manage yours finances properly.	2.71

Source: Primary data

Since most of the mean values in the above table is more than 3 and only four values are below it, but not so low, it can be inferred that the individual investors in Kerala have more internal locus of control. They believe in their own judgement and rely on hard work rather than luck and faith. It can be seen that the impact of locus of control on debt management is only moderate.

Table 3. Internal Locus of Control of Individual Investors.

Internal LOC	Percentage
Low	2
Medium	95
High	3

Total	100

Source: Primary data

Table 3. indicates that majority (95% + 3%) of the individual investors have medium to high level of internal locus of control i.e., they believe in their own capabilities rather than the external environment. These medium to high internal LOC individuals portray the quality of self- efficacy in their behaviour, as a result they are highly self- motivated to achieve their goals. Only 2% of investors have low internal LOC, and hence they need to be externally motivated to achieve the desired results.

2) External Locus of Control: The seven statements relating to external locus of control revealed a mean value as shown in the table 4.

Table 4. External Locus of Control Statements

Statements	Mean
Many of the unhappy things in people's life are partly due to bad luck.	3.46
To improve standard of living unfortunately, an individual's worth passes unrecognized no matter how hard he tries.	3.31
Heredity plays a major role in determining one's personality.	2.88
It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.	2.87
Many times, I feel that I have little influence over the things that happen to me.	2.96
The best laid plans often go astray.	3.18
Being in debt shows that you cannot manage your finances properly.	3.22

Source: Primary data

Among the external locus of control statements (7), there statements have a mean value below 3 and the rest of the statements do not have very high values, which indicates that the individual investors, does not have much reliance on their faith and luck. They mainly focus on their hard work to achieve their goals and objectives.

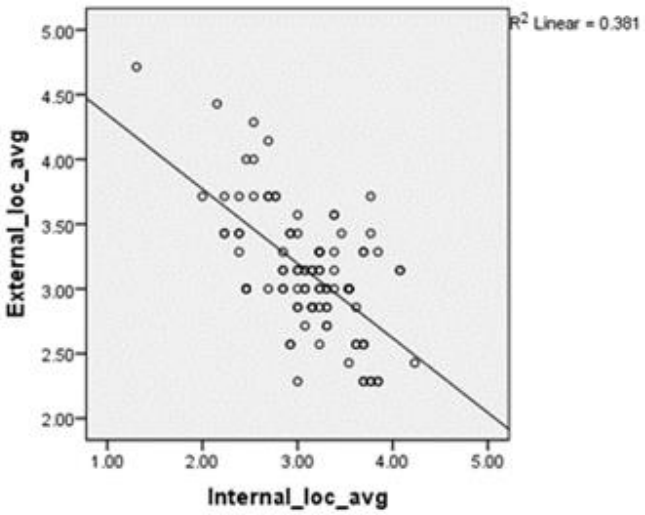
Table 5. External Locus of Control of Individual Investors

External LOC	Percentage
Low	9
Medium	87
High	4
Total	100

Source: Primary data

The above table indicates that majority (87%) of the individuals neither or nor belief in external forces. Only 4% strongly believe that the external environment has an influence on their life events and 9% have considerably low external locus of control. As a result, it can be seen that the individual investors have more internal LOC and less external LOC.

3) Relationship between Internal and External LOC: In order to determine whether the internal and external locus of control, exhibited significant correlation, Pearson's correlation coefficient was used. On analysis it was seen that the correlation between internal and external locus of control was significant at 0.01 level of significance and generated a correlation coefficient -0.617. This indicates that the internal and external LOC are not independent of each other, both these traits are present in an individual investor but at varying levels. Figure 3. Depicts the relationship between the internal and external loci of control with a linear trend line.



Source: Primary data

Figure 3. Relationship between internal and external LOC

C. Investor Segmentation

Investor segmentation is the rule of the day. It refers to the process of classifying individual investors into different subgroups based on their personality traits. Several studies have been conducted in this field of research by categorizing investors into various subgroups based on their; level of knowledge, allocation strategies and personality [17],[18],[19],[20],[21] & [22]. The present study tries to segment investors based on their locus of control. As we have already noted investors have varying levels of internal and external locus of control. Based on this, we proceed with our segmentation process using cluster analysis. Cluster analysis classifies individuals or objects, on asset of researcher selected characteristics. The clusters so formed will exhibit high internal (within- cluster) homogeneity and high external(between-cluster) heterogeneity [23]. In order to determine the number of clusters to be formed, the study applies hierarchical cluster analysis in the initial stage. After applying hierarchical cluster analysis, it was found that the investors can be classified into 3 clusters.

After determining the final cluster numbers, K-means clustering technique was used to segment the investors into 3 clusters, namely- Internals, Externals and Moderates based on their level of internal and external LOC traits. The final cluster centres of internal and external LOC for the three cluster are shown in Table 6.

Table 6. Individual Investor Segmentation

	Cluster 1 (Internals)	**Cluster 2 (Externals)**	**Cluster 3 (Moderates)**
External LOC	2.78	3.80	3.10
Internal LOC	3.63	2.39	3.05
Number of individual investors	34	19	47

Source: Primary data

1) Investor Clusters:

Cluster 1: **Internals**

Internals as the name suggests, they portray higher internal LOC traits than external LOC traits. They are individuals who believe in themselves and their capabilities. They are self-motivated and have the trait of self- efficacy in them. They do not rely on external support or belief to do their work. They believe that they can control their own destiny and life events. In the present study, 34 % of individuals are internals i.e., they believe in themselves rather than the external environment.

Cluster 2: **Externals**

Externals as the name indicates, they portray higher external LOC traits than internal LOC traits. They are individuals who rely on their external environment for everything in their life. They need to be externally motivated to get to their goals. They lack self- confidence and self- belief. In the present study, 19% of individuals belong to externals i.e., they rely

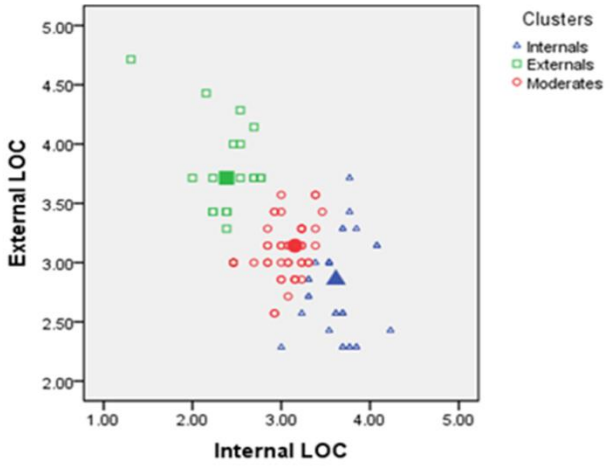
on their external environment such as faith, luck and destiny.

Cluster 3: **Moderates**

Moderates are individuals who exhibit both internal and external LOC traits. They try to moderate their life events between their self-beliefs and the beliefs of the external environment. They work hard and make their own destiny, at the same time they believe in luck, and faith. In the present study, majority of the individuals (47%) are moderates i.e., they have both the qualities of internals and externals.

2) Validation of Segmentation:

Discriminant analysis is used in the following section to profile and validate the cluster solutions formed on the basis of locus of control. Under discriminant analysis, when there are three clusters, two discriminant functions are formed. In this case the first function relates to external LOC and second function relate to internal LOC. The figure 4. Clearly indicates that the classification based on LOC is suitable and distinct cluster have been formed.



Source: Primary data

Figure 5. Investor Clusters

Table 7. Tests of Equality of Group Means

	Wilks' Lambda	F	df 1	df2	Sig.
External LOC	.438	62.306	2	97	.000
Internal LOC	.270	130.861	2	97	.000

Source: Primary data

Table 8. Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	Df	Sig.
1 through 2	.191	159.664	4	.000
2	.961	3.887	1	.049

Source: Primary data

The test of equality of group means also revealed significance (Table 7), which indicates that there is significant differences in the clusters formed. The group correlations were 0.022 and the Box's M test (sig.= 0.003) also states that there is multivariate normality in the clusters formed or their covariances are significantly different. All this indicate that the profiling done on the bases of locus of control is correct. Wilk's Lambda showed significance for the test of function 1 through 2 (Table 8), which indicates that the discriminant function formed has good prediction capabilities. The classification results also indicate that 96 % of the classification is correct.

IV. CONCLUSION

Locus of control portrays the inner attitude of an individual. This study tries to access the locus of control of individuals and segment them into various clusters. The data collected for the study revealed that most of the individuals in Kerala had more internal LOC compared to external LOC, i.e., they believed in themselves and their hard work rather than on fate, luck and other external factors. It was also seen that there existed a high relationship between internal and external LOC i.e., they do not exist independently, instead the study revealed that a person has both

internal and external LOC at varying levels. The study used LOC construct to segment individuals into 3 clusters; namely internals, externals and moderates. It was seen that most of the individuals in Kerala were moderates i.e., they exhibited both the qualities of internals and externals. Their traits varied according to different situations. The clusters so formed where tested for their suitability and validity using discriminant analysis and the classification was found to be correct and apt. Thus, the Kerala society has a mixture of LOC clusters, but mostly they are moderates who try to suffice situations rather than to take extreme decisions.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Green Process Innovations and Green Product Innovations: An Environmental Management Strategy and Its Growth Phases in the Manufacturing Sector

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ABSTRACT

A company faces several strategic options when it responds to environmental issues (Banerjee, 2002). Green practices have gained in popularity for manufacturers in the hopes of mitigating their environmental damages while achieving performance gains (Cronin, Smith, Gleim, Ramirez and Martinez, 2011; Qi et al., 2010). Adoption of environmental management (referred to as EM hereafter) activity depends on different strategies and objectives of the firm (Hart, 1995; Porter and Linde, 1995; Darnall, Henriques and Sadorsky, 2008). In the words of Cramer (1998), Montabon, Sroufe and Narasimhan (2007), EM is the activities that directly aim to protect the environment, or the techniques, policies and procedures used explicitly by a firm to monitor and control the impact of its operations on the natural environment. Since different "best practices" of management lead to different kinds of competitive advantage, it is essential to focus on specific "best practices" that reduce firms' negative impact on the natural environment. Hence the paper primarily focuses on examining the changing phases incorporate environmental management strategies and the role of green product innovations and green process innovations for sustainable development.

Keywords: Green process innovations, Green product innovations, Environmental management, Environmental management strategy, Manufacturing sector.

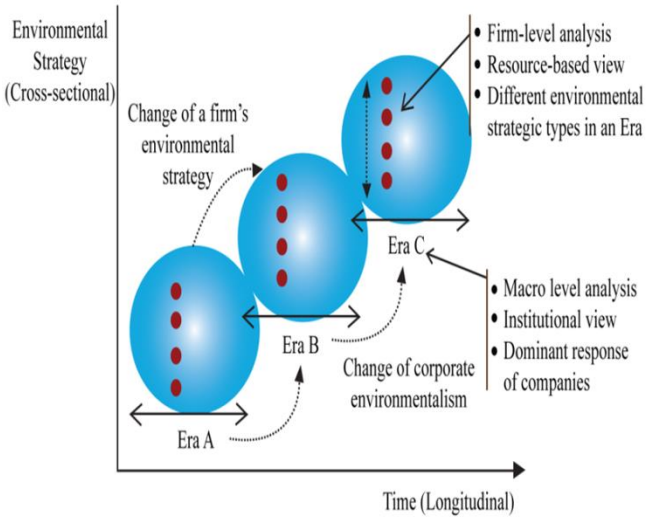
I. INTRODUCTION

Jimenez, Gil and Lorente (2001) stated that EM might be considered a competitive priority for manufacturing because it satisfies two basic requirements- obtaining within the production scope and creating a competitive advantage. Under the "environmental concept," industries will design, plan and produce non-polluting or low-polluting products. Hence "environmental management" to the original operation management has been regarded as "the fifth management" for businesses (Jennings and Zandbergen, 1995). Gallego Alvarez, Ortas, Vicente Villardon and Alvarez Etxeberria (2017) argued that environmental strategies are getting modified to become compatible with the characteristics of the social and institutional

environment. Economic activity produces a steady degradation of the environment, increasing firms' pressure to "green" their operations and becoming responsible through environmental management practices (Henriques and Sadorsky, 1999). Firms that apply ecological management avoid the hassle of protests or penalties regarding environmental protection, improve their corporate image, develop new markets and increase their competitive advantages (Presley, Meade and Sarkis, 2007). So environmental strategy is becoming increasingly prevalent, and firms adopt a broad strategy that incorporates the demands of multiple stakeholder groups to improve the natural environment.

II. THE CHANGING PHASES IN CORPORATE ENVIRONMENTAL MANAGEMENT STRATEGIES

Firms use various types of environmental strategies. Since there is an increase in firms' environmental consciousness, the environmental practice strategy will satisfy the growing green market (Gilley, Worrell, Davidson and Jelly, 2000). Jawahar and McLauglin (2001) argue that an organisation uses different strategies to deal with multiple stakeholders, and these strategies may change over time. In short, the literature review suggests that the environmental management strategies of organisations are changing. A firm's selection of the environmental management strategy depends on the width and depth of environmental-friendly practices. The range of decision areas where environmental issues have been taken into account and the degree of environmental adaptation is referred to as the width of the activities. The depth of the environmental strategy represents how deeply environmental issues have been integrated into a firm's strategy, operational activities and employees work routines. Lee and Rhee (2007) propose a framework to explain the strategic environmental change by integrating the institutional change at a macro-level analysis and resource-based argument in a firm-level analysis as shown in Fig. 2.1



(Source: Lee and Rhee, 2007)

Fig. 2.1: Framework on the Change in Corporate Environmental Strategy

Fig. 2.1 explains the framework of change in corporate environmental strategy based on two dimensions. They are

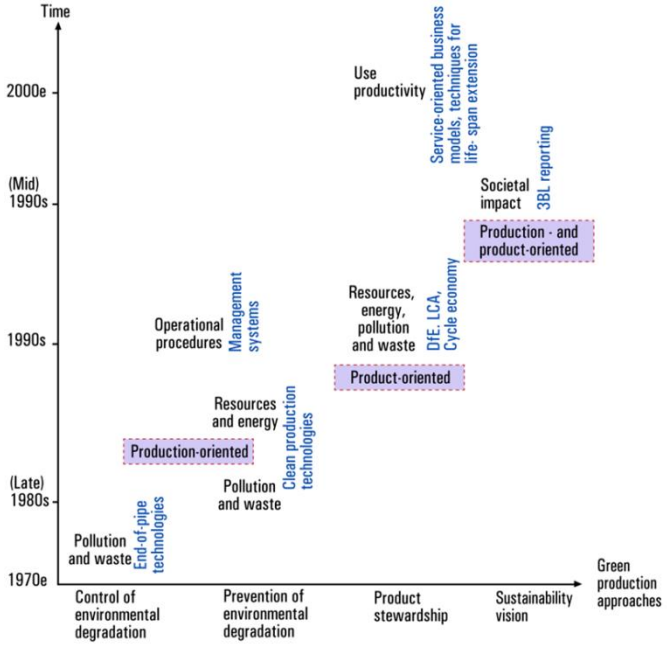
1. **The Environmental Strategy**: A firm can choose different types of environmental methods. Lee and Rhee (2005) explained that companies show different ecological approaches in a certain period depending on internal corporate factors such as resources, capabilities, management attitude, and organizational culture and EM experiences.
2. **The Time Dimension:** A firm can change its strategic environmental type as time goes on. There are two kinds of change in environmental strategy, according to the level of analysis. First is based on the change of corporate environmentalism on the macro level, which shapes the different eras or periods that shift from one era to another. The second is due to the change of an individual firm's environmental strategy. Although firms tend to evolve through waves of commonly accepted trends by mimicking each other, they

also have the discretion to operate within the institutional constraints surrounding them.

III. GREEN PRODUCT INNOVATIONS AND GREEN PROCESS INNOVATIONS AS BEST ENVIRONMENTAL MANAGEMENT STRATEGIES

Due to the increasingly prominent environmental problems and excessive consumption of resources, firms should implement green production to effectively reduce environmental risks and their negative consequences in the whole production process. Przychodzen and Przychodzen (2015) noted that green production adds environmental ideas to the product life cycle. The work on green processes includes machines that reduce air emissions, minimise waste, save water and energy, ensure the health and safety of production workers, customers and the local community (Ball, Evans, Levers and Ellison, 2009). Firms can implement green process innovations (referred to as GRPSI) in the manufacturing process to shorten production times and achieve the goal of reduced costs (Lambertini and Mantovani, 2009). Negny, Belaud, Robles, Reyes and Ferrer (2012) described that eco-process innovation decreases unit costs of production, modifies the organisation's operational processes and systems, produces significantly improved or new eco-products and reduces environmental impacts.

The key features of an innovative green product have characterised by the use of materials (such as reduce, recycled, recyclable, less polluting, non-polluting and non-toxic), energy use, human toxicity, ecological impact and sustainability issues at every stage of its life cycle (Groot and Boren, 2010; Chiou et al.,2011). Green product innovations (referred to as GRPDI hereafter) is an activity of information processing (Kong, Feng and Ye, 2016). Its market success mainly concerns meeting customer needs and preferences better than competitors (Land, Engelen and Brettel, 2012). The green product's characteristics are communicated externally through eco-labelling (Albino et al., 2009). Baines, Brown, Benedettini and Ball (2012) attempted to plot the evolution of the scope and focus of green production as depicted in Fig. 2.2



(Source: Baines et al., 2012)

Fig. 2.2: Evolution of Green Product through Green Process

Fig. 2.2 shows that green products have evolved through the various phases of the green process as follows.

i. Pollution Control

Pollution control has adopted since the 1970s based on the use of "end-of-pipe" solutions to ensure proper disposal of waste to reduce the release of pollutants after it has generated (Hart, 1997; Sarkis and Cordeiro, 2001; Sangwan, 2006; Rusinko, 2007; Dills and Stone, 2007; Vachon, 2007). Traditionally, green production has focused on pollution prevention and pollution control technologies.

ii. Pollution Prevention

During the 1980s, the emphasis moved to pollution prevention approaches (Hart, 1995) and known as "clean technologies," which are more proactive as they aim to eliminate pollution, waste and the source. Besides, efficient use of energy and materials such as

process, equipment modification, material substitution, modularisation (Porter and Van der Linde, 1995; Mohanty and Deshmukh, 1998; Sarkis and Cordeiro, 2001; Sangwan, 2006; Rusinko, 2007; Vachon, 2007). Even though more significant investments are required, benefits increase in the long term (Hart, 1995; Sarkis and Cordeiro, 2001).

iii. Product Stewardship

Pollution prevention and control blurred during the 1990s when pollution control and prevention were re-integrated (Vachon, 2007). The practice of product stewardship was introduced in the 1990s and entailed a more in-depth and more inclusive approach to green management. Adoption of techniques such as Design for the Environment (DFE) (Hart, 1995, 1997; Stead and Stead, 2000), Green Supply Chain Management (GSCM) (Hart, 1995; Corbett and Klassen, 2006; Srivastava, 2007; Lee and Klassen, 2008; Beamon, 2008), Life Cycle Assessment (LCA) (Hart, 1995; Srivastava, 2007; Lee, 2008) are also part of the same.

iv. Sustainable Development

By the mid-1990s, manufacturing companies had started to embrace the sustainability agenda (Kleindorfer, Singhal and Van Wassenhove, 2005; Saha and Darnton, 2005; Stead and Stead, 2000). Hart (1995, 1997), before others (Stead and Stead, 2000), has recognised that both pollution prevention and product stewardship practices support sustainability. However, the organisation is consciously directed towards improving the competitiveness of delivering EP (Rusinko, 2007). Various standards have evolved to reinforce this linkage, such as the International Organisation for Standardisation 9001, which emphasises quality improvements to reduce waste. ISO 14000 deals specifically with EM and Occupational Health and Safety Assessment Series (OHSAS) 18000 promotes healthier, safer and more environmentally friendly working environments.

Kurapatskie and Darnall (2013) highlight that companies develop new green products and processes and enjoy more benefits than companies who modify existing products and processes. GRPDI concerns product design, quality and reliability concerning environmental issues, while GRPSI concerns innovation in operations, sourcing and logistics processes, reduce resource consumption and emissions (Chang, 2011). GRPSI reduces costs by driving resource efficiency, while GRPDI creates profits by selling green products at a premium price (Christmann, 2000). Hence the above reviews analyse that GRPSI and GRPDI are essential to a firm's excellence in internal and external aspects.

IV. PERFORMANCE IMPACTS OF GREEN PROCESS AND GREEN PRODUCT INNOVATION PRACTICES

An organisation adopts GRPSI and GRPDI as an important way to respond to environmental protection, thereby obtaining sustainable competitive advantages but not as a source of the additional cost. Christmann (2000) argued that investment in either GRPSI or GRPDI could significantly improve performance outcomes. Based on the review of studies, it was found that there are various performance impacts.

EMP leads to higher profit margins through GRPSI, and GRPDI is emphasised by a wide set of studies (Lee, Kim and Choi, 2012). An environmental strategy might present firms with a broad set of opportunities and paths to achieve and sustain green-based competitive advantages (Aragon-Correa and Sharma, 2003). Increased process innovation contributes to operational performance by reducing production costs, improving current production processes, productivity and efficiency (Fritsch and Meschede, 2001). Hence there has been an increasing need to apply the proactive approach of EM in the

business community by balancing environmental, economic and social performance as part of society's responsibility (Guerci, Longoni and Luzzini, 2016).

V. CONCLUSION

With the emergence of industrial growth, the manufacturing industry's consumption of natural resources has immensely increased (Abbas, 2020). The energy shortage, environmental pollution and customer's growing awareness of environmentally friendly products drive the firms to concern EM (Taoketao, Feng, Song and Nie, 2018; Wang, Feng, Zhao and Song, 2018). Studies reveal that innovation results in response to environmental requirements (Porter, 1991; Porter and Linde, 1995) or rising consumer and corporate environmentalism (Chen, 2011). However, higher profitability and cost efficiency may drive a proactive way (Rennings and Rammer, 2009). Hence green innovation focused on process and product realise a win-win solution for economic development and environmental protection due to its various positive performance impacts.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Augmented Reality in Education

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ABSTRACT

The present study explores the concept of Augmented Reality(AR) with special reference to its implications in the education sector. With Augmented Reality catching off well, one can see its applications in different fields like social media platforms,(Eg: Instagram, YouCam, Makeup etc.) gaming platforms or even in shopping. However, the same has not been explored in full in the education sector. The paper discusses the enormous possibilities of AR in education field, how it can be used to improve the teaching learning and the overall skillset of the students. A brief introduction to understand the concept of Augmented Reality is given. The study uses the analogy of 3D movies and its influence on students to suggest breakthroughs in education using the concept. Some of the important and relevant AR apps and their benefits are also discussed. The impact and future possibilities of AR are also discussed.

Keywords: Augmented Reality, Data Science, Artificial Intelligence

I. INTRODUCTION

Augmented Reality is one of the recent data science trends. We can see the applications of augmented reality everywhere. Augmented Reality is the ability of a human or a user to see the real world at the same time as virtual to the real locations. Augmented Reality or in short AR enhance the real-world experience of our location. The application of Augmented Reality can see in many applications like Instagram, YouCam Makeup, etc. which we have been using on our mobile phones. AR is often used in gaming, bringing a more realistic experience to users and engaging more senses. AR is also helpful in the shopping experience as well. One of the common Google applications is "Google Lens", where we can understand what you are looking at and use that information to copy or translate text, identify plants and animals, explore locations or menus, discover products, find visually similar images, and take other useful actions. Ie, Google lens lets you search what you see. Using a photo, your camera, or almost any image, the lens helps you discover visually similar images and related content, gathering results from all over the internet. Like this in education also the application of AR applies a potential impact and that potential in education is just beginning to be explored. The learning methodologies like classroom lectures with textbooks, computers, handheld devices, and other electronic appliances are getting outdated now. The choice of learning innovation is dependent on an individual's access to various technologies and the

infrastructure environment of a person's surroundings. In a rapidly changing society where there is a great deal of available information and knowledge, adopting and applying information at the right time and right place is needed to the main efficiency in both school and business settings. While AR offers new learning opportunities, it also creates new challenges for educators. A student who is doing their studies needs some skills like critical thinking, problem-solving, accessing and analyzing information, curiosity, and imagination about each and every topic that they learn. A student who learns things along with an AR learning environment could not only help to enhance those skills but also the learning methodology could be effective.

II. EDUCATION THROUGH ANIMATION, MULTIMEDIA AND 3-D

Traditionally the teaching-learning methodology was using textbooks, reference textbooks from the library. When the technology has been developing rapidly, the behaviour of learning using textbooks and library books had changed or shrank to E-books, PowerPoint presentations, etc. even the teachers have been using the PowerPoint presentation while lecturing when every institution becomes ICT enabled. Later, the focus of every teacher in preparing an animated PowerPoint presentation to make the lecturing easy, attractive, and interesting. Not only the animation but also the inclusion of multimedia in the PowerPoint presentation. All these help students to gain more attention and sometimes it triggers a student to stay awake during a lecture. Moreover, it has been suggested that with the use of animation in education, there is a significant increase in the attitudes and academic achievements of the students in a positive way.

The impact of animation as a multimedia tool is at the forefront of visualization systems. This leads to the new concept of blended learning in educational institutions. It may be used to enhance the traditional lecture with additional readings, electronic instructor notes, and images of charts, graphs, or other handouts in one course. Technology is seen as being possibly useful in supporting face-to-face teaching, enabling students to interact with learning material. Every human being loves to watch videos on YouTube, Television, Radio, etc. It is mainly because we love to get pieces of information without reading anything. Actually, we are used to it now. It also helps us to increase our attention, understanding, retention, etc even though the concentration-time of every human is only 20minutes. We never knew that we have been watching a particular video or audio for more than 20 minutes.

In many of the education institution still follows blended learning methodology. But in no time the there will be a transition from blended learning to the concept of 3D learning. In many schools mainly primary schools, they have been using 3D learning methodology for teaching some concepts of their syllabus say, the concept of the solar system, digestive system, photosynthesis process, etc. There is some fantastic piece of stereo 3D software called Eureka.in to provide unparalleled 3D learning. Even though it is designed with the teacher in mind, it enables students to fully explore content in real-time.

A. AUGMENTED REALITY(AR) IN CLASSROOMS

Integrating 3D models and educational augmented reality into the curriculum allows students across the world to experience a more immersive, diverse, and interactive education. With classrooms shut down and social distancing in place, AR education will play a positive role in helping students comprehend classroom educational content. AR can also aid in-class demonstrations, presentations, or activities while social distancing is in place. AR makes educational content fun and accessible. Schools need to align educational augmented reality experiences in their school curriculum, to enhance school learning. There are many benefits that students experience from educational augmented reality

- Increased content understanding
- Learning Language associations
- Long-term memory retentions
- Improved physical task performance
- Improved collaboration
- Increased student motivation

B. WHY BIJU'S APP MAKES A DIFFERENCE IN EDUCATIONAL SYSTEM?

One of the leading learning applications is Biju's Learning App. what makes Biju's App different?

Why they are blending videos, interactive, and teachers for bringing concepts of life?

Why they are developing a new section of self-paced as well as active learners where the students are encouraged to gain knowledge by themselves, made possible by the providing of content, media, and technology?

Why they are using educational games for young kids?

The company has recently taken an early initiative in this direction by acquiring a firm that brings them a small team that specializes in Artificial Intelligence. Under the leadership of Osmo's, a Palo Alto-based company, hoping for a promising AI future where the firm can even experiment with Augmented Reality to observe how these technologies can be inculcated onto the BYJU'S app for making learning more useful for the end result student.

And the content creation process in Byju's app is highly based on the data analytics at work since a lot of data and insights are generated in-house.

For instance, If a sizable section of students is committing errors in a specific concept, Byju's can go back and affix easier videos, additional content formats, and simpler questions to enable the system to develop a smoother learning curve. The students end up grasping the difficult areas of the concept but they absorb it slowly and without getting discouraged, The variety of student profiles also gives the company a plan on what can be improved or added to the overall content, they gather information from the app as the primary data, with logged-in web usage to add to it, for enhancing the user experience. The interactions of the user with websites, emails, etc are kept track of by a separate system that is used for enhancing marketing automation as well as customer behavior analysis.

III. RESULTS AND DISCUSSION

Many AR apps are available in the market. However, these applications are focused on school children. This is because for grounding the imagination power of school children with the competencies and knowledge required to collaborate with others and get ahead in careers of the future. A major drawback that might occur is laziness in reading. Ie, When they grow they feel lazier to read. So Augmented books can help to traverse a tricky textbook with detailed diagrams, enrich an art book, action into a comic book or even gaze into a tide pool. You can also use augmented reality to help readers explore wayfinding and metadata about books in a public library.

These kind of Augmented reading applications for kids(Especially age 5 to 7) are available like Starfall Learn to Read which is available for both IOS and Android, Homer, Bob Books, Hooked on Phonics, Reading Eggs which is also available for both IOS and Android, Reading Raven, etc. These applications are doing the same procedure as the case study. Ie, we usually give a case study of a particular theme to our students and will tell them to read the case study and answer the following queries. And later in class, we will discuss the topic interactively through students' inputs as well. Here is one of the Augmented reading apps "Aurasma" need to photograph each page of the text, students must read and discussed the text before noting the questions, using Explain Everything they recorded themselves, reading the story and highlighting the text, they also asked questions, they saved it as a video and used "Aurasma"(One of the Industry-Leading Augmented reality Apps for Education (Available for Android / iOS) to link the

video to the book, making the book interactive and more enjoyable for KS1 to read.

One of the flaws with this app is photographing of each page. These apps are best for short story books since they are designed for small kids.

Similarly, there is an application "AUG THAT" is an Augmented Reality Educational Company, developed by educators with over 18 years of experience within the public school system. In 2013 the company began with a Tutoring Center which infused technology to students as well as provided rigorous differentiated instruction to children throughout Monmouth County, New Jersey. AugThat began creating and developing their own technologies as well as a curriculum that enhanced the learning process. AugThat has developed an application that infuses Augmented Reality into real-world learning. Our app delivers 3D models, 360-degree virtual environments, and activity sheets with animated lessons – all presented via smart devices.

5 more AR apps that needed to include in our educational system as well as follows

- **Aurasma** :- One of the Industry-Leading Augmented reality Apps for Education (Available for Android / iOS)
- **Spacecraft 3D** :- One of the NASA's Augmented Reality Apps for Education (Available for Android / iOS)
- **AR Flashcards:-** One of the Kids-Learning Augmented Reality Apps for Education (Available for Android / iOS)
- **Augment** :- One of the Educators-Friendly Augmented Reality Apps for Education (Available for Android / iOS)
- **YeppAR** :- One of the General-Purpose Augmented Reality Apps for Education (Available for Android / iOS)

Even though our India is digitalized, Why India is not attempting to use AR in all educational Institutions?

A. **Cultural Diversity:** For a country as diverse as India — in terms of social, economic, linguistic, and cultural conditions—like India, making a uniform and standardised AR-enabled school curriculum is difficult. Unless private firms bring the costs down and make content more region-specific, state governments will not give adequate subsidy in the purchase and distribution of learning material, or bring AR support to schools.

B. **Learning Capacity Variance:** Despite the fact that AR is made to be self-learning with comprehensive guidelines for first-time learners, not all students have the same learning capacity or grasping potential. Therefore, adequate educator training is also very important in AR.

C. **Financial Constraints:** State-run schools far outnumber private schools in India. The majority of these schools have severe financial constraints, so public-private partnerships can help these schools to re-establish themselves to become part of the new revolution in the teaching-learning process.

D. **Lack of Technical Know-How**: AR/VR isn't simple or intuitive for first timers. There are regions in India where computer skills are missing among teachers and students. So VR developers should keep in mind about tech illiterate population for VR to truly shine in education circle.

E. **Shallow or Inadequate Learning Content**: While VR content developers have more recently gained prominence, most learning content is not deep enough to have an impact or borders on the cartoonish or childish. It's hard to create the diversity of content required for all kinds of learners. And most founders believe it will take a long time to bring relevant VR content for all use-cases.

In play store there are so many AR apps are available for classes 8th to 10th, JEE, NEET, etc. Many private institutions have their own AR apps. Being digitalized in India, it would be better if the Government spent an amount on these kinds of AR apps for both school and college students in our Educational Institutions.

IV. METHODS AND FINDINGS WITH LIMITED RESOURCES

Since there are no computer science-oriented AR apps that are freely available in the play store, the methodology of this research is studied using simple Google AR apps which are built-in on our mobile phones as applications or widgets such as Google Lens, Google Assistant and ARLOOPA from play store for teaching some concepts of AR on the courses concerned. The mode of study is based on three levels of knowledge (understand, apply and analyse) and involved the integration of video, audio, and text information. The most highlighted feedback from students after the class were

- With the physical task performance, the individuals get motivated to listen
- Eagerly waiting to learn more with more memory retention.

A. Findings

- Google Assistant is used instead of Alexa for showing the speech recognition and playing or doing some tasks. So students get to know more about Google Assistant and thus they could analyse and compare the usage of Alexa as well.
- Google Lens is used for the purpose of language translations, google search, identifying plants and animals, shopping, etc.
- ARLOOPA is an Augmented Reality app which has the options for illustrating the AR concepts from different disciplines like education, entertainment, Science and Technologies, Fashion, Food, Furniture and Home, Food, Industrial, Architectural, Humanoid, Virtual Tours, Animals etc.

With these limited Google AR apps, even without investing any money, students get to know more about the concept of AR and some freely available applications.

Beyond the AR apps in education, one of the popular social media platforms is Instagram are recently implemented with AR filters by picking up some new tricks with the latest update to Facebook's Spark AR platform. The new AR Music feature allows developers to create filters that interact with music, be that tunes that are uploaded directly, selected from Instagram's music selection tool or just audio that's playing in the background. It's a pretty logical step for Instagram, bringing equalizer-style visual effects into filters and pushing users to bring music and AR into their Stories simultaneously. Bringing gallery selection tools to Instagram's filters allow users to spin new AR effects on previously captured photos or video. With Media Library, one can easily grab an old photo or video and toss a filter on it, with Gallery Picker, users can transform a visual filter with media from their gallery, allowing for a level of customization that could promote more consistent usage of singular filters among users.

V. CONCLUSION

Educational AR and 3D modeling is a proven interactive method to teach school curriculum and increase students engagement and retention. Integrating AR into classrooms and educational systems proves to be significant in helping students comprehend educational curriculum. Now is the time to optimize digital learning, thru augmented reality, due to the COVID19 pandemic and social distancing. AR and 3D modeling are emerging as the creative way to enjoy, visualize, and conceptualize curriculum.There is no limit to your imagination and learning with AR. As augmented reality technology integrates into mainstream society this innovative technology will lead the next generation of students into ingenious learning and maximize optimization.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Credit Card Fraud Detection Using Data Mining

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ABSTRACT

These days, everyone utilizes online administrations for selling or purchasing something. The principle objective of this advancement innovation is to diminish the utilization of actual cash. At this situation, the online deceitful exercises are expanding quickly. Among this, charge card fake exercises arrived at its zenith. To defeat the present situation, distinctive Data Mining strategies can be utilized. These strategies incorporate genetic algorithm, KNN calculation and neural organization. This paper center around the various variants of Master Card frauds and the successful just as effective information mining procedures through Data mining.

Keywords : Credit Card Frauds, Data Mining, Genetic Algorithm, Neural Network, KNN algorithm

I. INTRODUCTION

The progression and advancement in innovation has opened a few new entryways for submitting fake demonstrations. These acts power certifiable danger to associations on the monetary, operational and mental measurements. Despite the financial hardships, extortion can marvelously influence the association's notoriety, selflessness and customer relations. Subsequently, associations endeavor to execute an arrangement of strategies to distinguish and forestall misrepresentation. Among those methods is Data mining.

Master card Fraud is probably the greatest threat to business affiliations today. Nevertheless, to overwhelm the misrepresentation successfully, it is basic to at first understand the systems of executing a misrepresentation for instance we need to fathom the procedures of digital Credit card fakes. Since earlier the extortion is distinguished just when the charging for MasterCard is done, it is hard to hinder fake exchanges. In this way the need to ensure unexposed exchanges for Mastercard owners while using their charge cards to make electronic instalments for items and undertakings gave on the web is a worldview. This examination paper investigates a segment of the information digging methods used for Visa extortion identification. Prior to delving into the subtleties, a short portrayal of extortion and information mining is familiarize to make room.

II. DATA MINING

Data mining alludes to eliminating important data from colossal proportions of data. Numerous people treat data mining as an identical word for another noticeably used term, knowledge discovery from data, or KDD, while others see data mining as a fundamental advance during the interaction of information disclosure.

The knowledge discovery from data in data mining carries out through seven steps:

1. **Data cleaning:** This is the initial step to remove noise data and unessential data from gathered raw data.
2. **Data integration:** At this step, different data sources are consolidated into important and valuable data.
3. **Data Selection:** Here, data relevant to the analysis are recovered from different sources.
4. **Data transformation:** In this progression, data is changed over or combined into required forms for mining by performing diverse tasks, for example, smoothing, normalization or aggregation.
5. **Data Mining:** At this progression, different shrewd techniques and tools are connected so as to extricate data pattern or principles.
6. **Pattern evaluation:** At this progression, Attractive patterns representing knowledge are distinguished dependent on given measures.
7. **Knowledge representation:** This is the last stage in which, perception and knowledge representation procedures are utilized to assist users to understand and translate the data mining knowledge or result

III. CREDIT CARD FRAUDS

The credit card frauds can be classified as 2 categories, online frauds and Offline frauds. From frauds it varies as follows;

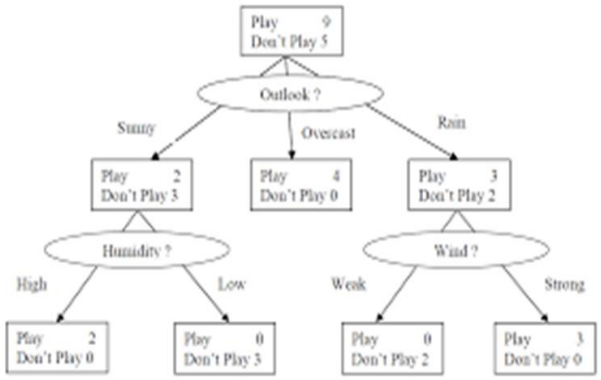
- **Stolen Card:** The fraud has the physical card through robbery or by lost. He can misuse for any other purpose which may lead to a mental and financial ruin to the victim.
- **ID theft:** When an attacker collects confidential details about the victim, like date of birth, gender, email id, he can access into a new account of the victim. Most of the credit card frauds constitute this type.
- **Fake cards:** Card which isn't approved or not gave by monetary foundations is named as phony cards. Counterfeit cards are created by skimming the real data of veritable card which was swiped over an EDC machine. This data is encoded from the attractive strips and later used to make counterfeit cards.
- **CNP frauds:** Card not present extortion is a kind of misrepresentation where the criminal requires insignificant data, for example, card number and expiry date. In such circumstance, the card need not be available while making the buys on the web.

IV. DATA MINING TECHNIQUES FOR CREDIT CARD FRAUD DETECTION

In data mining there are different strategies for recognizing the credit card frauds. In this Survey paper we talk about some most accommodating techniques.

- Decision Tree
- Neural Network
- K-Nearest neighbor algorithm
- Hidden Markov Model
- Genetic Algorithm

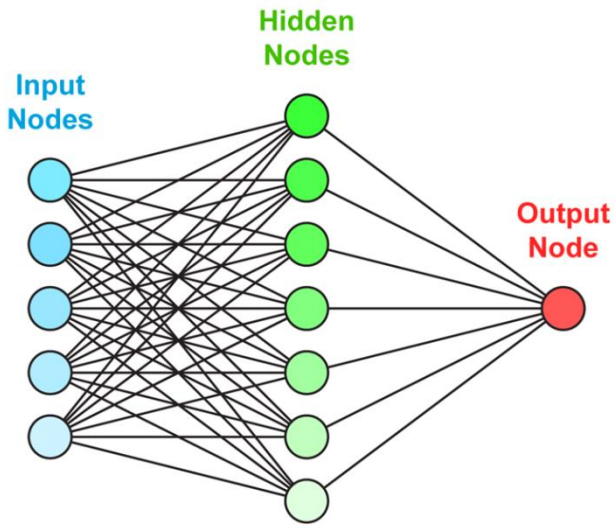
1. Decision tree



A Data mining acknowledgment strategy that recursively passes on a great deal of records is Decision Tree Algorithm. This is a strategy used for dealing with relapse and grouping issues. It used the

tree portrayal. It contains one root hub, youngster hubs and leaf hubs. Trait names are utilized to named the ascribes. Estimations of traits are used to check the edges. For anticipate a sign of a class the following strategy is used. In the first place, it begins from the root hub then it looks at the expense of the root and record hub esteem. With this result it seeks after the division relating to that cost and headed out to the accompanying hub. This technique is gone before until it shows up the leaf hub with expected class esteem. It is not difficult to execute, perceive and show when contrasting and other characterization calculation. It is moreover used for following the mail and IP address for recognizing credit card extortion. The identification depends upon the area. It looks at the area of going before utilization of with the current spots exchange.

2. Neural Network



Misrepresentation location using neural network is totally established on the human brain working head. Neural network innovation has made a PC prepared to think. As human psyche learn through past association and use its data or involvement with making the decision in regular daily existence issue a comparable procedure is applied with the Mastercard misrepresentation location innovation. Right when a explicit client uses its charge card, There is a fix design of Visa use, made by the way in which client uses its Visa. At the point when Mastercard is being used by unapproved customer, the neural network based extortion identification system check for the example used by the fraudster and matches with the example of the approved card holder on which the neural network has been readied, if the example matches the neural network broadcast the approve exchange. Exactly when an exchange shows up for approval, it is portrayed by a surge of approval information handle that pass on information recognizing the cardholder (account number) what's more, attributes of the exchange (e.g., sum, shipper code). There are additional information handle that can be taken in a feed from the approval system (e.g., season of day). The neural network is configuration to deliver yield in genuine qualities some place in the scope of 0 and 1 .If the neural network produce yield that is under .6 or .7 then the exchange is okay and if the yield is more than .7 then the probability of being an exchange illicit increment. In the design of neural network-based example acknowledgment Systems, there is reliably a methodology of business History descriptors contain features depicting the use of the card. For exchanges, the installments made to the record over Some speedily prior time break. Other a couple of descriptors can Include such factors as the date of issue (or most recent issue) of the Mastercard. This is basic for the recognition of NRI (non receipt of issue) extortion.

3. K-Nearest neighbour algorithm

K nearest neighbor is a basic algorithm that stores every accessible case and groups new cases dependent on a closeness measure (e.g., distance capacities). KNN has been utilized in factual assessment and design acknowledgment.

4. Hidden Markov Model

A bunch of states related with the likelihood conveyance is known as Hidden Markov Model. Each

and every state makes a yield according to the likelihood dispersion which relies upon the specific state. In this procedure yield can be noticeable to the customer just which is the reason it is called as Hidden Markov Model. In identifying shifty exchange of credit card, HMM uses the ways of managing money of cardholder. Spending example of the validated card customer is resolved by the past record of exchange which has the attributes like sum that has been traded, IP address, spot of conveyance and area of most recent exchange, etc. The conduct of the card holder is ordered into three kinds. They are,

1. Low spending behavior
2. Medium spending behavior
3. High spending behavior

Cardholders who pay low sum for purchase are characterized into conduct of low spending. The cardholder who spends reasonable component of sum are supposed to be the conduct of medium spending. In conclusion the cardholder who spends colossal sum is grouped into high spending conduct. The essential level is recognizing verification of the buyer that depends upon the buying examples of the cardholder. It seeks after two stage techniques to recognize the unlawful usage of charge card. Hidden Markov Model has been setup by using previous history of exchanges. It gets the info furthermore, approve whether the exchanges subtleties are recognized by past getting ready arrangement are assuredly not.

5. Genetic Algorithm

To get the improved ideal plan genetic algorithm is used. It is similarly used to distinguish the extortion exchanges with the given example informational indexes. This technique is capable and secure. It checks whether an exchange is verified or unauthenticated. Exchange using credit card has n number of characteristics. At beginning it pick the informational index that will be readied. By then we select the normalized information from the chose dataset that holds the entire knowledge concerning the cardholder. First it figures the basic qualities using consistency utilization of Mastercard check, present bank balance, charge card overdraft and spot where they use credit card for the particular exchange and typical consistently spending. Finally, it analyses the information and afterward decides if the exchange is verified.

V. CONCLUSION

We will probably investigate diverse information mining methods in a way that they assist us with recognizing and foresee the Visa extortion. Examination introduced by various analyst's shows that diverse information mining methods. Alongside these strategies "Hidden Markov Model" is improve the awesome answer for the extortion recognition.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Malayalam Handwritten Character Recognition-Approaches and Techniques

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ABSTRACT

In the present era of automation and development, Handwritten character recognition is one of the the major field of research in image processing and interpretation. Character Recognition that are handwritten which comes in the area of pattern recognition and Natural language processing has a wide range of utilization from handwritten document recovery and to use as a reading aid for blinds. The paper focuses on the different steps and techniques used for extracting and interpreting the handwritten characters of Malayalam Language, one of the complex languages in the world in terms of character specifications and multiple-style of writing characters. The paper is an attempt to compare and analyse the various approaches used to identify and interpret the Malayalam characters written in different styles both in compound, conjunct way as well as in isolated manner. These techniques convert a handwritten document or image into machine editable format so that it can be used for further digital processing and preservation forever.

Keywords: Handwritten Character Recognition (HCR), Malayalam, Pre-Processing, Feature Extraction, Classification, Neural Networks, Support Vector Machine (SVM)

I. INTRODUCTION

One of the prime importances of Handwritten Character Recognition is in Pattern Identification and Computer Vision by making the system learn through training. Data maintained in papers and in the form of physical documents are required to be digitalized so that it can be made used for digital content management and can gain more data security.

Character recognition can be performed in two ways- Online and Offline Recognition. Online Recognition involves real-time conversion of data using external devices such as a digitizer or PDA's where data is converted to machine encoded form at the same time when a user writes on it. In contrast, Offline Character recognition deals with inputs such as scanned images or documents which contain texts.

Offline Character Recognition again can be divided into two: - Optical Character Recognition and Handwritten Character Recognition. In Optical Character Recognition it involves mechanical conversion of typed or printed text present in documents or from subtitles superimposed on an image whereas Handwritten Character Recognition

refers to the conversion of handwritten notes and documents into machine editable form so that it can be used with text-processing tools. This paper is an attempt to study the scope and ultimate need for handwritten character recognition in Malayalam Language.

Major challenge faced in recognizing Malayalam Characters is due to the presence of rich character set that looks similar. Also, Malayalam Language not only consists of a number of alphabets, but also a wide range of syllables. Being the second most complicated language in the world, Malayalam characters still faces issues while measuring the accuracy of character recognition. Handwritten Character Recognition is well developed for languages like English, Chines, Urdu etc. The complexity arises in most of South Indian Languages like Tamil. Telugu, Kannada, Malayalam etc where characters appear in conjunct way and most of them an overlapping character. As compared to English Language with only 26 well defined letters in uppercase and lowercase, the accuracy kept in identification of Malayalam Characters is very low even since now.

OCR Systems can convert printed text in documents into machine readable form with almost 100% accuracy. But when it comes to handwritten based, the challenging factors are the wide variation of handwriting styles and existence of varying character features for each language where Malayalam Scripts mostly consists of curved features and in combined ways. The existence of old and new Malayalam Scripts (libhi) is another reason that causes difficulty in recognition.

II. METHODOLOGY

Handwritten Character Recognition is done in four major steps: - Pre-processing and Segmentation, Feature Extraction, Classification, and Post-processing. The accuracy in recognition mainly depends on the accuracy of selected method for performing Feature Extraction and Classification which makes them the most important phases in the system development.

A. PRE-PROCESSING

Apart from Feature Extraction and Classification, Pre-processing being the first phase, it plays a major role in the system as it makes the image ready to be extracted properly by removing unwanted content. This phase involves Noise Removal, Slant Estimation and Correction, Skew Detection, Normalization and making it suitable for Segmentation. Binarization helps to remove unwanted background area and edge detection and cropping. Finally, a thinned image of character is obtained which consists of its thickness within single pixels so that separation is easier for segmentation which includes line segmentation, word segmentation and character segmentation. The mostly used techniques are Histograms, Horizontal Projection Profile for line segmentation and Vertical Projection Profile for word and character isolation. It assigns a fixed threshold value and if there are any variations in projection which is somewhat similar to threshold value, it considers it as a word gap and if it is less than threshold value it is being treated as a gap that exist between characters and hence segmentation is done.

B. FEATURE EXTRACTION

At this phase various structural features are to be extracted that can uniquely identifies each and every Malayalam characters separately. Extraction is done by taking into account the difference in starting and end points of characters, its directions, loops, curves, overlaps, corners, terminals of characters, baseline height and descended height etc.

Some of the Feature Extraction Techniques include Principle Component Analysis (PCA), Linear Discriminate Analysis (LDA), Chain Code, Scale Invariant Feature Extraction, Zoning etc. In Chain Code method, Direction based analysis is done so that

character is traversed from start to end in one direction and by calculating its chain code reveals the character. Chain codes are used to represent boundary of character by using connected sequence of straight lines of specified length. It comes as 4-chain connectivity and 8-chain connectivity. In former, only four directional traversing is possible. But for Malayalam Characters 8-chain connectivity is required to analyse on diagonal based moves and the code follows the skeleton in anti-clockwise direction.

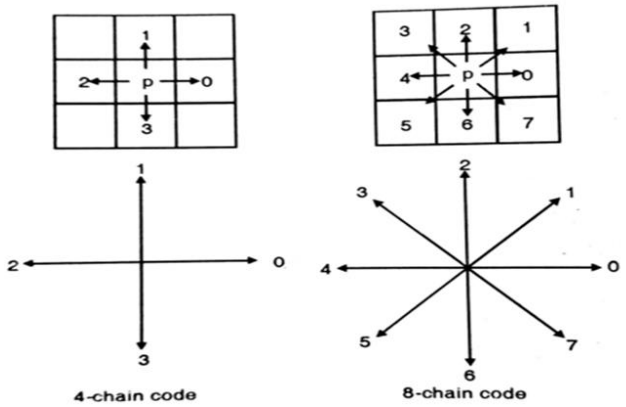

Figure 1: 4-chain and 8-chain connectivity [5]

C. CLASSIFICATION

Classification is the major area in recognition of Malayalam Characters. It categorizes the given characters into target classes or labels. The major techniques used are Support Vector Machine, Neural Networks, Decision Tree, Naïve Bayes etc. Artificial Neural Network uses consist of various processing units that resemble neurons of brain. Such units are known as nodes and each of them has a node function which processes the inputs i.e., the extracted features and give output label classes based on calculating the weight at each level. For each neuron a bias term is added along with the input data and is passed to next internal layer nodes where it is being multiplied with the weight. This process repeats until it is single enough to identify the character label.

The number of input layer depends on feature vectors and output layer depends on character classes. Artificial Neural Networks are used for Training and Testing Phases during classification. Information flows through Neural Network in two ways Bi-directional in training process and unidirectional in Testing Stage.

For a Neural Network to learn, a process of feedback is involved which is known as Back propagation. Here the output attained is compared with the expected results and the difference in outcome is recorded so that it modifies the already taken connection's weight by traversing it from output layer to hidden layer and then to input layer so that next time the system will reduce the chance of getting errors in classification of that character.

The system test and predicts the class using Feed forward Neural Network where each node receives input from its left nodes which are multiplied with the weights of connection they travel along and it add up all the inputs received and if it is closer to a certain threshold value that unit or node gets fired to the right most nodes next to it.

D. POST-PROCESSING

The outcome of classification will either be a correct or wrong prediction based on accuracy of learning through extracted features. At this stage the predicted class of character will be converted into a Unicode value that can be viewed by the user of the system. For certain Malayalam characters that do not have a Unicode have to be created manually and mapped with the character.

III. REVIEWS

The Authors of [1] proposes a system based on Regional Zoning. In the feature extraction process, extended zoning method is used where an image is divided as partitions known as zones and analysis is made for each partition. The derived features include length of characters in horizontal and vertical in each region which is done by row-wise and column-wise scanning of image, number of loops and intersections, direction of writing, number of endpoints etc. In their

work 9 structural features are extracted and the same sets of features are derived repeatedly for every regions of character. From each region r1, r2 etc, the number of endpoints and intersection points are calculated. 78.67% of accuracy is obtained from such 9 feature vectors.

In [2] the segmentation process is done briefly to score more accuracy in the upcoming phase of extraction. Here Projection Profile is used for line and word segmentation. Using the Threshold difference, white spaces between characters and words are interpreted. Touching characters are isolated by connected component labelling i.e., if more than two labels are present, each component is given a label as single characters where as if the component has only one label it is termed as touching character.

According to [3], the approach of using Dissimilar Classifier is used for Classification. Here instead of using multiple classifiers, entirely different algorithmic system is being taken. Feature Extraction includes SURF, Diagonal and Curvature Feature of characters. The Dissimilar Classifier used is Support Vector Machine (SVM) and Neural Network where the former takes SURF and Diagonal features as input vector and the latter takes Curvature feature as input. The challenge is that SVM learns faster but predicts slowly whereas Neural Network learns slow but predicts faster. The outcome from both these classifiers is combined to form better aggregate outcomes.

The proposed system by [4] uses Convolutional Neural Network (CNN) for recognizing present old script and then converting into editable new script format. They conducted the research environment by giving input images that has reduced noise so that major challenge is only in classification process. CNN is a Feed Forward Neural Network where individual neurons react to the restricted region known as receptive field and find overlapping receptive fields. This technique is preferred to minimize pre-processing tasks.

IV. CONCLUSION

This paper tries to present a detailed review and study of Malayalam Handwritten Character Recognition by comparing the techniques already used by so far. Still the issue is faced in correct recognition of characters due to lack of proper Feature Extraction and Classification techniques. The presence of rich character set with similar features and overlapping, compound characters written in different styles by different people are the major area of challenge faced in this project. Availability of proper dataset collected can also cause variations is outcomes of various proposed authors. The future works in Malayalam Handwritten Recognition can be done in terms if improving and modifying these techniques to get more accuracy with almost all characters in Malayalam

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

A Comparative Study of Different Machine Learning Models for Cyber Bullying Detection

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ABSTRACT

Cyber bullying generally involves harassing or threatening behaviour that an individual engages in repeatedly, This may following a person at a person's home or place of business. It also involves making harassing phone calls, leaving written messages or objects, It also include defacing a person's property. Although it has been an issue for many years, the recognition of its impact on young people has recently increased. With machine learning, we can detect language patterns used by bullies and construct rules to detect cyber bullying content. We used the labelled data, in conjunction with machine learning techniques to train a computer to recognize bullying content. In this paper, we have performed a comparative study among machine learning standard models like Linear regression (LR) and decision tree(DT).

Keywords : Machine Learning, Cyber bullying, Linear regression, Decision Tree

I. INTRODUCTION

The headway of web-based media has a significant part in the all-encompassing populace of adolescents on the web. They utilize such platforms mainly for communicating and entertainment. The new patterns are conveying feelings through web-based media. The client's life is open up in a large portion of the web-based media profile. Every little moment of life is exposed to social media. Hence this paper has taken from youtube. The examination technique we utilized for this exploration is encouraged by the accessibility of the public remark identified with them.

There are numerous security issues in web-based media like phishing, bullying, and so on. Phishing is also a social issue. The result of this sort of issue is leading to a ton of social and mental issues in young people. Bullying leads to many negative outcomes including impacts on mental health, substance use, and suicide. Through their post, this class of individuals communicates their emotions either as extraordinary gloom or outrageous annoyance, by thinking about notions in the inscriptions, hashtags utilized in the posts, and so on. The expanding pace of Indians to the web across India has a significant explanation behind the danger of tormenting. Young people are the most jeopardized casualties. So it is inevitable to control the bullying.

A new report has shown that cyberbullying among Indian kids is at the top on the planet. Bullies do not attack everyone. A lot of studies occurs related to bullying detection, avoidance, etc. Bulling principally centered on factors like individuals who post something which is firmly identified with strict

exercises, sexual uncovering, political exercises, etc. Detecting cyberbullying on social media is essential and is something that needs a lot of attention. So that children and our society are protected from its consequence. Detection and the provision of control cyberbullying are the main courses of action to combat cyberbullying. The detection can identify the presence of cyberbullying terms and classify bullying activities in social media such as Flaming, Harassment, Racism, and Terrorism.

In this study we are comparing three different machine learning classifiers namely Logistic Regression LR) Decision tree and Support Vector Machine (SVM) which can be used for the detection of cyber bullying comments. Here we used Natural Language Toolkit library in python for detection. Then we compare the performance in terms of accuracy, precision and we found that relatively, the SVM has a better of 75% precision.

II. METHODS AND MATERIAL

We analysed you tube profiles and its associated posts for bullying detection. This study data collection followed by filtering of relevant data, feature extraction, implementation and results.

A. Data Collection and Filtering

We are using youtube data for analysis and the data was collected. The extracted fields of a profile from youtube include the entire comments of the profile along with captions, hashtags, and comments related to each post. The biography has an important role in ease the filtering of data i.e., if bio contains words like quotes, awareness, motivation, etc. then we can avoid those profiles in the initial stage. These points were used to filter the public pages like motivation pages or awareness pages etc. We took the comments of each post and labeled them manually as either bullying or non-bullying. A total of 1070 comments were considered and of which 640 were nonbullying comments and the following are bullying ones. We divide the entire data set as training as well as test data and each contains 750 and 320 respectively. During each algorithm calls for every n-gram combination, we shuffle the dataset.

B. Related Works

Presently, there is a range of global initiatives aimed at preventing cyberbully and improving the safety of internet users, including children [1,2]. In the literature, there are numerous studies to prevent cyberbully in what is called intervention and prevention approaches. Such methodologies originate from the research and education fields. In any case, these philosophies are generally uncommon, besides, cyber bully casualties regularly decline to talk with a parent [3], teacher [4], or other adults [5]. They spend much time online [6], tend to get anonymous help [7], and post on the Internet a need for information and assistance [8].However, the viable method of conveying cyber bullying arrangements is through the Internet. Web-based approaches can also be used whenever and wherever the patient prefers [9].For instance, the University of Turku, Finland, has established an anti-cyber bully program called Kiva [10], and Anti-Harassment campaign in France [11], and an anti-cyber bully initiative by the Belgian government [12].

C. Feature Extraction

Here we consider each comment and initially pre-processed the data for the removal of stopping words, special characters, etc. At that point, the component remarks were vectorized or tokenized into different n-gram forms using the bag of words algorithms. Here first we tried unigram, bigram, and trigram, then followed by the combination of these 3 in terms of the n-gram.

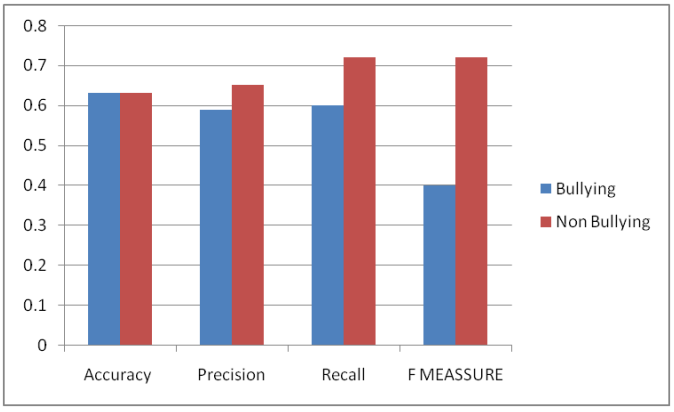
D. Algorithms Used and Results

Here we consider three machine learning algorithms for the comparative study a Decision Tree, Logistic Regression, and finally SVM. We use NLTK libraries to train the models and to compare their performance.To measure the effectiveness of the classification model four performance metrics used are. Accuracy: Test's ability to correctly predict both classes. Precision: Test's ability to correctly detect positive classes from all predicted positive classes. Recall (Sensitivity): test's ability to correctly detect positive classes from all actual positive classes.F1 Score: harmonic mean of precision and recall.

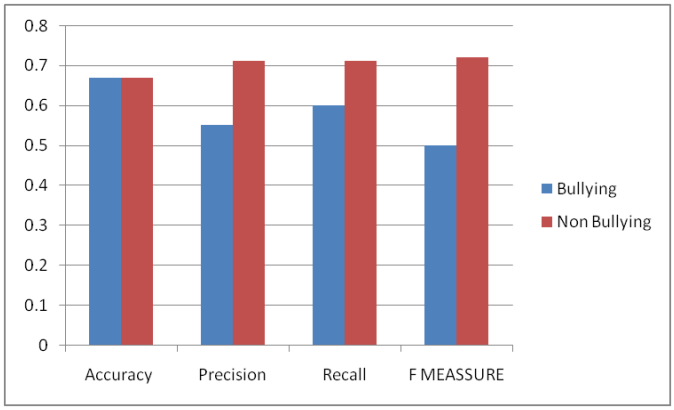
III. RESULTS AND DISCUSSION

A. Decision Tree Algorithm

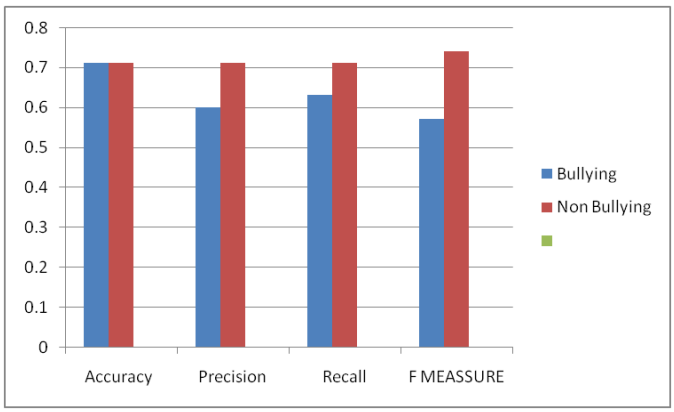
It goes under the class of supervised learning. They can be take care of both relapse and grouping issues. Choice tree utilizes the tree portrayal to take care of the issue in which each leaf node relates to a class label and traits are addressed on the internal node of the tree. Any Boolean function on discrete attributes can represent using the decision tree. The parameters use in our system includes binary=True, entropy_cutoff=0.7,depth_cutoff=6,and support_cutoff=20.



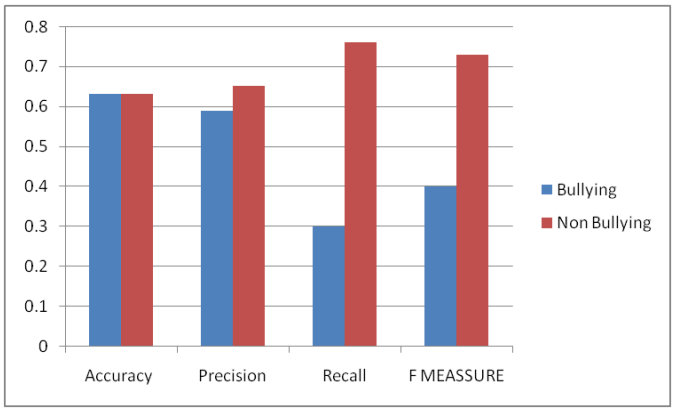
Results of Decision Tree using unigram



Results of Decision Tree using bigram



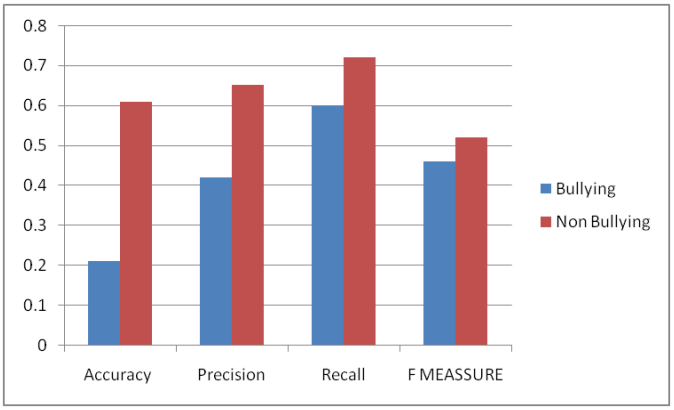
Results of Decision Tree using trigram



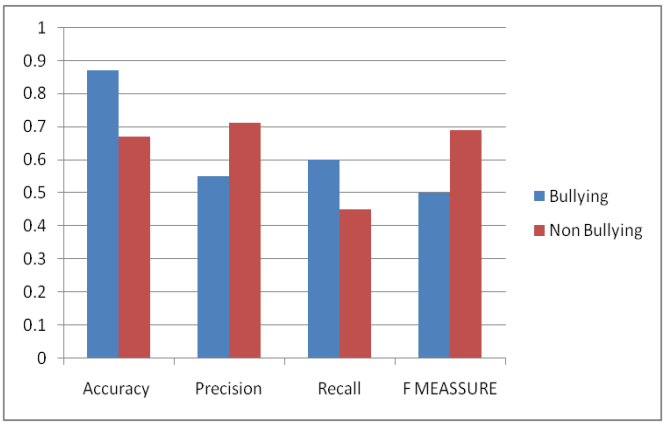
Results of Decision Tree using ngram

B. Logistic Regression

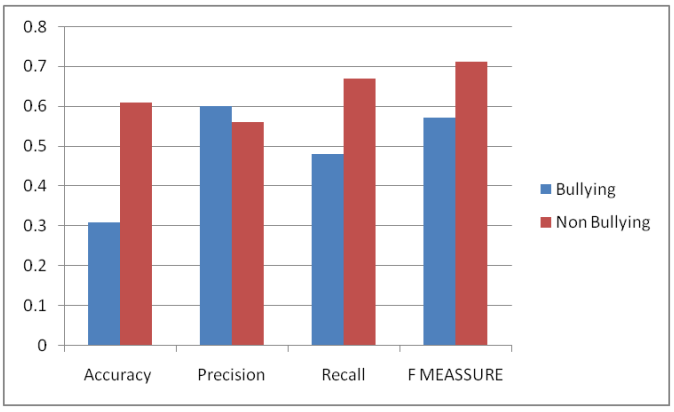
Strategic relapse is a factual model that in its essential structure utilizes a calculated capacity to demonstrate a double reliant variable, albeit a lot more unpredictable expansions exist. In regression analysis, logistic regression (or logistic regression) is estimating the parameters of a logistic model (a form of binary regression) Parameters which we use includes algorithm='gis', trace=0, max_iter=09, and min_lldelta=0.6



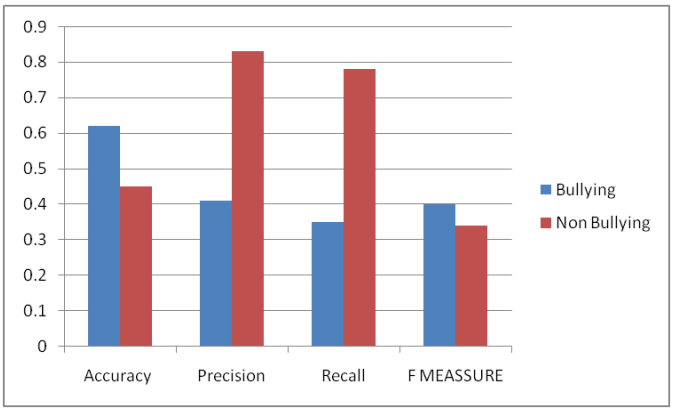
Results of Logistic Regression using Unigram



Results of Logistic Regression using bigram



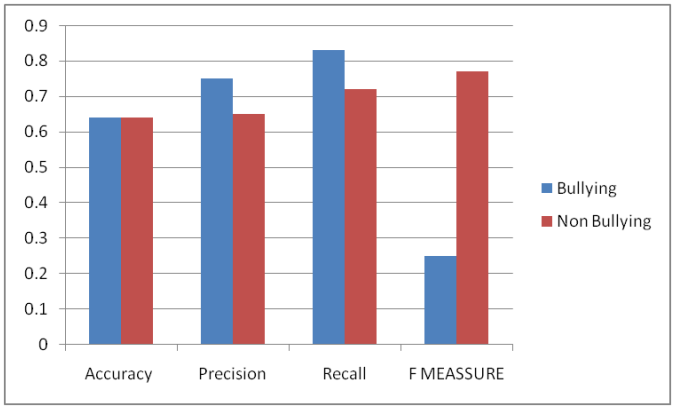
Results of Logistic Regression using trigram



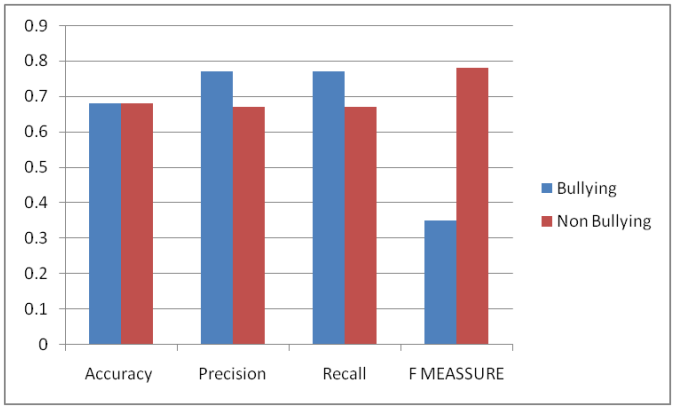
Results of Logistic Regression using ngram

C. Support Vector Machine

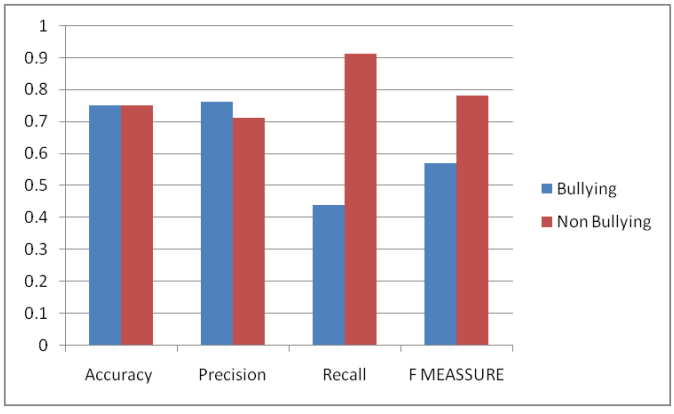
Support Vector Machine is a discriminative classifier for both linear and nonlinear data. Data from two classes can be separated by a hyperplane. It uses a nonlinear mapping to transform training data into a higher dimension. Here the given labelled training data uses the algorithm to give the optimal hyperplane which can classify new data[].A SVM model is the portrayal of information as focuses in space planned so the instances of the different classifications are isolated by a reasonable hole that is wide as could really be expected



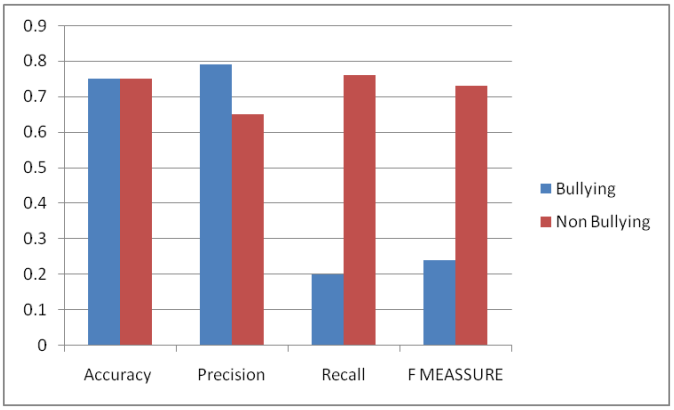
Results of SVM using unigram



Results of SVM using bigram



Results of SVM using trigram



Results of SVM using ngram

IV. CONCLUSION

In this paper, we proposed a way to deal with distinguish cyberbullying utilizing machine learning procedures using youtube data set. With help of three different machine learning classification model and natural language processing algorithms like bag of words. And we found that comparatively SVM with trigram have the highest performance of 75% accuracy and other performance measures..

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Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

A Comparative Study of Deep Learning Techniques for the Prediction of Blood Glucose Level In Type-1 Diabetic Patients

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ABSTRACT

Diabetes Mellitus is a physical condition where one's pancreas becomes disable to produce enough insulin, resulting in poor metabolism of carbohydrates and elevated levels of glucose in the blood. The primary aim of this study is to compare two deep learning models for predicting blood glucose (BG) level so as to prevent hypo or hyper-glycaemic condition in Type-1 diabetic patients. Deep Learning Techniques can be used to predict the upcoming hypo or hyper glycaemic condition by learning glucose evolution patterns. This study compares the difference between the prediction using Convolutional Neural Networks (CNN) and Feed-Forward Neural Networks (FNNs), The FNN is an artificial neural network where connection between the nodes do not form a cycle. Working of CNN is same as FNN with a difference that CNN is trained through back propagation.

Keywords: Diabetes Mellitus, Deep Learning, Convolutional Neural Networks, Feed-Forward Neural Networks (FNNs)

I. INTRODUCTION

When we intake carbohydrates, our body turns it into glucose which freely flows in our bloodstream. In normal case our pancreas releases insulin, which will convert the excess glucose into a different form called glycogen and store it in body cells and reuse it when needed.

In patients with diabetes, due to deficiency or lack of insulin, this excess glucose cannot be digested. The total glucose level in the blood goes beyond the limit. This state of human body is called Diabetes Mellitus. DM mostly of three types namely Type-1, Type-2 or gestational diabetes. Type-2 diabetes occurs when the amount of insulin produced in one's body is not enough to satisfy their daily needs. Gestational diabetes happens during the time of pregnancy due to variations in the production of different hormones in our body. Type-1 diabetes is mostly an autoimmunity disorder. It happens when your body misunderstand the beta cells of your pancreas as a foreign body and with antibodies. Hence the organ fails to produce insulin. People with type- 1 diabetes should maintain

healthy lifestyles through proper medication, controlled diet and physical workouts.

Traditionally, diabetic patients are monitored by measuring their blood glucose level using finger stick blood glucose meter (glucometer) three or four times daily. But the disadvantage of this method was it could not detect fluctuations in blood glucose level due to physical activities, sudden emotional stress or, improper food intake. As a result, insulin injections are often over- or under-dosage with respect to the actual need which may lead to periods of hyperglycaemia (persistent blood glucose (BG) concentration > 180mg/dL) and hypoglycaemia (BG concentration < 70mg/dL)

The new generation smart-health-care system introduced many advanced technologies which helped patients to gain better control over their blood sugar level. In order to provide proper insulin-based treatments to diabetic patients, continuous glucose monitoring has been devised using Continuous Glucose Monitoring Systems (CGMS). A CGM normally contains two parts, a sensor and a reader/scanner. A tiny sensor will be inserted under the patient's skin. The sensor measures your glucose level, once in every 10- or 15-minutes minutes. We can see the measured BG value through a monitor. The monitor could be an insulin pump or a separate device.

A CGM may collect a considerable amount of data, which may be stored and used in future to learn the glucose level patterns of that particular patient and there by predicting the occurrence of life-threatening hypo or hyper glycaemic condition.

A literature study on the deep learning techniques used for predicting the blood glucose level in a Type-1 diabetic patient, suggests various neural network strategies for learning the blood glucose level patterns and predicting upcoming events of hypo or hyper glycemia. In this paper, we have covered a comparative study on two of such techniques, namely Convolutional Neural Network (CNN) and Feedforward Neural Network (FNN).

The FNNs is organized in layers with each layer contains a number of neuron-like units. The concept is a biologically inspired classification of algorithms. The CNN is similar to feed-forward artificial neural network. In the learning phase the errors in one stage are propagated back to the previous stage. IN FNNs, the information moves from input to output only, through some hidden nodes.

The paper is organized as follows. Section II briefly introduces the features of CNN and FNN and their working model towards the prediction of BG level. Section III describes the result of the comparative study of the two deep learning techniques CNN and FNN. Finally, Section IV summarises the paper.

II. METHODS AND MATERIAL

The Convolutional Neural Networks are most commonly used for image classification. But they can be used for any application where we have structured inputs which can be filtered using convolutions. The convolutional neural network has three parts: the input section, hidden section and output section. The hidden section consists of three layers. They are convolution layer, pooling layer and fully connected layer. The hidden layer is responsible for extracting the features of what is given as input. In this part, the network will perform a series of convolution and pooling operation. The next phase is the classification part, in which the fully connected layers will serve as the classifier.

Feed-forward neural networks or Multi-Layer Perceptrons (MLP) are used to learn the relationship between independent variables, provided as inputs to the network, and dependent variables that are outputs of the network. They are called 'feed forward' because, information flows in only one direction, ie: from the input to the output, through some hidden layers. A network may contain any number of hidden layers with any number of hidden neuron-like units.

The convolutional neural network itself is a feedforward neural network, trained using backward

propagation. The difference is only in the stage of learning phase only. After learning process, the CNN works the same as a feedforward network.

In our study, we compared the efficiency of CNN and FNN, for the DM subjects by optimizing the input and hidden layer neurons. By learning the previous data patterns, we have tried to predict the future data using the methods in consideration.

A. Data Set

The dataset used in this paper was taken from a free online mathematical diabetic simulator called AIDA. It has 40 case studies with different age group, diseases, and meal intake. Each data set consists of 24 hours of data for a particular subject. The sample size is 15 minutes. In this paper, we only used data of 10 subjects from case 001 to case 010. The data can be accessed from AIDA website [5] [6].

B. Performance Analysis

The performance is evaluated using the Root Mean Square Error. It is the most commonly used methods for evaluating the quality of prediction techniques. Root mean square error can be expressed as

$$RMSE = \sqrt{\frac{\sum_{i=1}^{N} \|y(i) - \hat{y}(i)\|^2}{N}}, \quad [4]$$

where N is the number of data points, y(i) is the i-th measurement, and y^(i) is its corresponding prediction.

III. RESULTS AND DISCUSSION

To perform our analysis, ten subjects are used from AIDA diabetic simulator with a wide range of features such as the meal schedule, insulin, nocturnal hyper, and weights. The natural glycaemic control is considered as the BG between 70-140mg/dl after 1-2 hours of meal Ingestion which can be deemed consistent with the standards of the American Diabetic Association.

Table 1 shows the RMSE of 10 subjects in the prediction horizon of 15 minutes, simulated using the feedforward neural network. The data is simulated using the feedforward neural network. The lower RMSE is 0.547 mg/dl and the highest is 2.03 mg/dl.

Table 1: RMSE evaluated in case of FNNs

Case	Input Neurons	Hidden Neurons	PH (minutes)	RMSE (mg/dl)
01	6	7	15	0.9848
02	2	1	15	1.504
03	5	7	15	0.90
04	6	3	15	1.996
05	7	1	15	0.732
06	6	2	15	0.547
07	5	3	15	2.03
08	3	3	15	1.648
09	6	1	15	0.201
10	8	7	15	0.929

The variation in RMSE values is due to the difference in the features such as time difference in food intake, physical exercises and other health conditions. The average value of RMSE when evaluated with FNN is 1.147mg/dl.

Table 2 shows the RMSE simulated for the data of the same subjects in the prediction horizon of 20 minutes, evaluated using Convolutional Neural Networks. The resulted RMSE shows highest value as 21.03 mg/dl and lowest value 18.4 mg/dl. The mean of the results comes up to 19.84 mg/dl.

Table 2: RMSE evaluated in case of CNNs

Case	Input Neurons	Hidden Neurons	PH (minutes)	RMSE (mg/ld)
01	6	7	20	20.13
02	2	1	20	18.4
03	5	7	20	21.02
04	6	3	20	19.01
05	7	1	20	19.908

06	6	2	20	20.554
07	5	3	20	18.92
08	3	3	20	19.464
09	6	1	20	21.03
10	8	7	20	20.009

Figure1 is a bubble chart demonstrating the assessment between the RMSE values evaluated with the two methods CNN and FNN. The DM subjects are plotted along the x axis against the RMSE calculated for each subject along Y axis.

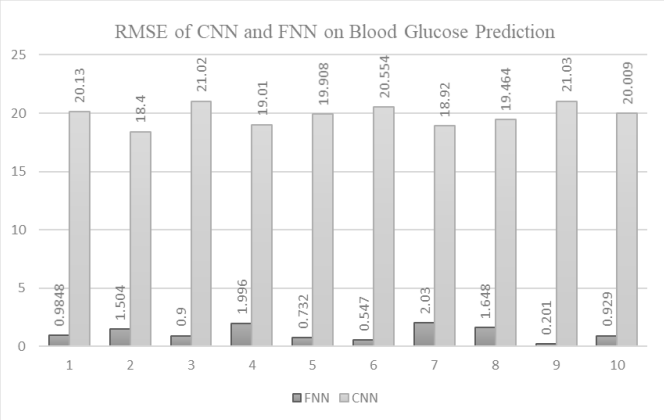

Figure1: Column chart showing the RMSE calculated for DM subjects based on CNN and FNN

It is clearly evident from the study that the Feedforward neural network shows the best result in terms of RMSE when compared to Convolutional Neural Network in the case of predicting blood glucose level.

IV. CONCLUSION

Diabetes Mellitus is a disease condition, which is very common now a days. It requires continuous follow-up and care. Prediction of blood glucose level for the near future is very helpful, especially in case of Type-1 diabetic patients. This will help them to prevent the occurrences of hypo or hyper glycemia. There are a number of deep learning techniques used to predict the blood glucose level in Type-1 diabetic patients. In this paper, we have studied two of such methods, CNN and FNN. According to our analysis, with respect to RMSE, the error rate is approximately lesser in the case of feed forward network. So, for the prediction of blood glucose level, Feedforward Network is a better option than Convolutional Neural Network

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Deep Learning for Saliency : A Review

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ABSTRACT

Attention is the process of selectively concentrating on a specific aspect of information by neglecting the other perceivable information. Same concept is deployed in Visual attention through certain set of visual scenes to find some characteristics of the image. It needs the ability to orient to and sustain focus on a stimulus such as a person or inanimate object or task. Our eye movements depict the focus of the visual attention. Visual saliency measures how likely human eyes will fixate in certain part of the image. The process of applying certain image processing and computer vision algorithms to automatically locate the most salient regions of an image. This works uses a deep model for finding the saliency maps.

Keywords : Visual Saliency, Saliency Detection Model, Saliency Map

I. INTRODUCTION

Visual attention is the process that helps the human visual system to select the most relevant information from a visual scene. Visual saliency measures how likely human eyes will fixate in certain part of the image. Deep neural networks have provided a great success in image saliency prediction. The main advantage of using deep learning is performance of deep learning algorithms increases when amount of data increases whereas, performance of other learning algorithms decreases when increases amount of data. Elements like convolutional neural networks (CNN) in the deep learning are used to carry out the feature extraction and the classifications of an image. The use of CNN for feature extraction yields nearly state of the art results in image classification and good generalization properties. They are very strong visual models and are able to learn features from a raw image dataset (low-level feature) and generate a feature map (high-level feature). The Fig 1 shows the structure of a saliency detection process, architectures like RESNET, VGG-16, ALEXNET are used in the encoding and decoding networks of saliency model.

In computer vision, visual attention is the process that enables the human visual system to choose the most relevant information from a visual scene. Saliency is used to measure how likely the human eye fixate in the certain part of the visual scene. The figure 1.1 shows an image, normally the attention is not spreading to the entire scene rather the focus is pointing only some part of the image and are known to be salient region which is depicts in the figure1.1(b).

(a)

(b)

Figure 1.1(a) Original image (b) Salient region, visually more conspicuous area with respect to the surrounding regions.

The organization of this document is as follows. In Section 2 (**Methods and Material**), in section 2 explain overview of the various approach in the saliency detection to equipment or equipment constructed specifically for the study and, if pertinent, provide illustrations of the modifications. In Section 3 (**Result and Discussion**), is the analysis of 10 different model present your research findings and your analysis of those findings.

II. METHODS AND MATERIAL

The aim of these models is to improve artificial vision systems by computing a numerical value of the attending to, or the saliency of, every location in an image. Several datasets are used within the models, each contain eye tracking data from different observers, commonly used are MIT300, MIT1003, iSUN, SALICON, CAT2000. An image is drawn from the dataset and passes through the model and a map is created by taking the mean of all the feature maps generated from the CNN models. The map helps to highlight the important regions of the image and processed only the highlighted parts. Finally calculate the loss function from the ground truth map and use it in specific applications.

A. Classic models

SUN saliency model : The [3] Saliency Using Natural statistics (SUN) model combines top-down and bottom-up information to predict eye movements during re-a world image search tasks. SUN implements target features as the top-down component. SUN outperformed salience driven model in predicting human fixation positions during real-world image search. it uses natural statistics based on a Bayesian framework to estimate the probability of a target at every location.

Graph-Based Visual Saliency: A [4] bottom-up visual saliency model, Graph-Based Visual Saliency (GBVS),is proposed. It consists of two steps firstly forming activation maps on certain feature channels, and then normalizing them in a way which highlights complicit and admits combination with other map.

Spectral Residual Approach :This [5] is intent to provide features, categories, or other forms of prior knowledge of the objects. By analysing the log-spectrum of an input image extract the spectral residual of an image in spectral domain, and propose a fast method to construct the corresponding saliency map in spatial domain.

Other models Some other models are Attention for Information Maximization (AIM) [6],Adaptive Whitening Saliency (AWS) [7],Boolean Map based Saliency(BMS)[8] , [9] and the Judd model Some classic video saliency models include: AWS-D OBDL [57], Xu ,PQFT and Rudoy et al.

B. Deep models

The evolution of convolutional neural networks (CNN) on large scale object recognition, has brought along a new types of saliency models that perform markedly better than traditional saliency models. These models to re-use the semantic visual knowledge already learned in CNNs and successfully transfer it to the task of saliency.

SalNet [10]approach uses a completely data-driven approach, with a large amount of annotated data for saliency prediction. The model uses a CNN that consists of five layers with learned weights: three convolutional layers and two fully connected layers. Each of these three convolutional layers is followed by a rectified lin-ear unit non-linearity (ReLU) and a max pooling layers. The deconvolution layer follows the final convolution coproduce a saliency map that reflects the input width and height.

SalGan:[11] consists of two networks, one predicts saliency maps from a raw pixels of an input image

whereas the other one takes the output of the first onto discriminate whether a saliency map is a predicted one or ground truth. It contains a generator and discriminator networks. The filter weights in SalGan have been trained over a some loss resulting from combination of a content and adversarial loss. The content loss is calculated in a per-pixel basis, where each value of the predicted saliency map is compared with its corresponding peer from the ground truth map.

DeepFix : fully convolutional neural network for accurate saliency prediction. The input image is followed by 5 convolutional blocks. It is similar to the VGG-16net .These are the followed by a an inception block and consists of a set of convolution layers with different kernel sizes operating in parallel. The weights of VGG-16 network have been learnt by training on 1.3 million images of the ImageNet database. These are followed by a Location Biased Convolutional (LBC) layers. At last the output from the second LBC layer (in (7) is fed to a 1×1 convolutional layer whose output is taken to be the predicted saliency map

EML-NET: Expandable multi-layer network Multiple powerful deep CNN models to better extract visual features for saliency prediction. The DenseNet-161 model is pre-trained on the PLACE365 dataset and the

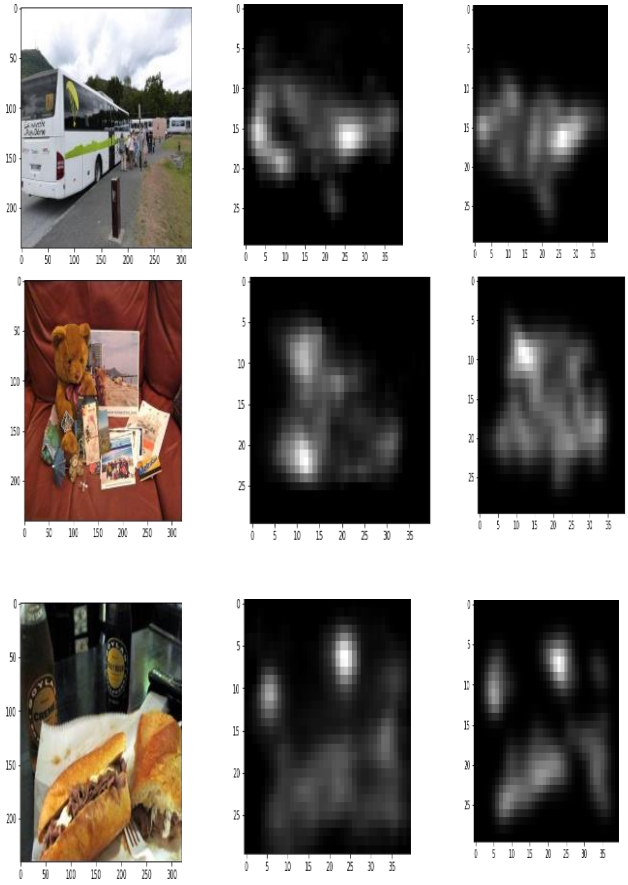

Figure 1.2 original image, salient regions of predicted and original

NasNet-Large model is pertained on Image Net. The input image applied to the CNN model to extract the feature map. The encoder and decoder are separately trained

•Saliency Attentive Mode: [10] architecture that in corporates an Attentive Convolutional based on Long Short-Term Memory network(LSTM) [3] .That

focuses on relevant spatial locations to refine saliency features. The model architecture is original since the LSTM model issued to achieve a refinement over an image, instead of handling a temporal sequence. The model uses a dilated CNN network to extract the feature maps of the input image. The Attentive Convolutional LSTM sequentially enhances saliency features thanks to an attentive recurrent mechanism. Multiple learned priors are used to combine all the predictions to model the tendency of humans to fix the centre region of the image.

Deep Visual Attention Prediction: In order obtain saliency features; supervision is directly fed into corresponding layers. The CNN defined on a translation invariance basis and shared weights across different spatial locations and each layer input and output in a network are three-dimensional tensors, called feature maps. The up sampling the coarse feature map, deconvolution layer could be used. For all the saliency feature map, a decoder with a multiple deconvolution layers is added to enlarge the spatial dimension until getting saliency prediction with original input size.

III. RESULTS AND DISCUSSION

Let us consider a CNN with a one convolutional layer which is followed by a fully connected layer trained to predict fixations. This model generalizes the classic model and that in turn learn to combine feature maps. The learned features in the CNN can be combined linearly by the fully connected layer. In order to handle the scale dependency of saliency computation, the classic models often recruit multiple image resolutions. But the deep saliency models concatenate maps from several convolutional layers, or feed input from different encoder layers to the decoder to get the det preserve fine details. The Figure 1.2 shows the original salient part and the predicted part by the model. Evaluates the classic models and deep model using the evaluation metrices like Earth Movers Distance (EMD), Normalized Scanpath Saliency (NSS), Similarity Metric (SIM), Linear Correlation Coefficient (CC), AUC-Judd, AUC-Borji, and shuffled AUC.

Normalized Scanpath Saliency (NSS)

This metric is calculated by taking the mean of scores assigned by the unit normalized saliency map S_n

$$NSS = \frac{1}{N}\sum_{i=1}^{n} S_n(\mathrm{i})$$

where N is the total number of human eye positions. when NSS value is 1 the saliency map shows significantly higher saliency values at human fixated locations compared to other locations.When NSS 0 indicates that the model performs no better than picking a random position, and hence is at chance in predicting human gaze.

Area Under Curve (AUC)

In AUC, there are two image locations that are used actual human fixations as the positive set (fixation distribution) and some points randomly sampled from the image as the negative set. Depending on the choice of the non-fixation distribution the AUC are classified into 2 types. AUC with uniform distribution of non-fixation points (AUC-Judd and AUC-Borji) and the shuffled-AUC. The saliency map S is then treated as a binary classifier to separate the positive samples upon the negatives. Thresholding over the saliency map and plotting true positive rate on the false positive rate an ROC curve is achieved and its underneath area is calculated.

Linear Correlation Coefficient (CC)

It measures how correlated or dependent two variables are and CC can be used to interpret saliency and fixation maps, G and S as random variables to measure the linear relationship between them

$$CC = \frac{cov(S,G)}{\alpha(S) * \alpha(G)}$$

cov(S, G) finds the covariance of S and G and ranges between -1 and +1, and a score close to -1 or +1 indicates a perfect alignment between the two maps.

TABLE I

PERFORMANCE OF SALIENCY MODELS OVER THE MIT300 DATASET

Saliency models	AUC	CC	NSS	SIM
EML-NET	0.88	0.79	2.47	0.68
Deep Gaze 2	0.88	0.52	1.29	0.46
DeepFix	0.87	0.78	2.29	0.67
SAM-Res	0.87	0.78	2.34	0.68
SAM-VGG	0.87	0.77	2.3	0.67
SalGAN	0.86	0.73	2.04	0.52
DeepGaze1	0.84	0.48	1.22	0.39
GBVS	0.81	0.63	1.24	0.48
SUN saliency	0.67	0.68	1.27	0.38

The most evident difference of classic models compares to deep architectures is the lack of ability to extract higher level features, objects, or parts of objects. The deep structure of CNNs allows capturing complex features that attract gaze automatically. This is the main reason behind the big performance gap between the two types of models. The Table 1 shows the Performance of saliency models over the MIT300 dataset.

IV. CONCLUSION

Vision in general and images in particular have played an important role in human life. Visual saliency has been an increasingly active research area over the last few years. Several models are developed to find the visual gaze in an image. These are commonly represented by saliency map. This synopsis contains the review of 3 classic models and 7 deep models and the evaluation matrix that predicts the saliency map. And from the Table 1 it is clear that deep models achieved impressive performances compared to classic methods.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Design and Analysis of Bamboo Substrate Aramid Layered Composite Helmet Shell

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ABSTRACT

This work presents results from both experimental and numerical simulations of static deflection analysis of a Bamboo Substrate Aramid Layered Composite Helmet Shell and Impact absorption simulation test of the helmet shell to meet the world standards of a Helmet. The experiments involve applying design load at different points of the helmet while clamping at different positions. The material properties of Aramid layer and Bamboo substrate aramid layer is found out by performing three point bending tests on specimens cut from the helmet realized. The validation of material properties is done by comparing the experimental data with finite element model constructed from CT images and studied. A comparison of helmet deflection between the test and analysis using both tetrahedral and layered shell elements are made. Drop test simulation performed on the helmet shell with varying thickness of aramid layers to optimize thickness to satisfy the helmet standards .Using layered shell element explicit dynamic analysis is carried out for a touchdown velocity of 30km/hr. at a height of 2.2m from the ground as per the standard. A parametric study with progressively increasing aramid thickness (for a constant 2mm bamboo shell thickness) for the helmet under impact is studied.

Keywords: Composites, Bamboo Helmet, Aramid Fibers, Engineering and Technology

I. INTRODUCTION

Helmets are the primary safety measure for a vehicle rider from severe injuries during traffic accidents. In developing countries traffic injuries been recognized as a major health problem. In order to overcome this helmet act for motorcyclist was enacted in many countries. Some countries often enforced the helmet use nationwide. During accidents the two wheeler motor cycle rider is most likely to sustain serious injuries. The most affected part to injury is human head. It undergoes acceleration, deceleration and rotation forces because it is freely mobile in three dimensions and occupies a relatively unstable position, being secured only by the neck .One of the effective countermeasures to prevent head injuries in motorcycle crashes is the use of a protective helmet. This study focuses on the design and analysis of bamboo substrate aramid layered composite helmet for better impact resistance.

In this particular study bamboo substrate helmet is fabricated considering the existing dimensions of the helmet by hand layup process. Then the fabricated model is scanned using CT scanner and with the help

of Software's 3d slicer, Geo-magic mesh, Pro-E and Abaqus Finite model is created. To find out the material characterization of aramid layer and bamboo substrate aramid layer specimens are fabricated and conducted bending test. To validate the material property static deflection analysis is conducted in the selection portions of the helmet and compared with the numerical simulations and stiffness ratio is calculated. After the validation, using explicit dynamic analysis drop test is simulated and the deflection value is found out to compare with the helmet standards.

II. METHODS AND MATERIAL

A. Fabrication

Fabrication of helmet was carried out by following hand layup process. Initially bamboo strips were tightly wound around the conventional available standard helmet which acted as the mould for bamboo substrate helmet fabrication shown in Fig. 1. Under the Bamboo substrate a layer of aramid mat with epoxy and hardener which will act as an adhesive are applied and maintained a fiber direction of 0 degree of aramid mat as shown in Fig. 2.Over the aramid mat three more layers are arranged at -45degree, +45degree and 90degree in order to make the aramid bamboo structure quasi-isotropic.

Figure 1: Bamboo Substrate

Each layer are compressed by manual hand operation with the help of sand filled bags (Fig. 3) to ensure proper bonding between aramid layers and bamboo. Then the bamboo substrate composite helmet allowed for settling time of about 6-8 hours. After well cured and dried the extra projections were cut and smoothened with the help of sand papers to achieve the desire shape (Fig.4).

Figure 2: First Aramid Layer

Mass of bamboo substrate after the fabrication was 110gm. After the introduction of each aramid layer there was a considerable mass variation which is shown in Table 1.

TABLE 1
MASS VARIATION

Serial No.	Mass Variations	
1	Mass of Bamboo Substrate	110gm
2	Mass of Epoxy Used	100gm
3	Mass Of Aramid Cross Section	40gm
4	Mass Of Bamboo Composite After First Layer Introduction (0 degree)	170gm
5	Mass Of Bamboo Composite After Second Layer Introduction(-45 degree)	233gm
6	Mass Of Bamboo Composite After Third Layer Introduction(+45 degree)	297gm
7	Mass Of Bamboo Composite	358gm

	After Fourth Layer Introduction(90 degree)	

Figure 3: Manual Sandbag Pressure Application

Figure 4: Bamboo Substrate Composite Helmet

B. Experimental Set Up

Testing on BSCH simply refers to the static deflection analysis of the helmet at different points using Universal Testing Machine. Points are chosen on BSCH in such a way that it can be replicated on analysis software.

The bottom corner of the helmet is clamped (Figure 5) and with respect to that point load is applied and deflection is noted. The procedure is repeated at different points which are 5cm away from each other and the same procedure is repeated for all other sections.

Figure 5 : Bottom Corner is Clamped

Load applied at bottom corner section, front section and back section by fixing respective positions. A linear load is applied. To find the exact variation of stiffness properties across the cross section many points are chosen at different section shown in Figure 6, 7.

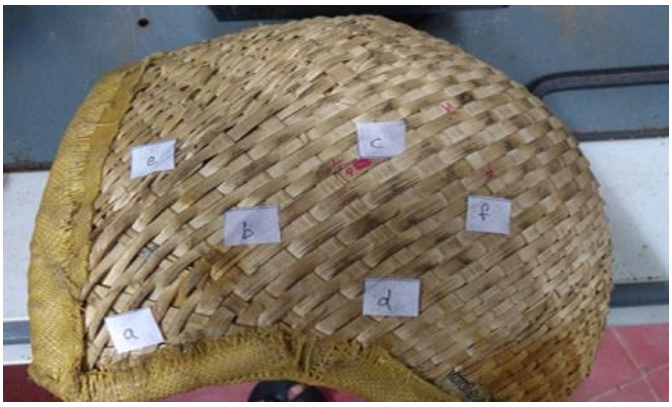

Figure 6 : Side Load Applying Points

The design loads of experimental static deflection analysis are found from the following methods.

A. Impact Energy Approach:

Impact velocity was reported ranging from to 30m/s for an Impact distance of 0.9m, to impact energy of 150J.

So 150J=150Nm, 150/.9=167N

B. Impulse Approach:

The load can also be calculated by another approach by considering the mass. Here the mass of the helmet is 300gm and impact duration is 5milliseconds (.05) S and by using impulse equation we can calculate the load.

Equating mass x velocity with impulse formula,

Mass x velocity= 0.3kg x 30m/s = P x 0.05

P=180N

Figure 7 : Front Section Load Points

C. Aramid Layer Properties

Since the Bamboo substrate Composite Helmet Shell made of KEVLAR (Table 2) which is an aramid composite, its material properties depend on its fiber direction. It is very difficult to find the material properties on the unique shape of the helmet, ensuring that X, Y and Z material direction axes corresponds to the input material value. We have adopted the technique that by considering the complete shell as quasi-isotropic, (the fibers are arranged in 0 degree,-45 degree, +45 degree and 90 degree) and since the E value of bamboo is equivalent to that of KEVLAR, a net effective E value in isotropic material is provided for the bamboo substrate composite helmet.

TABLE 2

ARAMID FIBER PROPERTIES

Properties	Values
Fiber Density	1.45gm/cm^3
Weight	170gm/m^2
Dry Weight	127gm/m^2
Moisture Content	5%

Initially a specimen of aramid orientation 0 degree,-45 degree, +45 degree, 90 degree is fabricated .A specimen of 72mm X 34mm is made by arranging each layer of thickness 0.29 mm in 0 degree, -45 degree, +45 degree and 90 degree (Fig.4.6) and made it as a simply supported beam on UTM (Fig 7) and applied load and noted the deflection, and applying the beam deflection equation of a simply supported beam the E value being found out.

Figure 7 : Aramid Section

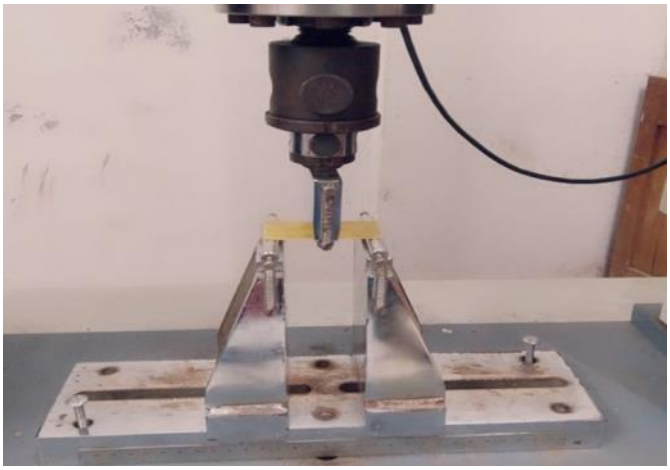

Figure 8: Bending Test on Aramid Section

Bending test are carried out in the four layer Aramid Quasi- I isotropic Specimen and found out the E value of the specimen as 6GPa. Load Deflection variation obtained is shown in the figure 8.

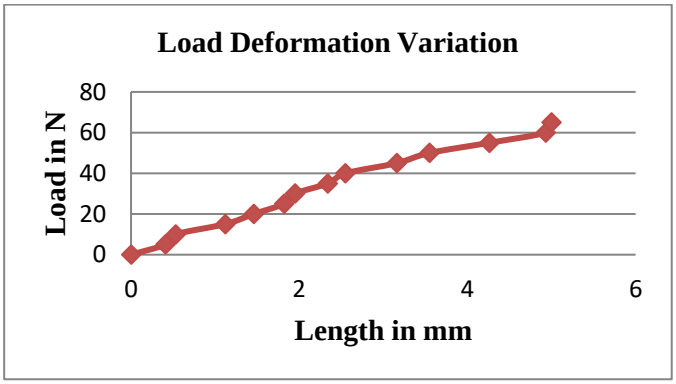

Figure 8: Load deflection curve of Aramid Section

A. Calculation of Stiffness Value of Aramid Layer

Deflection produced (dx) = 5mm

Load Applied (P) = 65N

Moment of Inertia (I) = (b×d3)/12 = (34×1.263)/12=5.67 mm4

Stiffness E value = (PL3)/ (48 dx I) = (65×503)/ (48×2×5.67) = 6.026GPa

Bending test are carried out in the four layer Aramid Quasi- I isotropic Specimen with bamboo layer and found out the E value of the specimen as 1306.84MPa.

B. Bamboo Composite shell Stiffness.

To find Bamboo substrate Composite Helmet Shell E value, a section of dimension 102mm × 32mm is cut down from the helmet shell (Fig.9) and aramid layers of 0 degree,-45 degree, +45 degree glued over it to make it as equivalent to the cross section of Bamboo Substrate Composite Shell (Fig. 10) and conducted bending test on UTM (Fig. 11) to find out the stiffness value.

Figure 9 : Bamboo Cut Section

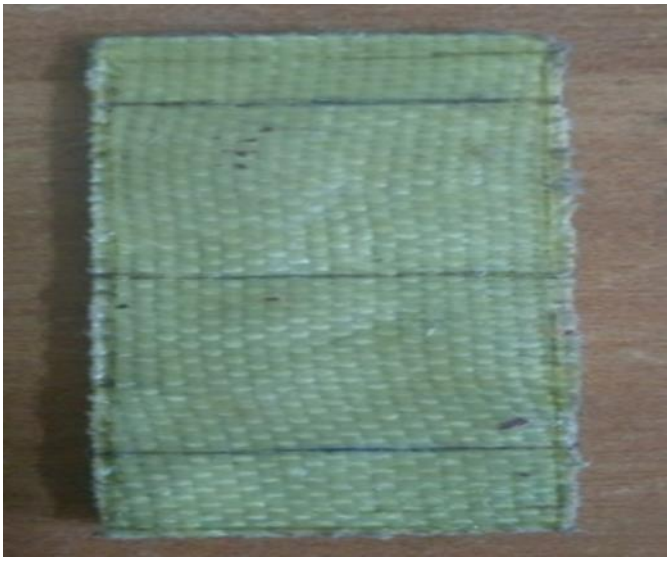

Figure 10: Cut Section front side and rear side

Figure 11: Bending Test on Helmet Specimen

C. Calculation of stiffness value of bamboo substrate composite shell cross section

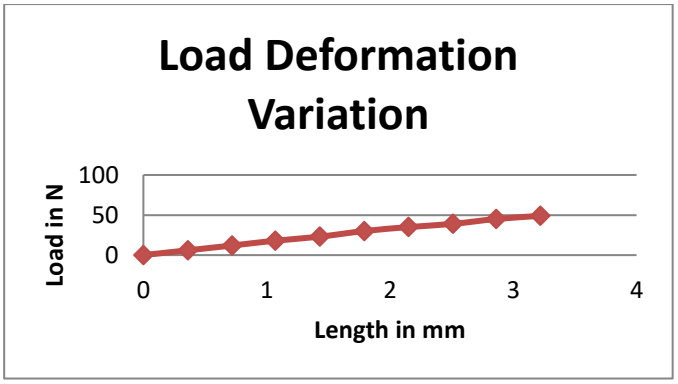

Figure 12: Load Deflection curve of BSCH section

Deflection produced (dx) = 2mm

Load Applied (P) = 37N

Moment of Inertia (I) = (b×d3)/12 = (32×3.63)/12=124.42mm4

Stiffness E value = (PL3)/ (48 dx I) = (37×753)/ (48×2×124.42) = 1306.84MPa

D. Numerical Simulation

The methodology used for model creation of helmet is given in the flowchart in Fig.13. Due to the complexity in geometry for various parts of the helmet the models are not drawn from scratch. Instead, the geometrical information of the helmet was scanned by a CT scanner and is extracted as axial images (in plane resolution of 512 x512 pixels with a pixel size of 0.68m and slice thickness of 0.6mm) (Fig 14). These CT images are then imported into 3D slicer- medical image processing software for reconstruction of models. In order to determine the extent of static deflection, a series of simulations are conducted using the finite element analysis (FEA) Software, Abaqus v6.10. The static deflection values can be correlated to test and the effective stiffness variation can be determined.

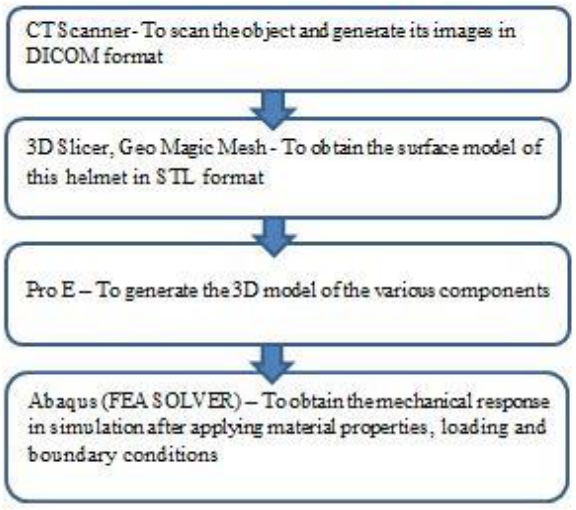

Figure 13: Methodology of Model Creation

To find the effective 'g' force produced during impact of the BSCH shell designed, an equivalent model is designed with the help of the software Catia shown in Fig 3.8. The mapping of the model designed with the existing model is shown in Table 3.2.There is a 12 % variation of dimension in height and lateral width. Overall diameter of the helmet is made same.

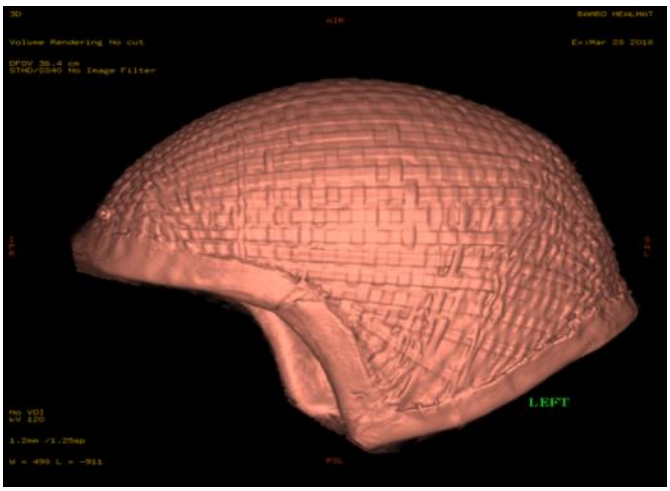

Figure14 : Scanned Helmet

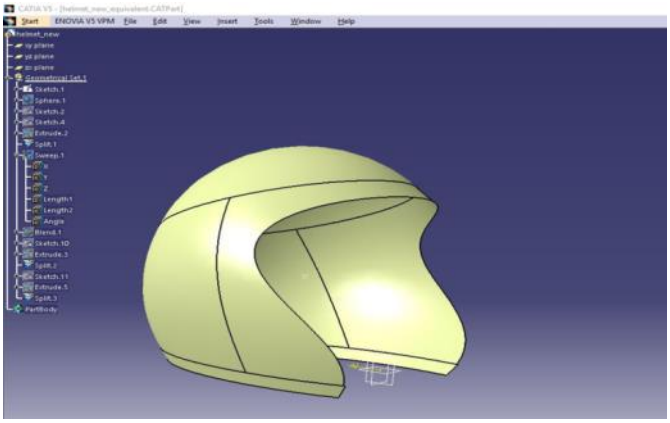

Figure15: Catia Model

TABLE 3

MAPPING OF BSCH AND DESIGNED MODEL

Parameters	Fabricated BSCH	Designed BSCH
Overall Diameter	190mm	190mm
Height from corner to top centre	240mm	200mm
Front Side width	180mm	180mm
Lateral width	180mm	200mm

E. Methodology of Drop Test Simulation & "G" Force

Drop test simulation of designed BSCH is done on Abaqus. Material properties are found out by

performing three point bending test on a fabricated aramid specimen. Then experimental static deflection value of the bamboo substrate aramid layered composite helmet on design load is compared with the numerical simulation applying same boundary conditions of the experiment. Then stiffness ratio is calculated.

After the validation, drop test is performed on the designed model and model with aramid layer of varying thickness and g force is calculated to optimize the net thickness for satisfying the standards.

The gravitational force or more commonly g force is a type of acceleration that causes a perception of weight. Since g force is a type of acceleration that can be measured with an accelerometer. g force for a falling body is given as,

'g' force = (Falling Height / stopping distance)

III. RESULTS AND DISCUSSION

Bamboo substrate aramid layered composite helmet shell hardware is realized shown in Fig.4. To evaluate the equivalent E value of the bamboo substrate aramid layered composite shell, a portion is cut down from the helmet (Fig. 9) and performed three point bending test. The equivalent E value obtained is 1.306GPa.

The 3D data of the model obtained from the CT scanner is imported into Abaqus software and assigned an isotropic material property of 1.306GPa and applied design load at front, crown, back and lateral side region and deflection is noted. The same boundary condition is provided on the experimental set up and load deflection variation at the front, crown back and lateral region is found out (Fig. 16 to Fig 18).

Drop test simulation is conducted or equivalent helmet shell model shown in Fig 3.8. The model dimension variation of the FE model and actual model is compared in Table3.2. There is an eighteen percent variation in height and ten percent variation in lateral width. To assign the material properties to the helmet a quasi-isotropic aramid layer specimen is fabricated and performed three point bending test to evaluate the equivalent E value. The effective E value obtained is 6.026GPa. Then composite lay-up material property is provided to the helmet shell and compared with the experimental value (Table 5.1) and found out the stiffness ratio. Then drop test simulation (Fig 5.12) is performed on the redesigned shell model and g force is calculated to evaluate whether it satisfy the required standards. Then aramid layers of varying thickness is provided to check the net variation in deflection corresponding to the mass variation and found that aramid layers having thickness.

A. Compression Results

The compression test was performed on different locations of bamboo substrate composite helmet to evaluate whether the material property stiffness of the helmet remains same everywhere on the cross section.

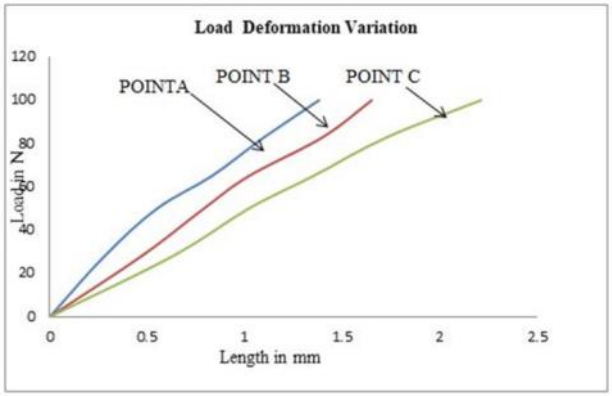

Figure 16: Load Deflection variation at the front region

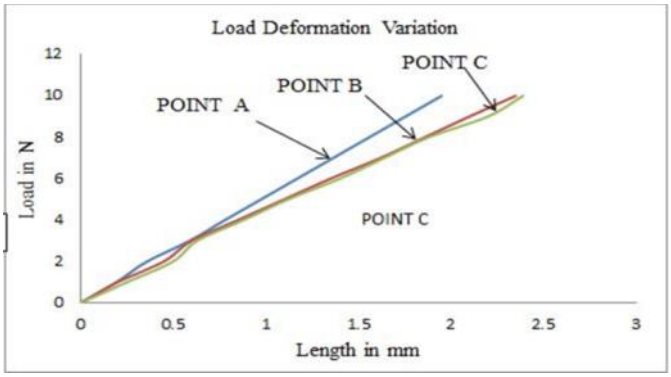

Figure 17: Load Deflection Variation at the side region

Nine points for selected for load applications, three points on the front region, one point on the crown region, two points on the back region and three points on the lateral side region and plotted load deformation variation shown in Fig 16, Fig. 17, Fig. 18 & Fig. 19.Points A, B & C shows the respective points of design load.

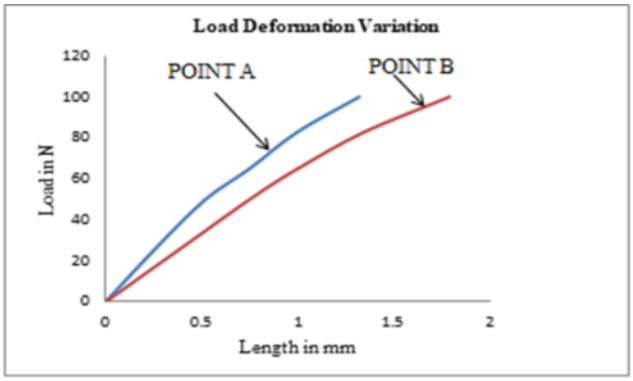

Figure 18 : Load Deformation variation at the back region

B. Numerical Results

Bamboo substrate helmet shell which is converted into IGS format with the help of Geo magic software is imported into Abaqus. The stiffness property of BSCH cross section from material characterization is found to be 1.306GPa and the whole model is considered as isotropic.

Element Type: 4 noded Tetrahedral shown in Fig 19

Degrees of Freedom: 6 degrees of freedom.

In order to validate the test results with numerical result the known design load is applied on the four selected top region, crown region, back region and lateral side region. The load and boundary conditions are shown in the Fig 20 and 21. The deflection obtained in the crown and side region are shown in the Fig 22 &23. Then the experimental value and numerical value are compared shown in Table 4.

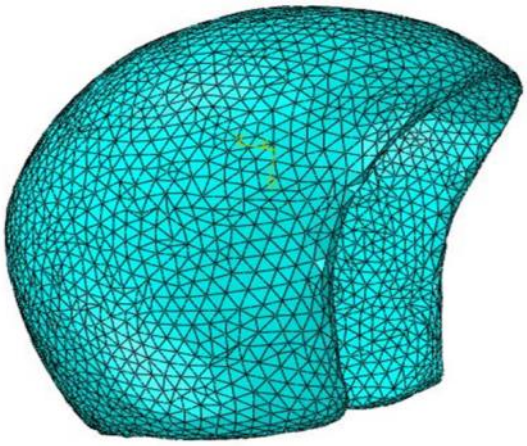

Figure 19 : Four Node Tetrahedral Node FE model

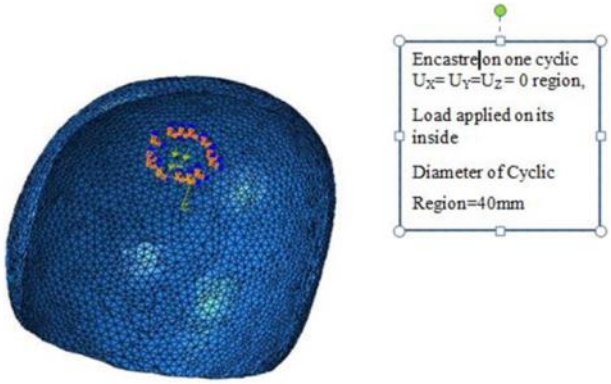

Figure 20: Load and Boundary Condition, Front Side Back Region

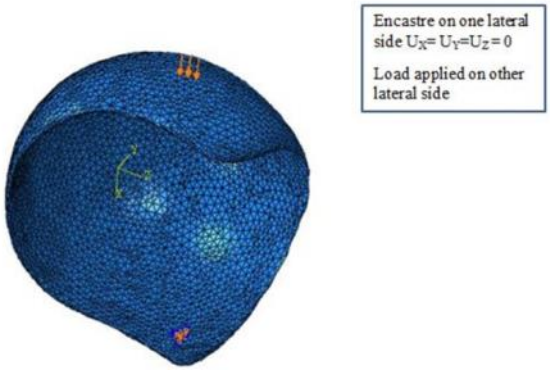

Figure 21: Load and Boundary Condition, side region

TABLE 4
DEFLECTION COMPARISON

Load (N)	Experiment Deflection	Simulation Deflection Tetrahedral	Simulation Deflection	Stiffness Ratio

	(Mm)	Node(Mm)	Quad Shell (Mm)	
Front Region				
100	2.32	0.50	1.83	1.26
Crown				
100	1.79	0.20	1.31	1.36
Back Region				
100	1.80	0.85	1.34	1.35
Lateral Side Region				
10	2.45	2.39	3.11	0.78

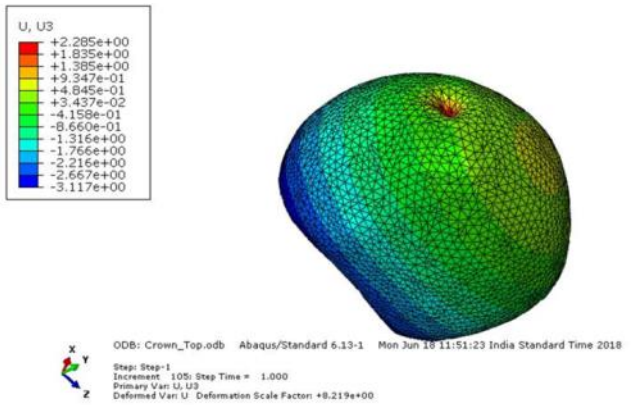

Figure 22: Deflection in the crown region

Deflection analysis is conducted on equivalent model BSCH shell designed on Catia. The variation of FE model with actual model is shown. Initially composite layup is provided on the BSCH. The values assigned to the Composite layup are E1= 6026Mpa,

E2= 6026MPa

Nu12=0.3

G12=500MPa

G13=500MPa

G23=500MPa

The value E12 is obtained from material characterization of aramid layer. Initially the load and boundary conditions are applied to equivalent BSCH model and compared with the experimental value shown in Table 5.1. Then stiffness ratio is calculated, it is found that it is 1.36. Element Type: 4 nodes Quad Shell Element

The deflection obtained in the Crown and side region are shown in the Fig 5.10 & 5.11. Then drop test is conducted on the equivalent BSCH and shown in Fig 5.12 and 'g' force produced in the model is calculated considering stiffness ratio

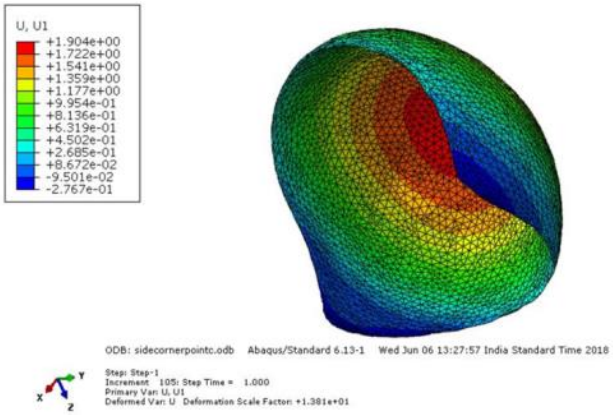

Figure 23: Deflection in the side region

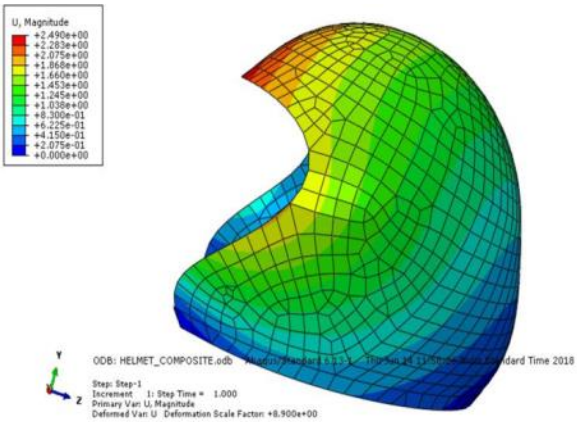

Figure 24: Deflection in the Crown Region

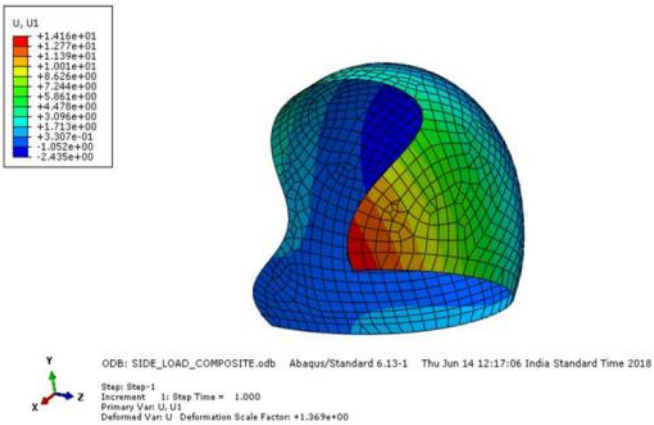

Figure 25: Deflection in Side Region

C. Drop Test Simulation

Drop test is conducted on equivalent model BSCH shell designed on Catia. The variation of FE model

with actual model is shown in Table 3.2. Initially composite layup is provided on the BSCH. The values assigned to the Composite layup in the engineering lamina property are E1= 6026Mpa, E2= 6026Mpa, Nu12=0.3, G12=500MPa, G13=500MPa, G23=500MPa. After finding the correlation drop test simulation on explicit dynamic analysis is performed on the designed equivalent model . The helmet is allowed to fall from a height of 2.2m.Quad shell nodes are considered, the overall thickness is assumed to be 4mm. The helmet is provided with composite lay-up with varying the thickness of aramid layers. Table 5.3 shows the deflection variations and g force produced.

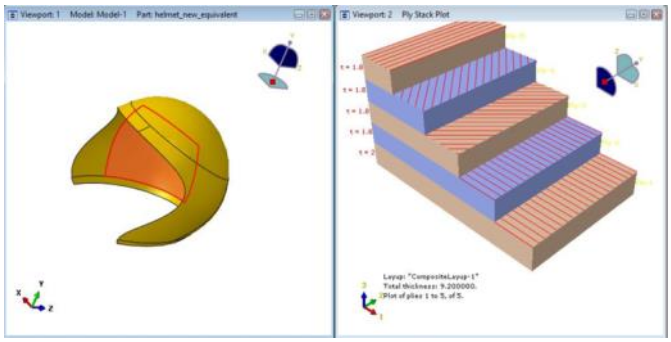

Figure 26: Bamboo Substrate Aramid Layer Composite Arrangement.

The deflection obtained from the impact analysis is used for the g force calculation. The net deflection obtained is 23.77mm. The stiffness ratio average obtained is 1.36.So the change in deflection corresponding to the variation in experiment and simulation are compared and found out to be 32.37mm. Stiffness Ratio experimental to designed model = 1.36

So net deflection change = Stiffness ratio x obtained deflection = 32.37 mm

The helmet is provided with composite lay-up with varying the thickness of aramid layers. Four layers of aramid with thickness of having 0 degree, -45 degree, +45 degree and 90 degree is provided and a 2mm bamboo substrate. Then again drop test is performed.

Then for different composite layups with varying thickness the net g force produced is calculated and compared for finding out ideal configuration when mass is considerable reduced shown in Table

TABLE 5

G-FORCE OF DIFFERENT MODELS

Thickness of Models	**Max. Deflection in mm (dx)**	**Net Deflection = (dx) x stiffness ratio**	**G force**
2mm Thick woven Bamboo +/0/+45/-45/90 of 1.26mm thick aramid layer (Realized)	23.77	32.37	67g
2mm Thick woven Bamboo +/0/+45/-45/90 of 1.8mm thick aramid layer	18.02	24.52	90g
2mm Thick woven Bamboo +/0/+45/-45/90 of 3.6mm thick aramid layer	**4.32mm**	**5.87**	**372g**
2mm Thick woven Bamboo +/0/+45/-45/90 of 7.2mm thick aramid layer	3	4.08	550g

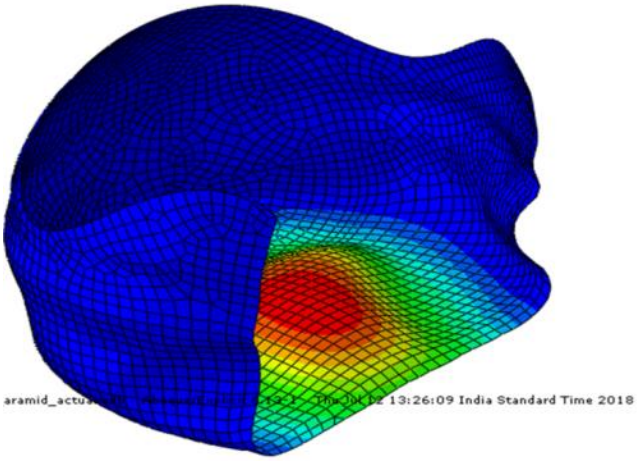

Figure 11: Drop Test Simulation

IV. CONCLUSION

Bamboo substrate aramid layered composite helmet shell is fabricated and properties of the aramid layered specimen and bamboo substrate aramid layered specimen is found out by three point bending test. Compression tests at different points of the helmet are carried out and validated using numerical simulations.

- Bamboo substrate composite layered helmet shell weighs 420gm corresponding to 375g, so there is 50% weight reduction in helmet shell. So there is a considerable load reduction on human head.
- Quasi- Isotropic aramid layered specimen 72 mm length x 34 mm breadth x 1.26 mm thick under bending test gives a stiffness value of 6.026GPa and bamboo substrate aramid layered specimen 102 mm lengths x 32mm width x 3.6mm thick specimen under bending test gives a stiffness value of 1.306GPa.
- Experimental and numerical static deflection analysis at front, crown, back and lateral side gives an average stiffness ratio of 1.36.
- Drop test simulation on the equivalent helmet shell model resulted in a deflection of 23.77mm.By considering the stiffness ratio the net deflection will be 32.37 mm. The g force produced in the realized hardware is 67g.
- When thickness of aramid layers increased, 2mm Thick woven Bamboo + /0/+45/-45/90 of 3.6mm thick aramid layer produced a net deflection of 5.87 mm, which produces a g force of 372 g. With the inclusion of cushioning the net g force produced in the head will be less than 300g specified by the world standards and it will satisfy the required standards.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Integration of Digital Technologies in the Indian Microfinance Sector

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ABSTRACT

The micro finance industry has a long and eventful history. It is evolved out of efforts to overcome poverty through capacity-building and women empowerment. Micro finance is now a major component of banking systems in the developing and under developing world. Microfinance institutions made their mark by using innovative approaches. These institutions gave small loans without collateral, to clients from low-income groups predominantly engaged in income-generating activities in the informal economy (Jayadev, 2016). For long time, it was believed that the free market could not provide financial services to the poor, effectively and efficiently. However, pioneers of microfinance such as those behind Bangladesh's Grameen Bank demonstrated that it was possible to have a 'social business' (Cull, et al. 2009). These organizations were able to provide financial services, most importantly credit, to the poor in a profitable manner that too on a large scale. The formal banking system repeatedly failed on these points because of imperfect information about the borrower's creditworthiness, high transaction costs and lack of collateral.

I. INTRODUCTION

Microfinance has always been seen globally as an important tool for alleviating poverty and financial development. The immense potential for improving financial access was seen as the key strength of the tool. It has been pointed out that that microfinance should not be seen only as an anti-poverty strategy but should be considered as an integral component of a developing country's broader financial development strategy (Barr, 2005). According to Barr (2005), this can take place in many ways. In addition to alleviating poverty and creating livelihoods, microfinance operations can promote market deepening that, in turn, advances financial development. Microfinance also accelerate the growth of the banking sector and help the financial market to mature, especially in developing countries. They can be part of strategies to promote financial reforms in the country as they tend to increase competition and bring about financial liberalization.

The microfinance sector is on the stage of transformation, worldwide, with the integration of digital technologies pushing the sector towards fundamental changes of its characteristics. In this manner. The paper attempts to understand how innovations in digital technology may help the microfinance sector better fulfill its role in the development of India.

The paper based on the framework in World Bank (2016) which identifies the mechanisms through which the developmental process namely innovation, inclusion and efficiency is unfolded. These three mechanisms have been integral to microfinance operations in the past and innovations in digital technology could open up yet another opening for microfinance institutions to promote development.

The digital revolution – digital technologies and pathways to development

Digital technologies are fast spreading across the world and are making their roads into all realms of human life. Digital innovations are creating new channels of engagement, expanding opportunities and increasing efficiency for individuals, businesses and governments. The microfinance industry across the world is also fast adapting itself to technology changes in the financial sector. There is also increased collaboration with fintech companies to better embrace technology. Migration of BC Finance (Myanmar) to a private block chain with the help of Japanese technology firms, and National Payments Corporation of India (NPCI) digitizing MFI transactions using its Aadhar Payment Bridge System (ABPS), are some examples of technology integration (PwC, 2017).

Increased connectivity and technological innovations allow a range of developmental benefits, (World Bank, 2016), which could boost growth, expand opportunities and improve service delivery. As seen in the following diagram Figure 1, digital technologies promote development through inclusion, innovation and efficiency. The improved information flow between different parties facilitates more transactions at reduced cost and risk. As the existing activities become cheaper and quicker, there is also an improvement in efficiency. This happens because growth in information and communication technology allows reduction of existing factors of production and augments the productivity of factors that are not substituted.

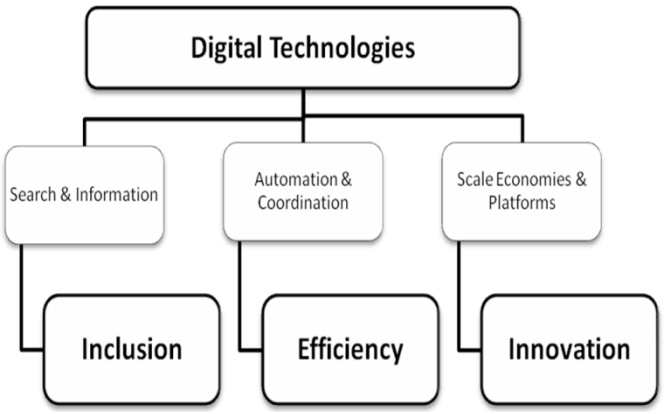

Figure 1: Development mechanisms of digital technology

Source: Adopted from World Bank (2016)

II. INNOVATION

Morduch (1999) comments that, "the promise of microfinance was founded on innovation: new management structures, new contracts, and new attitudes." Mersland and Strom (2012) identify five categories of innovation in microfinance: targeting of poor customers, targeting of women, new lending technologies, new organizational solutions and new sources of funding.

Microfinance provides a solution to traditional problems faced by the banking sector. Before emergence of microfinance, poor customers were served by money lenders or state- owned banks in a situation that was far from an efficient social equilibrium. State-run banks depended heavily on subsidies to cater to this section of customers but had low penetration and repayment rates. Lack of collateral was a large drawback and excluded the bulk of poor. The moneylender loans were more easily available but with high interest rates and a negative impact at large on the society.

On the other hand, Microfinance loans targeted high-risk borrowers, especially women. There was no need for collateral and solved the problems of screening, repayment and auditing. The loans were small and were given for income-generation activities. MFIs also used dynamic incentives, regular repayment schedules, and collateral substitutes to help maintain high repayment rates (Morduch, 1999). The targeting of women was another innovative approach.

The advantages of women-centric businesses were many: from a social perspective, it promoted gender equality, poverty reduction and provided more positive externalities for society and economy.

Much has changed in the microfinance industry over the last two decades: microfinance institutions are no longer exclusive, with the participation of commercial banks increasing. The sector also saw increasing convergence in regulations in the financial sector.

The sector is experiencing what can be termed a 'technological transition' (Geels 2002) - implying not only technological changes, but also changes in user practices, regulation, industrial networks, infrastructure, and symbolic meaning (Geels 2002). The microfinance sector will also have to follow the current trend of integration of digital technology into mainstream financial services, even though they differ. Unlike the financial services sector where there are innovations in both, product and process, the MFI sector is witnessing largely a process innovation (Tidd et al., 2005) with significant improvements in the production or delivery method. Evidently, these changes are not a single event of technical advance but are part of an ongoing cumulative technological advance (Nelson and Winter, 1982) characterized by continuous evolution where new evolves out of old.

III. EFFICIENCY

The biggest roadblock to efficiency in any market is high transaction costs and inefficient use of factors of production. As discussed earlier the financial sector had failed to provide banking services to a large number of people: inefficiencies made transactions in the markets expensive, distorted prices and excluded potential participants. Microfinance lowered transaction costs and made more efficient use of resources employed. These efficiency gains were not limited to the financial sector but included consumers and the larger economy as well. Increased credit availability meant increased economic opportunities and reduced deprivations which could back development.

With commercialization and increased competition, the efficiency in operations which used to characterize microfinance activities came under threat; imposition of rate caps etc., caused a decline in margins in many countries. The Indian case, which we discuss in a later section, is an example for how inefficient operations of even a few in the face of commercialization could create a crisis in the entire sector. Also, as Kent and Dakin (2013) point out, the norms for behavior in microfinance have become less distinguishable from mainstream commercial banking across the world. They have to adhere to standards similar to those in the banking industry and yet deliver in their traditional markets. The fact that the cost of funds to microfinance institutions is much larger compared to their banking competitors complicates it further and warrants significant improvement in efficiency in all realms of operation.
Technology has potential to aid the industry through improvements in efficiency: there is potential to lower transaction costs and increase the productivity of existing factors of production. It has been reported that MFIs handling small transactions for dispersed populations tend to have operating costs in the range of 12-15%, while the same for banks is less than 5%

(Moro Visconti and Quirci, 2014). In the case of MFIs, operating expenses are the most important cost component. Kneiding and Ignacio (2009) based on a sample of 1,003 MFIs in 84 countries find that the three main drivers of operating expense ratio (OER) are relative loan sizes, ages and scale. As per this study these variables impact efficiency in three ways. Firstly, higher numbers of loans may drive scale economies; secondly, higher average loan sizes may improve the cost structure and finally, more knowledge about customers may streamline processes.

IV. INCLUSION

The microfinance sector pioneered financial inclusion with its extension of financial services to the unbanked. The growth of sector was rapid across the world especially in neglected rural areas and among women, both novelties in pro-poor banking initiatives at the time (Mersland and Strom 2012). Microfinance operations, recognized importance of women's participation in financial services and the attendant social benefits. Owing to their participatory nature microfinance operations also successfully complemented the formal banking system and brought more people into its fold. The extensive networks of microfinance organization and unique strategies to cut cost and risk aided the banks in deepening their presence.

As the competition in the sector grew, the social aspect began diminishing as microfinance institutions increasingly targeted clients who were easier to access (Kent and Dakin, 2013), shifting new additions to the consumer pool to the better-off among the poor, or from urban areas, or those who were involved in businesses with rapid turnover, such as retail (Kent and Dakin, 2013). Chasmer (2009) terms this tendency of shifting business to wealthy clients as 'mission drift'. While commercialization and increasing competition may be the most cited reasons, this could also have arisen from the necessity to conform to stringent regulatory requirements such as capital adequacy ratios (Chasmer 2009). It is at this juncture that digital technologies become important, as they provide a means to reach out to the margins and adopt a broader, inclusive business model.

The spread of digital technology will improve inclusion in both, new and existing markets. The World Bank (2016) argues that this happens because some transactions did not exist previously. This could be either because parties of potentially beneficial transactions did not know each other or when one had more information than the other. Digital technologies can solve these problems because they provide access to information and enable searches. The problems in above mentioned cases were not as much related to cost as they were to trust and transparency. Technology innovations make monitoring and sharing of information much easier. User-specific information allows the firms to use newer risk mitigation strategies and provide more individualized services. The increased use of credit bureau data in the Indian market is a good example. The MFIs are actively availing the service of credit bureaus and also contribute to them. Integration with the credit bureau system is highly beneficial to the consumer also, as it considerably eases future engagements with mainstream financial actors.

Advances in technology also allow adoption of a broader view of financial inclusion, taking it beyond mere provision of financial services to the unbanked. Financial inclusion does not mean just access to financial services, but also ensuring continuous and efficient use of these services, which depends on both demand and supply (Demirgüç-Kunt, et al. 2007). Technology innovations have immense potential to address the under banked who might be voluntarily or involuntarily excluded from the system. These innovations differ from others in that they can be more rapidly adopted, and are pioneered largely by

new and small players. MFIs can easily collaborate with the new crop of players to usher in new models of operation and service delivery.

Following the recommendations of the Malegam Committee, the Reserve Bank of India came up with a detailed set of guidelines for the industry and created a new non-banking category for MFIs known as NBFC-MFIs, which has drastically changed the industry's character. Despite its growth, questions remain about the nature of growth and financial inclusion. A quick analysis reveals that the industry is heavily skewed towards large NBFC-MFIs with others lagging behind. As per Sa-Dhan (2017), the total debt funds received by the sector during 2016-17 was close to Rs. 26236 crores excluding SFBs. Out of this 95% went to NBFC-MFIs. In terms of size, the majority of funds (84%) went to large MFIs with a portfolio size above Rs. 500 crores. The industry is also experiencing an escalation in cost of funds: in 2015-16, the cost of funds for MFIs in India ranged from 11% to 15% for different institutions with a median of 13.3% (for all segments) (Sa-Dhan, 2016 b).2 Data from microfinance institutions network (MFIN), the industry body of NBFC-MFIs shows that the average cost of funds has consistently been much smaller for large NBFC-MFIs when compared to midsized or small size institutions (MFIN, various years).

On the inclusion front, the industry had witnessed a brief stagnation in client outreach, especially in 2012 and 2013, but has been growing since then. An important feature of this growth is that the sector has shed its image of being rural phenomenon. The rapid increase in share of urban clientele is certainly noticeable. The share of rural clientele, which was 69%, came down to 33% in 2015. This certainly hints at the possibility of the mission drift (Chasmer 2009) discussed above.

V. DIGITAL TECHNOLOGIES AND MICROFINANCE

It is at this juncture, that the development in digital technology assumes importance: following prevailing trends in the financial sector, microfinance companies are also rapidly adopting digital technology. The need to integrate technology with microfinance operations has been a major policy agenda since the late 2000s. Prior to this, the institutional support programs for MFIs were largely directed at demand-side issues and human resources capacity-building. To understand how technology as a theme permeated into the microfinance sector, past issues of Status of Microfinance3 reports, Bharat Microfinance reports and Inclusive finance reports were analyzed. Technological innovations were found to be a consistent theme in capacity-building programs from the 2003-04 onwards. The aim was to adopt innovations that support outreach and sustainability. This period saw various pilot projects to promote technological integration such as Computer Munshi,4 e-Grama and branch automation.5 While e-Grama was a program for setting up village information centers, the other two aimed at improving the book-keeping and efficiency of field workers. Technology was seen as an instrument or means to improve efficiency, particularly of back- end operations. The clear incentive in terms of efficiency gains was attractive and there was widespread adoption of Management Information Systems (MIS), Automatic Teller Machines (ATMs), Interactive Voice Response (IVR) systems, etc. Specialized software for loan management, accounting, human resources management and monitoring were other technology-based additions introduced during this period. Delfix Nano, Bijli, Ganaseva, Efimo are some examples of software which were adopted by MFIs (Srinivas and Mahal, 2017).

Official policy documents reflect this approach. The Rangarajan Committee Report (2008) on financial inclusion which states the need to leverage technology-based solutions saw it primarily as a tool to reduce transaction costs. The Committee noted that operating costs of small credits were high and varied widely across institutions depending on operating models and cost structure. The recommendations of the Committee also led to the setting up of a Financial Inclusion Technology Fund (FITF) to enhance investment in Information and Communication Technology (ICT).

An important push for technological adoption for many MFIs came via the banking correspondent (BC) partnerships with commercial banks. A technology-based model aimed to increased access of people in remote areas to formal financial institutions (Sa-Dhan, 2017), BC activities have been part of Indian financial services industry since 2006. In this model, the banks are allowed to outsource financial services through business correspondents and business facilitators. MFIs, which had extensive rural networks soon emerged as preferred allies leading to the emergence of 'partnership models' (Nair and Tankha, 2014). The partnership between ICICI Bank and Cashpor with FINO as technology provider is an example of such a model (Nair and Tankha, 2014). The model, mostly promoted by private banks, flourished until the Andhra Pradesh crisis. The BC business thereafter was largely led by corporate BCs (mostly technology service providers) but could not be sustained. With the emergence of NBFC-MFIs, partnership models were eventually revived with more opportunities and increased role for MFIs. Currently, the BC portfolio is one of the most important for MFIs constituting 21% of the total portfolio and 69% of the managed portfolio (Sa-Dhan, 2018a). The BC model also, in many ways, pushed the switch of MFIs to digital as the partnership emerged as a profitable business domain with good returns, especially for the smaller MFIs. As banks had already moved ahead with the use of technology in operations, the BC partnership provided the incentive, motivation and much needed familiarization for MFIs to migrate to newer technology. General Packet Radio Service (GPRS) enabled mobile- based online applications, portable printing devices synchronized with mobile handsets, real- time data transfer to servers, biometric smart cards were a few technology additions whose popularity can be ascribed to the BC role of MFIs and their engagement with banks (Sa- Dhan, 2016). While, on the one hand the BC model fast-tracked adoption of technology-led models in microfinance institutions, it also familiarized the clientele, most importantly rural population, with digital financial services.

A major shift in the approach towards adoption of technology in the MFI sector, however, came only when there was large scale penetration of mobile-based technology at various levels of operation. The larger penetration of mobile technology, internet and mobile banking aided the process, making it clear that technology was the key driver for promoting financial inclusion. In this phase, attention focused on the impact on inclusion, of technology. It was also the period of recovery for the MFI industry as the institutions were actively looking for alternative operational models to improve their reach. This allowed digitization of front-end activities through real-time data entry, geo-tagging, financial literacy videos to educate clients, etc. An early example of mobile technology adoption was that by Sonata Finance Pvt. Ltd. (Sa-Dhan, 2015). One of the first few to use mobile technology in loan approvals and disbursal, the large scale adoption of mobile technology brought in multiple benefits as it allowed the company to track transactions on a real time basis, fetch real-time reports, digitize physical records and improve transparency and process efficiencies (Sa-Dhan, 2015).

Recently a series of innovations is rapidly changing processes within the industry. An example would be increased adoption of cash-lite models for disbursements and repayments by MFIs of all sizes despite concerns of high upfront costs. While these are partly prompted by ongoing innovations in the financial services sector, there are also some other, equally important drivers. The State is a major actor as there is an ongoing policy push for digitization in the country. The Indian Government has pushed digital transformation in the country through initiatives such as Digital India, Digidhan mission, Jan Dhan, JAM trinity. The development of a neutral and open payment ecosystem in the country has proved to be beneficial to the MFI sector. The increased adoption of Immediate Payment Services (IMPS), Unified Payment Interface (UPI) and National Unified USSD Platform (NUUP) is enabling MFIs to provide multiple products and reap the benefits of digital finance. A visible example of transition to digital finance is the increasing proportion of cashless disbursement in total loan disbursement. Sa-Dhan (2018 b) reports that during Q4 of the financial year 2017-18, 45% of the total amount disbursed was cashless. The cashless mode is gaining traction so much that, there have been reports of institutions completely shifting to through cashless mode for loan disbursal and other digital initiatives such as E-KYC (Sa-Dhan, 2017).6 Technological integration is also taking place in the bank-linked SHG sector which tends to lag behind MFI institutions in this respect. The EShakti7 programme of NABARD which attempts to attempts to promote digitization among self-help groups is a noteworthy initiative: the programme aims to address issues of quality of book-keeping, multiple membership of SHG members, credit history of members, etc. Here, technology promotes access to affordable credit by removing information asymmetries holding SHGs back from becoming part of the larger banking system.

Similarly, MFIs are now entering into collaboration with fintech companies. PwC (2017) reports that there are multiple examples of collaboration of MFIs and fintech companies in India for customer on-boarding, credit assessment, loan disbursal and collections. The Entrepreneurial Finance LabEFL, a psychometric credit assessment company providing credit assessment services to Janalakshmi Financial Services (an MFI), partnership between Oxigen Services and Sonata Finance Limited (an MFI) to deliver mobile financial services and education to the latter's clients, Artoo, a technological company helping Ujjivan (an MFI, and now a Small Finance Bank) to on-boarding customers are some of the examples of such collaborations8 (PwC, 2017). These collaborations have not only been innovative but also added to the efficiency of operations and help achieve the objective of the financial inclusion agenda. A major characteristic of these innovative partnerships is that along with improving the current products, they also make a wide array of new financial services accessible to the previously excluded. The growth in credit plus activities (Sa-Dhan, 2107) in India such as micro-insurance and micro-pension are some examples. As of 2017, MFIs had enrolled 14.68 lakh clients for health products and about 51.1 lakh clients for non-health products (Sa-Dhan, 2107).

As discussed earlier, rapid integration of digital technology is causing a process innovation in the industry: field workers may not be displaced completely but their relevance would clearly diminish. The growth in cashless operations and digital payments will curtail the risks of cash-based operations and improve operational efficiency and cost savings. The service provision and risk management would no longer solely depend on physical outreach as many insights can be drawn from the digital data produced in the course of operations. MFIN (2017) reports that organizations which adopted 'cash-lite' models reported reduction in

turnaround time, reduction of risk of errors and fraud in disbursement and repayment, and reduction of reconciliation tasks owing to data shared by technology service providers. Also, there has been considerable change in the engagement strategy of institutions as tools for financial literacy improved significantly. Technology-driven change is taking place not only on digital field applications to on-board customers or improve lead management activities (PwC, 2016) but also through automation and increased reliance on analytics. The ongoing integration of credit bureau data, E-KYC, Aadhar-enabled payments, adoption of self-service options, e-payments, are some other elements of the ongoing transition in the sector. The rapid spread of enabling architecture such as Aadhar and E-KYC will bring huge gains in operating expenses but also might change the drivers of operating expense reduction. A labour-intensive industry, MFI operations also have high costs associated with workforce and their operations. In India, 60% of the total staff is field staff, and the increased use of technology channels such as ATMs, POS machines, mobile banking, etc., can bring about gains in efficiency.

Following the recommendations of the Malegam Committee, the Reserve Bank of India came up with a detailed set of guidelines for the industry and created a new non-banking category for MFIs known as NBFC-MFIs, which has drastically changed the industry's character. Despite its growth, questions remain about the nature of growth and financial inclusion. A quick analysis reveals that the industry is heavily skewed towards large NBFC-MFIs with others lagging behind. As per Sa-Dhan (2017), the total debt funds received by the sector during 2016-17 was close to Rs. 26236 crores excluding SFBs. Out of this 95% went to NBFC-MFIs. In terms of size, the majority of funds (84%) went to large MFIs with a portfolio size above Rs. 500 crores. The industry is also experiencing an escalation in cost of funds: in 2015-16, the cost of funds for MFIs in India ranged from 11% to 15% for different institutions with a median of 13.3% (for all segments) (Sa-Dhan, 2016 b).2 Data from microfinance institutions network (MFIN), the industry body of NBFC-MFIs shows that the average cost of funds has consistently been much smaller for large NBFC-MFIs when compared to midsized or small size institutions (MFIN, various years).

On the inclusion front, the industry had witnessed a brief stagnation in client outreach, especially in 2012 and 2013, but has been growing since then. An important feature of this growth is that the sector has shed its image of being rural phenomenon. The rapid increase in share of urban clientele is certainly noticeable. The share of rural clientele, which was 69%, came down to 33% in 2015. This certainly hints at the possibility of the mission drift (Chasmer 2009) discussed above.

It is at this juncture, that the development in digital technology assumes importance: following prevailing trends in the financial sector, microfinance companies are also rapidly adopting digital technology. The need to integrate technology with microfinance operations has been a major policy agenda since the late 2000s. Prior to this, the institutional support programs for MFIs were largely directed at demand-side issues and human resources capacity-building. To understand how technology as a theme permeated into the microfinance sector, past issues of Status of Microfinance3 reports, Bharat Microfinance reports and Inclusive finance reports were analyzed. Technological innovations were found to be a consistent theme in capacity-building programs from the 2003-04 onwards. The aim was to adopt innovations that support outreach and sustainability. This period saw various pilot projects to promote technological integration such as Computer Munshi,4 e-Grama and branch automation.5 While e-Grama was a program for setting up village information

centers, the other two aimed at improving the book-keeping and efficiency of field workers. Technology was seen as an instrument or means to improve efficiency, particularly of back- end operations. The clear incentive in terms of efficiency gains was attractive and there was widespread adoption of Management Information Systems (MIS), Automatic Teller Machines (ATMs), Interactive Voice Response (IVR) systems, etc. Specialized software for loan management, accounting, human resources management and monitoring were other technology-based additions introduced during this period. Delfix Nano, Bijli, Ganaseva, Efimo are some examples of software which were adopted by MFIs (Srinivas and Mahal, 2017).

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VI. CHALLENGES

While innovation and integration in digital technology has benefits, there are also challenges, some of which are already emerging. The gains from technological integration are far from homogeneous, with mainly the large companies making noticeable efficiency gains. For example, the number of active borrowers served by a single credit officer is more for bigger institutions when compared to their smaller counterparts (Sa-Dhan, 2017). This is because MFIs with large scales of operation were able to put in place systems and processes that significantly reduced the time that credit officers spent with the client (Sa-Dhan, 2017), while the small ones could not do the same. This situation can change if there is larger permeation of cost-effective technological innovations.

Another issue that is plaguing the sector is coping with reducing the 'human touch' element in microfinance operations that distinguished it from the mainstream banking sector, as operations gets increasingly digital. As the sector dealt almost exclusively with small and uncollateralized credit to clients from low-income groups for income-generation activities in the informal economy, it always had the human touch, was, by nature participatory and bottom-up. Though there were only three or four broad models of operation, the way in which each institution approached these models often varied in terms of governance structure, channel and method of delivery, accountability framework and product. The success of the organization depended on how well it understood the clientele and geography in which it is operated. It has been suggested that performance of microcredit organizations not only relies on the macroeconomic and formal institutional environment, but is also closely related to social

beliefs, particularly trust and norms of cooperation (Berggren and Burzynska, 2014). Networks and trust were important to microfinance operations at multiple levels of interaction and were crucial in defining the outcomes. Most importantly, this web of networks built over trust and peer pressure was critical to the efficiency of the firms' operation. Another crucial cog in this ecosystem were field agents and loans officers who built and maintained vital client interfaces that ensured institutional survival (Siwale and Ritchie, 2012). In their primary role as facilitators, field workers ensured extension of micro financial services in an area by helping overcome clients' reluctance to participate, helped loan officers reduce the probability of delinquency and ensured high-quality services (Siwale and Ritchie, 2012) (Fisher and Sriram 2002). The increased adoption of digital technologies threatens the very fundamentals of the industry. How the industry will cope with the changes remains to be seen.

The sector is also facing increased competition from technology-driven fintech companies and universal banks as there is an increasing overlap of markets. Fintech lenders such as Capital Float, Neo Growth Credit Limited, Indifi Technologies Pvt Ltd. are also providing micro credit to under-served and un-served markets (PwC, 2017). The increased collaboration between commercial banks and fintech startups also intensifies the competition. These new partnerships allow banks to overcome the earlier drawbacks of cost and informational asymmetry to better target previously left out clients. Though the indirect competition is not intense at the moment, digital innovations are fast blurring the boundaries within and outside the market.

VII. CONCLUSION

The microfinance sector is on the cusp of a transformation, worldwide. The integration of digital technologies is pushing the sector to a transformation which might affect its fundamental characteristics and organizational processes. While the integration of technology can promote development through innovation, efficiency and inclusion, the path ahead for the sector may not be smooth. How the innovations will pan out and impact the sector warrants more detailed enquiry. While the quantum of benefits is unclear, it can be said with certainty that technological advancement alone will not bolster development. What is equally important is the nature of competition and challenges. There is possibility of a digital divide (Word Bank, 2016) as bigger firms are in a better position to integrate technology faster and more efficiently. Inequality in access and barriers to productive use are also stumbling blocks in realizing efficiency gains put forth by technologies. Such problems are more pertinent in case of technologies whose gains are a consequence of networks effects that arise when a large number of people use it. The skills and logistics already in place are thus very crucial. It has to be remembered that the realization of developmental benefits is far from automatic and depends on the country-specific business climate, regulatory framework and skill level of labour force.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Emotional Intelligence : A Comparative Study on the Selected Public (SBI) and Private (Federal Bank) Sector Banks with Special Reference to Ernakulum District

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ABSTRACT

Banking sector is one of the leading sectors with immense potential and strength and at the same time facing serious HR issues. This study focusing on the Emotional Intelligence (EI) of the employees in the selected private and public sector banks. There is stiff competition between banks with significant difference in employee's attitude and behaviour. This study mainly accessing emotional intelligence (EI) of employees in selected public and private sector banks. The objective of the study is to understand the theoretical concept of Emotional Intelligence. To access the level of Emotional Intelligence among the employees of selected public (SBI) and private sector banks (Federal bank). To compare the dimensions of EI namely Self Awareness (SA), Emotional Resilience (ER), Motivation (M), Interpersonal Sensitivity (IS), Influence (I), Intuitiveness(In), Conscientiousness(C) and to examine the relationship between Emotional Intelligence and job satisfaction to make suggestions and recommendations based on the study.

Keywords: Emotional Intelligence (EI), Emotional Quotient (EQ), Intelligence Quotient (IQ), Emotional Intelligence Quotient (EIQ), Emotional Resilience.

I. INTRODUCTION

Emotional intelligence is the ability to identify understands and manages emotions. The measure of emotional intelligence is termed as Emotional Quotient (EQ). Higher the EQ greater is the control over emotions. In today's high pressure cut-throat competition people with high EQs are preferred. It is even said that the high IQ for which you are hired and the low EQ for which you can be fired from the job. Being emotionally intelligent doesn't mean. That being without emotions. It simply implies that person's has greater ability to distinguish between functional and dysfunctional emotions and being able to regulate them as per the required situations. The service sector especially banking sector employees need adequate Emotional Intelligence (EI) because their dealings with customers has significant influence on the success of the bank as well as customer employee satisfaction

A. STATEMENT OF THE PROBLEM

This project is on the topic "EMOTIONAL INTELLIGENCE" A comparative study on the selected public (SBI) and private (Federal bank) sector banks with special reference to Ernakulum district. This study mainly focuses on the emotional aspects of the employees in public and private sector banking institutions mainly limited to State Bank of India (public) and Federal bank (private) with special reference to Ernakulum district. The performance of each employee has adverse effect on the customer's satisfaction. There is an emotional relationship between both the parties in the sector.

B. SIGNIFICANCE OF THE STUDY

Banking sector in India is one of the leading sectors with immense potential and strength and at the same time facing serious Human Resource (HR) issues. Their study focusing on the Emotional Intelligence (EI) of the employees in both private and public sector banks there is stiff competition between banks with significant difference in employee attitude and behaviour. This study assessing Emotional Intelligence (EI) of employees in selected public & private sector banks. The results of the study enable policymakers, managers to improve the EI of employees and efficient management of employees.

C. OBJECTIVES

To access the level of Emotional Intelligence among the employees of selected public (SBI) and private sector banks (Federal bank).

To compare the dimensions of EI namely Self Awareness (SA), Emotional Resilience (ER), Motivation (M), Interpersonal Sensitivity (IS), Influence (I), Intuitiveness(In), Conscientiousness(C).

To examine the relationship between Emotional Intelligence and job satisfaction.

II. METHODS AND MATERIAL

A. METHODOLOGY

The research is mainly descriptive in nature and revolves around addressing objectives like assessment of level of emotional intelligence amongst the employees of services sector, to find the important factors that are responsible for emotional intelligence and to find ways to improve emotional Intelligence. The sample size for the study was 120 and sampling frame was the employees of State Bank of India and Federal Bank in the Ernakulum district.

Non-probability convenience sampling was used for the purpose of data collection. The Emotional Intelligence questionnaire chosen for the study provides a quick profile of the respondents' EI Collection of data includes both primary data and secondary data. The researcher has collected both of the above data .The data collected constitutes both primary and secondary data.

Primary data- Primary data are collected through observation, direct communication with respondent, and finally by distributing questionnaire to using customer of personality products. The sampling method used in the study was random sampling.

Secondary data-Secondary data were collected mainly from company records and journals research reports, newspapers, magazines also provided information about products and company. Information from company's websites also provided secondary data.

B. REVIEW OF LITERATURE

Anurag Pahuja (2012)

Conducted a study to reveal the perception and factors affecting emotional intelligence among selected bank employees. The study revealed that employees are aware of the EI concept. There is significant difference between male and female on various EI traits. Females scored better on overall emotional intelligence than males. The employees are not emotionally stable which really concerns as it

affects their performance. The study highlighted that employees consider self-management, self-awareness and empathy as the major emotional intelligence traits required by everyone.

Atuma Okpara (2014)

Studied the impact of workplace emotional intelligence and return on investment in the Nigerian banking industry. Study revealed that is strong relationship between workplace emotional intelligence and return on investment. Findings indicated by increasing the manager's abilities of self-control, trustworthiness, conscientiousness, adaptability, achievement drive and initiative so also will the return on investment increases.

Bhatia, Deep & Sachdeva (2012)

Studied the relationship between job involvement and organizational effectiveness among employees at Punjab National Bank. The research inferred a direct relationship between job involvement and organizational effectiveness through employees' working style, approach towards the attainment of organizational goals, quality improvement, acquisition of new talent and skills etc.

III. RESULTS AND DISCUSSION

A. SCALES OF STUDY

EMOTIONAL INTELLIGENCE (EI): According to Dr. Daniel Goleman "Emotional Intelligence is a person's ability to manage his feelings so that those feelings are expressed appropriately and effectively"

EMOTIONAL QUOTIENT (EQ): The level of a person's emotional Intelligence, often is represented by a score in a standardized test. This score is called Emotional Quotient (EQ).

INTELLIGENCE QUOTIENT (IQ): It is a total score derived from several standardized tests designed to assess human intelligence. It is the score obtained by dividing a person's mental age score, obtained by administering an Intelligence test, by the person's chronological age, both expressed in terms of years and months. The resulting fraction is multiplied by 100 to obtain the IQ score.

EMOTIONAL INTELLIGENCE QUOTIENT (EIQ): It is the capability of individuals to recognize their own emotions and those of others discern between different feelings and label them appropriately, use emotional information to guide thinking and behaviour, and manage and/or adjust emotions to adapt to environments or achieve one's goals.

SELF-AWARENESS: It is the ability to understand your own emotions and their effects on your performance. You know what you are feeling and why—and how it helps or hurts what you are trying to do.

EMOTIONAL RESILLIENCE: It refers to one's ability to adapt to stressful situations or crises. More resilient people are able to "roll with the punches" and adapt to adversity without lasting difficulties; less resilient people have a harder time with stress and life changes, both major and minor.

MOTIVATION : It is the word derived from the word 'motive' which means needs, desires, wants or drives within the individuals. It is the process of stimulating people to actions to accomplish the goals.

INTERPERSONAL SENSITIVITY: It has been suggested that interpersonal sensitivity, a personality trait associated with depression and anxiety disorders, is linked with attachment insecurity. To confirm this link, we studied the correlations of interpersonal sensitivity with working models of the self and other.

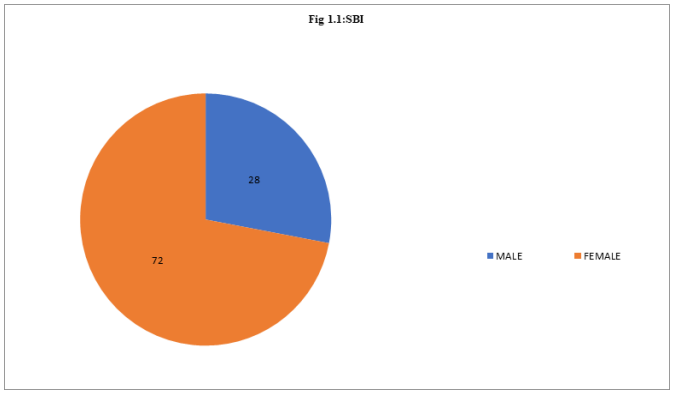
INFLUENCE: Influence is a social competency. Leaders who are equipped with the emotional self-awareness and self-control to manage them while being adaptable, positive, and empathic can express their ideas in a way that will appeal to others. Influence is necessary for any leadership style, and can be done in a way that is meaningful and effective or fraught with resistance.

CONSCIENTIOUSNESS: It is the personality trait of being careful, or diligent. Conscientiousness implies a desire to do a task well, and to take obligations to others seriously. Conscientious people tend to be efficient and organized as opposed to easy-going and disorderly. They exhibit a tendency to show self-discipline, act dutifully, and aim of achievement; they display planned rather than spontaneous behaviour; and they are generally dependable. It is manifested in characteristic behaviour's such as being neat, and systematic; also including such elements as carefulness, thoroughness, and deliberation (the tendency to think carefully before acting.

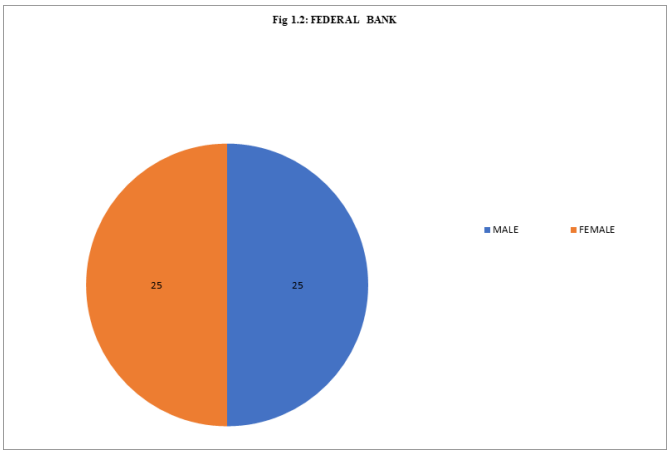
INTUTIVENESS: Intuitive means having the ability to understand or know something without any direct evidence or reasoning process.

B. DATA ANALYSIS AND INTERPRETATION

1. GENDER OF RESPONDENTS

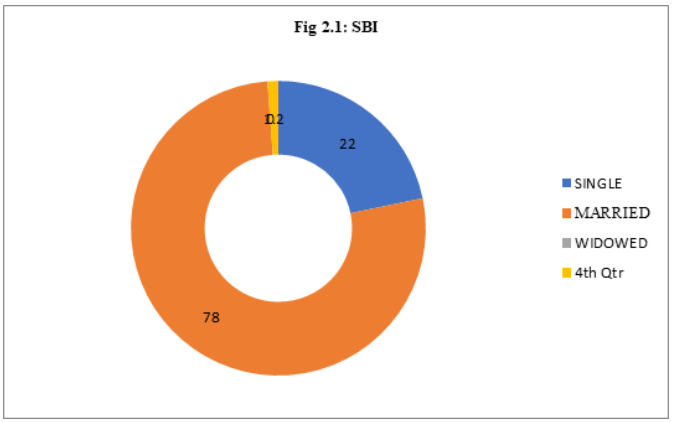


INTERPRETATION:-The above figures represent that out of 50 respondents surveyed 28% are male and 72% female.

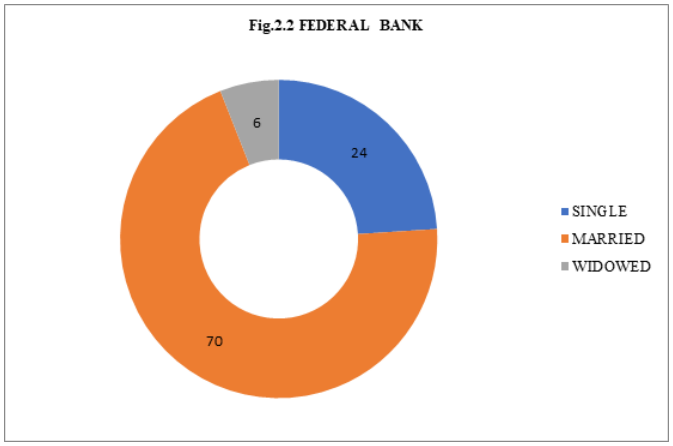


INTERPRETATION:-Here we have equal number of respondent's out of 50 respondents surveyed. The data represents 50% of male and 50% of female employees.

2. MARITAL STATUS OF RESPONENTS

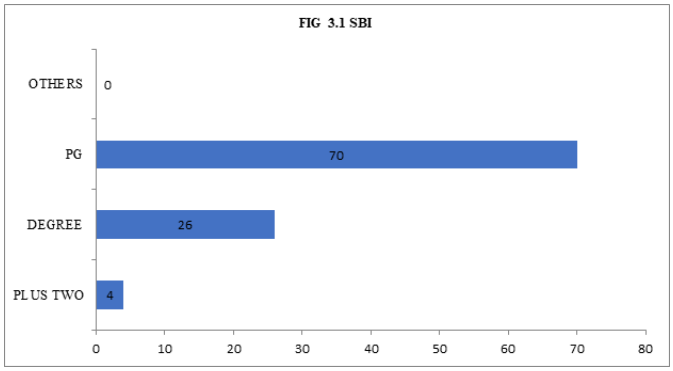


INTERPRETATION:-The above figure represent that out of 50 respondents surveyed 22% are single and 78% is married.

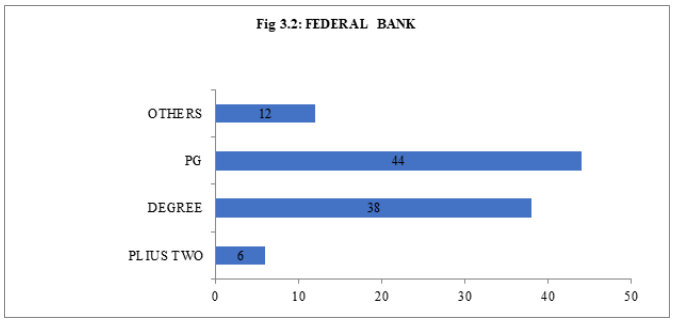


INTERPRETATION:-The above figures represents that out of 50 respondents surveyed 70% are married, 24% are single and 6% is widowed.

3. EDUCTIONAL QUALIFICATION OF RESPONDENTS



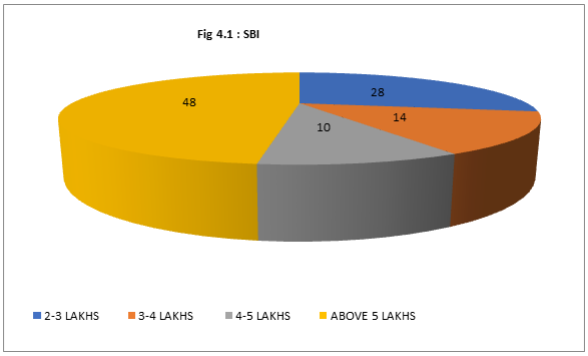
INTERPRETATION:-The above figure shows that 4% of the respondents have completed plus two, 26% are graduates and 70% are postgraduate.



The above figure represent that 6% of the total respondents have qualified plus two, 38% have completed their degree, 44% are post graduates and 12% of them have other qualifications.

4. ANNUAL INCOME OF RESPONDSENTS

The above figures represents out of 50 respondents 28% get an annual income between 2-3 lakhs, 14% between 3-4 lakhs, 10% between 4-5 lakhs and 48% get an annual income above 5 lakhs

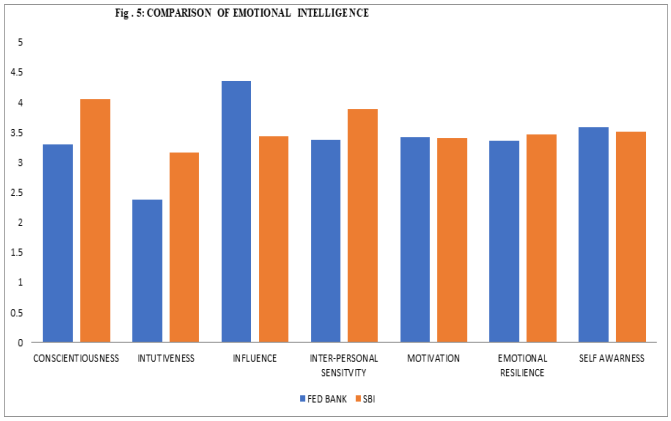


INTERPRETATION:-The above figures represents out of 50 respondents 28% get an annual income between 2-3 lakhs, 16% between 3-4 lakhs, 33% between 4-5 lakhs and 34% get an annual income above 5 lakhs.

Table1.1: Overall Emotional Intelligence Scale

COMPARISON BETWEEN SBI AND FEDERAL BANK

Components	SBI	FEDERAL BANK
Conscientiousness	4.04	3.33
Intuitiveness	3.16	2.38
Influence	3.42	3.26
Inter-personal Sensitivity	3.88	3.38
Motivation	3.40	3.42
Emotional Resilience	3.46	3.35
Self-Awareness	3.50	3.58
Total	3.55	3.24



INTERPRETATION:-From the above figure we can conclude that both the employees of SBI and Federal Bank have moderate level of Emotional Intelligence. There are slight differences in some of the elements. The level of Self Awareness, Emotional Resilience, Motivation and Influence are almost the same in both sectors. Whereas we can see a visible change in the levels of Inter-personal sensitivity, Intuitiveness and conscientiousness, employees of SBI being on the higher levels. The total graph also shows that the level of Emotional Intelligence is more in the employees of SBI when compared to Federal Bank.

C. LIMITATIONS

1. The study is restricted to respondents from Ernakulum district only. The view of other areas is not taken.
2. Time allowed for the study was not sufficient to cover the market area.
3. Sample size was 100, so arise of sampling may have an adverse impact on findings

D. FINDINGS

- Majority of the employees of the public sector are female (72%), whereas private sector banks have equal male and female employees.
- Both sector employees are highly educated with a post-graduation.
- Annual income of both banking sector are above 5 lakh.
- While comparing the level of self-awareness there is only a minor difference between the two.
- Emotional resilience level of both the banking sector is comparatively the same.
- Level of motivation acquired by the employees is also comparatively the same between the two.
- Interpersonal sensitivity was found to be the same but when it comes empathising with customers public sector employees are more empathetic.
- When it comes to level of influence the public sector employees listen to others perspectives before making decisions.
- Public sector employees are more spontaneous.
- Level of conscientiousness is more or less equal
- It was found that in both the sectors the employees were not confident about their personality.
- In the overall examination of the study the level of interpersonal sensitivity, intuitiveness, and conscientiousness was higher for public sector when compared to private sector.
- Overall job satisfaction is equal for both sector employees.
- A minor rate of public sector employees find that it is meaningless to work in this sector whereas may like what they do. Some of them are unsatisfied with their pay.
- It was found that the employees having moderately high level of Emotional Intelligence were also satisfied with their job.

E. SUGGESTIONS

- Employees must be given training and orientation classes to enhance their emotional intelligence level
- Employees must be taught to respond instead of reacting to conflict.
- Help them to develop listening skill. It would help them to understand better and respond properly with respect for the person they are speaking to.

- Keep employees always motivated.
- Train then to empathise with others it helps them to relate to others in basic human level.
- Make the employees to take responsibility for their feelings and behaviour.
- Develop a positive attitude towards life situations.
- Conduct interactive sections were each employees can interact and get to know his or her co-workers apart from work.
- Enable the employees to turn their criticism and challenges into opportunities.
- Employees must be taught the importance of being socially and ethically responsible.

IV. CONCLUSION

The broad objective of this study was to compare the level of emotional intelligence between the employees of public and private sector banks. Emotional intelligence is emerging as a critical factor for sustaining high performance. The work in the banking sector is highly stressful. Employee's come in contact with hundreds of customers each day. Only having a high level of EI would help them to balance their work and life moderately.

Through this study it was found out that employees of both the sectors have a moderate level of emotional intelligence however there were some visible variations in some factors. The level of self-awareness and emotional resilience motivation and influence were found to be almost the same.

The employees of public sector banks have a comparatively high level of interpersonal sensitivity, intuitiveness, conscientiousness than private sector banks employees. The overall EI is less for private sector banks (federal bank). Job satisfaction and EI are inter-related so more studies are to be conducted in the field of Emotional Intelligence (EI). In order to improve the Emotional intelligence aspects of the employees the Human Resource (HR) department should undertake various programmes for the employees.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

A Study on Water Management an Upcoming Business Opportunity in India

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ABSTRACT

Water is one of the basic needs of a human being. So water has a economical role in the economy. Unfortunately India is in 13th position in the extremely high water stressed countries categorised by WRI Aqueduct Risk Alta's in 2019. To solve this issue a new method was introduced and it was success in it and it turned into a business opportunity called water management. In this present scenario the concept of water management play a pivotal role in in the country. Water management business is a sustainable business opportunity, which not only focuses on profit making it also concentrate on the welfare of the society. Water management is a sustainable business opportunity that will not harm the environment instead of that it tries to reconstruct the nature and its gift for the next generation. The study was conducted to study the new business opportunity called water management. For this study, data were collected through questionnaire from general public and interview schedule from firms. There were total of 150 respondents from general public and 6 firms. From the study we can understand that the growth and scope of these firms in present scenario. From this study it is clear that the water managements have future scope and these firms show an increasing profit trend in their business. Lack of promotion activities is one of the drawbacks of this business. The firms have to use more promotional tools for retain their business and for expanding their market.

Keywords : Water Management, Water Shortage, Sustainable Business Opportunity, Welfare of Society.

I. INTRODUCTION

Water is one of the basic needs of a human being. Water is used for personal consumption and other activities. Water is an economically strategic resource. Some of the major sources of water are rain natural water bodies and underground water etc. but due to over use depletion of underground water and climatic changes leads to water shortage in the country.

According to WRI Aqueduct Risk Alta's2019 categorised 17 countries has extremely high water stressed countries and India is in 13th position in this list. World Bank also warned in the last year about water stress because of the over exploitation of underground water. Surface water and underground water is highly exploited for their needs. It is reported that underground water was reduced to 80cm per year between 1990 and 2014 in north India. But now it is reducing again not only in northern state, but also in southern states too. To solve this problem in new method was introduced and it was succeed in it and become a new business opportunity called water management.

"Water Management is the activity of planning, developing, distributing and optimum utilization of water resources." World Water Development said

reusing the waste water can be one of the solutions for this crisis. By reusing the waste water, over exploitation of underground water will be reduced and ensure water security. Several Arab countries were reuse about 80% of waste water. Oman reuses 78% of waste water by recycling.

The supportive rules and policies implemented by government for constructing water treatment plant enabled the water management firms to make huge profit by a change by bringing a change in the attitude of the society and developing a sustainable society. Water treatment plant, sewage treatment plant and water filtration plant etc. are some of the major products of offered by water management firms. Water management is a futuristic business opportunity that has a long-term demand in the market, because the demand for fresh water will increase day by day and its availability is decreasing.

A. REVIEW OF LITERATURE

- As per the article "water management in post 2020 world" by Cecilia Tortajada & Asit k Biswas (5th November 2020) , in the post 2020 world, demand and supply I will have to be treated as two sides of the same coin if urban Water security is to be assured.
- As per the article, "Green solutions are critical for sustainable water management in India" in The Hindu (3rd November 2020), highlights the importance of UN's SDG 17 that focuses on sustainable development through global partnership are the critical to the success of sustainable water management.
- As per the article "just eight months after the flood, Kerala is reeling from a severe water crisis, what's gone wrong?" by T A Ameerudheen (21st may 2019), after flood Kerala received 80% less rainfall and this results in reduction of underground water level and water scarcity. The article points out deforestation, pollution are some of the reasons behind water scarcity.

B. RESEARCH GAP

The above mentioned reviews are analysed for studying the source of water management and its effectiveness in world. Researcher is considering the sampling area of Ernakulam District for analysing the water management and upcoming business opportunity and studies the scope of this in Kochi city.

II. METHODS AND MATERIALS

A. STATEMENT OF THE PROBLEM

Increasing urbanization and our modern way of living place created a heavy demand on water supply in India and especially in Kerala too. To solve this problem some group of entrepreneurs identified a new business opportunity called water management which is sustainable to society and environment. It helps to gain profit along with sustainable business operations.

B. OBJECTIVES OF THE STUDY

- To check the awareness level of society about water management.
- To identify the growth trend of water management firms.
- To identify the scope of water management firms in present scenario.

C. RESEARCH METHODOLOGY

To pursuance the above mentioned objectives, the researcher used both primary and secondary data for the purpose of study

1) SAMPLING METHODOLOGY

- Sampling size: due to the limitations of time and cost, the researcher chooses only 150 samples and 6 firms for the study.
- Sample area: The researcher chooses Ernakulam District as the sample area for the study.

2) DATA COLLECTION

- For primary data collection, convenient sampling was used for collecting data from general public and purposive sampling for collecting data from firms. It was collected through questionnaire and interview schedule.
- Secondary data was also used for completing the study. For that, it was obtained from research papers, Articles, newspapers, internet

III. RESULTS AND DISCUSSION

A. RESULTS

LEVEL OF WATER SHORTAGE IN LOCALITY

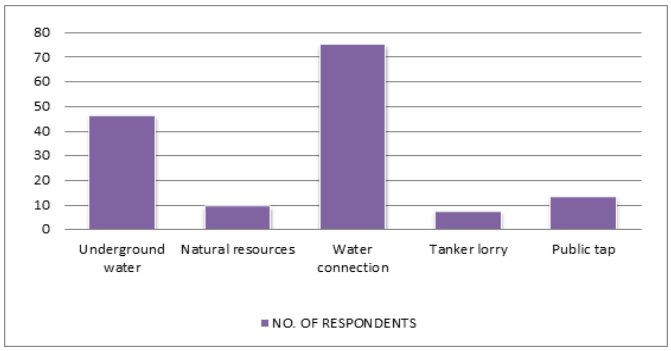
CHOICE	NO. OF RESPONDENTS
Yes	62
No	64
Neutral	24
TOTAL	150

Source: primary data

INTERPRETATION

The majority of the respondents (general public) didn't experiencing water shortage in their locality. But other experiencing water shortage in different circumstances.

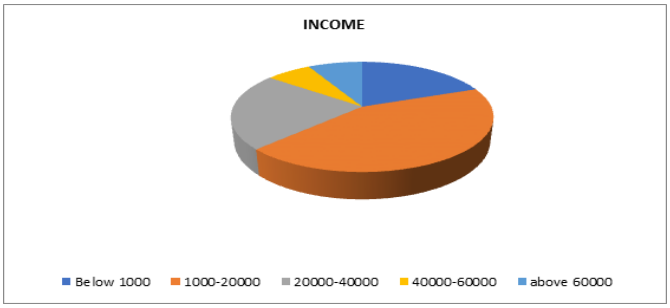
AVAILABLE WATER SOURCES IN THE LOCALITY



INTERPRETATION

The majority of respondents depend on water connection from water authority as a source of water. In some regions, the respondents use natural and underground water for their water requirements.

INCOMEWISE CLASSIFICATION

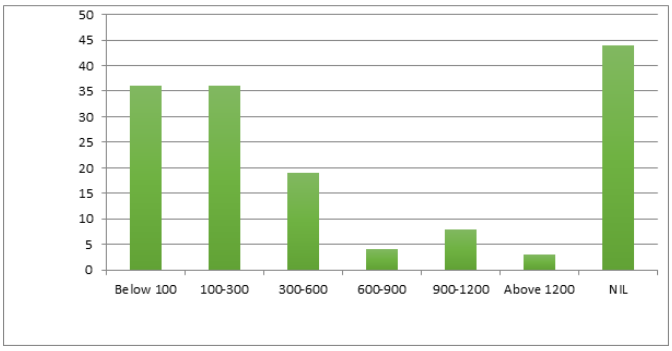


Source: primary data

INTERPRETATION

The selected respondents are belonging to a income group of 1000-20000. Only few respondents have above 60000. This is clear that the sample representing the population who have an average income per month.

AMOUNT SPEND PER MONTH FOR WATER REQUIREMENT

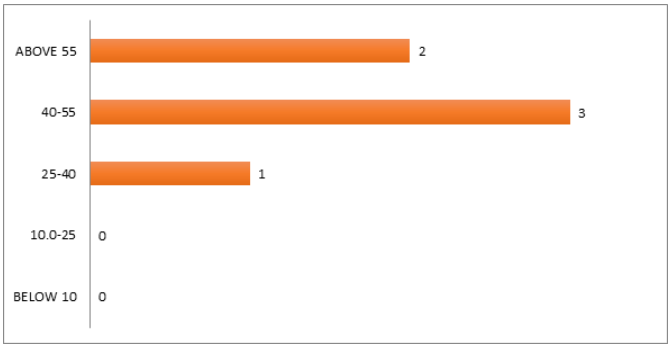


Source: primary data

INTERPRETATION

The amount spends by the respondents for meeting their monthly water requirement were ranges up to 300 rupees. Above 40 respondents have not incurring any cost for water requirements?

ANNUAL TURNOVER OF THE FIRMS

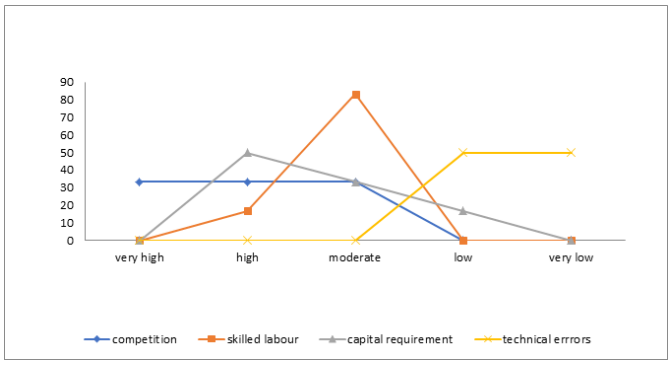


Source: primary data

INTERPRETATION

From analysing the data it is clear that the majority of selected firms show that the annual turnover of the firms ranges between 40 lakhs to 55 lakhs. And 3/8 of the firms have annual turnover is above 55 lakhs.

MAJOR PROBLEMS FACED BY FIRMS



Source: primary data

INTERPRETATION

The major challenges faced by water management firms are capital requirements. Finance is the life blood of a business. Another challenge is availability of skilled labour.

REMUNERATION RECEIVED BY FIRMS

Plot area (in sq.m)	Remuneration	Residential building	Hospital, Hotels, Educational institution	Industries
300-2000	Nil	5	6	6
	10000-50000	1	0	0
	50000-100000	0	0	0
2000-4000	Nil	4	3	4
	50000-100000	2	2	0
	100000-125000	0	1	2
400-6000	Nil	4	2	2
	75000-125000	2	3	3
	125000-175000	0	1	1
6000-8000	Nil	4	0	0
	100000-125000	1	1	1
	125000-175000	1	5	5
8000-10000	Nil	1	0	0
	150000-200000	5	1	1
	200000-250000	0	5	5

INTERPRETATION

The data is collected from 6 various firms who practicing different methods and services. So the remuneration charging for each service is different some firms provide services to huge building like industries hotels, educations etc. Majority of firms provide services to urban areas, where the plot area is above 2000 square feet. The remuneration can been fixed due to change in technologies, area, and external factors objectives of firm and cost of water treatment equipment etc. Because of this the firms have given an approximate chargeable amount from customer. The remuneration will lie between these ranges.

B. FINDINGS

The Study is conducted using both primary and secondary data collection methods. For primary data collection, a questionnaire was prepared and distributed among the sample of 150 people and a interview scheduled questionnaire was given to 6 water management firms in Ernakulam district. The secondary data was collected by referring books, journals, articles etc. From these data, an analysis was made and the following findings were made.

Most of the respondents were male. The monthly total income group of the majority respondents 2000 to 20000. From this study it was clear that about 41.33% of respondents experiences water shortage in their locality and 16 % of respondents are neutral, they experience water shortage as the situation may occur. Half of the respondents depends on water connection from the water authority, 30.6 7% of respondents using underground water, 4.67 % and 8.67 % of respondents uses tanker lorry and public tap for meeting their water requirements. The respondents who use underground and natural resources for their water requirements does not incur any cost, but other respondent spend up to rupees300 per month for water expenditure. About 57.33% of respondents are thought about water recycling but only 10% of

respondents approached water management firms for water recycling and other water related activities.
Majority of the firm are expecting high water shortage. The annual turnover of 50% of firms ranges between 50-55 (in lakhs), the firms are medium and large scale business. The firms are using owners fund for meeting their working capital requirements and make technology updation monthly for their working. The major clients are hotels, flats, hospitals etc. Some of the clients are Apollo builders, Sai hospital, Mazhavil manorama, Lakshmi hospital etc. Most of the firms are using direct feedback mechanism to collect customer feedbacks and customers are highly satisfied with the firm's product and services. The competition in this field it is depends upon the size of the business. Skilled labour requirement and capital requirement is the major challenges faced by firms. Internet and brochures are mainly used as a advertisement tool. The firms are not getting any financial assistance from government or they are not aware about any financial assistance given by government. The profit margin of the firms shows a increasing trend. The remuneration charges are depends upon the size of the building and plot area.

C. SUGGESTIONS

- The water management firms have to use more advertisement tools for promoting their business
- Create awareness among customers about water recycling and its merits

IV. CONCLUSION

In present scenario the availability of water is decreasing and it will continue in the upcoming years. Water management business is one of the solutions for water shortage. So the demand for water management business will be high in future. The water management firm can gain huge profit by utilizing this issue. The water management firms have to identify the profitable market. The major reason for the water management firms is that the general public is properly aware about this business opportunity. Due this drawback the come people are spending a huge portion of their income for eater. Proper advertisement should be adopted for effective functioning of the business. The government also have to promote this business opportunity.

A. LIMITATIONS OF STUDY AND SCOPE OF FUTURE STUDY

The main limitation of the study was time. Due to short period of research a deep study cannot be made. Another limitation was the location of the study. The study was limited to Ernakulam District and the collected data cannot represent the all population. The study area (water management firms) was limited due to location of study. Therefore, the future research can be conducted by taking a large population and sample there from. A comparative study can be done by adding different dimensions on water management.

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Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Revolutionization of Online Educational Platform with the Outbreak of Covid19

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ABSTRACT

Though 2019 pandemic had created many problems in routine lives of people. We find means and ways to survive the plight and the implications of the pandemic. The restrictions from the authority and the COVID19 protocols had made people shut themselves in their homes and places where they stay, restricting the free movement of the people in and around to control the virus infection and transmission. Our routine lives were brought to standstill by this microscopic villain. Amidst all these, the student category also had to bear the plight of the pandemic; their academic progress was a big question. They had to make themselves adapt to the novel technologies in the field of education.

The online mode of education was not introduced with the outbreak of novel corona virus. It had its existence even before the outbreak of the pandemic. But the novel corona virus made revolutionization of the existed online academia and its further enhancement. There are now available a wide variety of online tutors to teach us various disciplines at our budgets and they also provide us with attractive packages and offers, urging us to subscribe to their services. These services are now available for kindergartens to high level professional tuitions and for competitive examinations. Due to the pandemic protocols and restricts government also had to digitalize the education with the help of television channels and other medias. And students and academicians are also making a progression in academia with the introduction of technology in education.

In our study we try to analyse the pre- and post-condition of online academia and how the outbreak of pandemic has revolutionized the online educational platforms.

KEYWORDS : COVID19, Online Education, Academia, Technology, Revolutionization

I. INTRODUCTION

The pandemic had brought the world to standstill. It denied free movement of the people and put many restrictions in the routine life of us all, irrespective of our caste, creed, colour, age, gender or geographical location. All of us had to abide with the COVID19 protocols and restrictions imposed by the authority to in order keep ourselves protected from getting infected with the novel corona virus.

Though our lives were tough on those days, somehow, we had to overcome every inch of it. The educational sector also had to bear the plight. The student community were ambiguous about how their future

would be; further the fear of disease and the lockdowns put the students in the shackles of the stress and apathy, which took the lives of many. The students of the low income earning families were more prone to this scenario. This emptiness gave rise to scope and uprising of the online mode of education for pupils from kindergartens to high level competitive examinations. Online educational platforms were not a novel mode but it had marked its existence even before the outbreak of COVID19, but during the pandemic this sector had an accelerated growth. The restrictions and the protocols of the pandemic could identify this big possible opportunity into a revolution. Premium services through apps and other means, free access apps, YouTube channels, social media pages, TV channels and various other applications and products paved way to access education and infotainment. This made us to access to courses to our preference, from free to paid versions. Also geographical location was no longer a barrier in order to access education or coaching from a place where we loved to get enrolled. The concepts were made clear to students and academicians with the help of the novel technologies and personalized mentorship of experts. But however, these were accessible only to those could afford. So free and focused classes have to be made available to such children, so, the government and various stakeholders launched free accessible TV and YouTube channels for such purpose and the students could also get the personalized services of their teachers with the help of the various applications etc. However, online classes had its pros and cons.

And in this study we try to analyse these online educational platforms in the pre and post pandemic period and also how it had contributed in revolutionizing this online mode.

A. SIGNIFICANCE OF THE STUDY

The outbreak of the novel corona virus was not on the schedules of the world and the hopes of race for a cure or prevention is still at unclear state. And it had made our lives as uneasy as we were restricted to move freely as part of the COVID19 protocols.

The educational sector had to face this plight and the students and the learners were put into troubles as they feared about their state of their educational progression. This opportunity made a possibility to seize the educational sector and to tackle down the economy with the latest versions of online education. Even though it had seized the market before the pandemic, the outbreak of the novel corona virus revolutionized this possible opportunity. So, here we focus to learn about the pre and post acceptance of such online educational platforms and to learn how this became popularized with the outbreak of COVID19.

B. OBJECTIVES

- To analyse the pre- and post-condition of online academia.
- To study how the outbreak of pandemic has revolutionized the online educational platforms.

C. REVIEW OF LITERATURE

- As the pandemic had disrupted the routine life of the routine life of us all, he educational institution also had to move to the online educational platforms, to cater to the needs of students from kindergartens to university levels. Also the government and the various stakeholders are doing their best to provide students with online educational facilities. (Dr. Anviti Singh, financialexpress.com July 13, 2020)
- COVID19 pandemic threw over 1.2 billion of students from their classrooms shutting all schools globally and as a result educational system was dramatically changed with the newer e-learning technologies. Even before the pandemic these online educational platforms showed a growth,

whose invested globally reached US$18.66 billion in 2019. (world economic forum, website)

- The offline class experiences and the personal touch cannot be replicated with the online means of education. (India today, India today web desk, dated Oct.20, 2020, New Delhi)
- Union human resource department ministry provided a new set of various e-platforms for students such as the SWAYAM Moocs courses, DIKSHA, CBSE podcast, National Digital Library of India, Vidwan etc. (Nandhini, Hindustan Times, E-paper, dated April 12,2020)

D. LIMITATION OF THE STUDY

- Time was a constraint in carrying on the study in a more precise manner.
- Lack of patience of the respondents might contribute to the biasedness of the so collected data.
- Poor connectivity was a problem faced by the respondents in submitting their responses.

II. METHODOLOGY

For the purpose of the study primary as well as secondary data were used.

Primary Data: Data was collected from various respondents from the students, other learners etc. with the help of mailed questionnaire.

Secondary Data: Data were collected from appropriate and authenticated online newspapers, journals, magazines, websites etc.

Sample size: Sample data was collected from about 100 respondents in and around Ernakulam city and parts of Kottayam and Alappuzha.

Tools used for analyzing the collected data: The following tools were made used in order to analyse the so collected data with the help of mailed questionnaires.

- Percentage analysis
- Diagram

III. RESULTS AND DISCUSSION

A. DATA ANALYSIS AND INTERPRETATION

Online Educational Platform means the process of educational services are catered to the beneficiaries through those novel technological modes and means. And with the outbreak of the pandemic we see a steady and rapid growth in the online educational sectors. This eliminated the geographical barrier, allowing the learning community to seek things of their interest on their palmtops from where ever they were.

Respondents consisted of pupil from upper primary to post graduates and other learners who avail competitive examination coaching and other linguistic courses.

Preference of Online Education

Mode	Online	Offline
Percent	40%	60%

Among the respondents the statistics of the online class preference is distributed as follows;

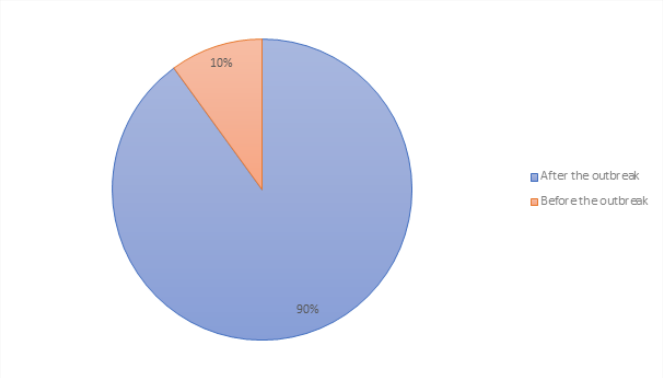
CLASS	In per cent
UP/HS	7%
HSS	15%
Graduates	25%
Masters	21%
other learners	32%
Total	100%

Source: Primary data

From the above data we see that most of the students opt for offline classes (60%) rather than online classes (40%).

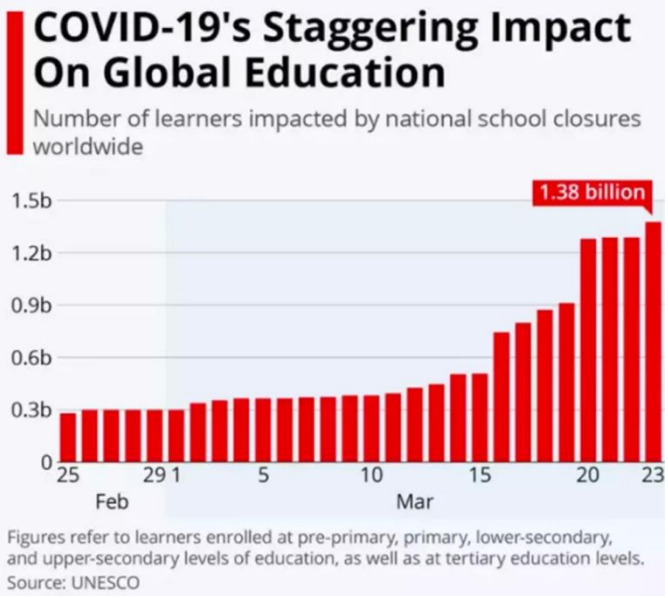
This is because the personal experience and human touch and emotions could not be transferred through technology. Pupils want to get educated along with which they prefer to keep some human interactions personally without a technological medium. But they are not undercivilised to ignore technological advancements completely.

Usage of Online Educational Platforms



Source: Primary Data

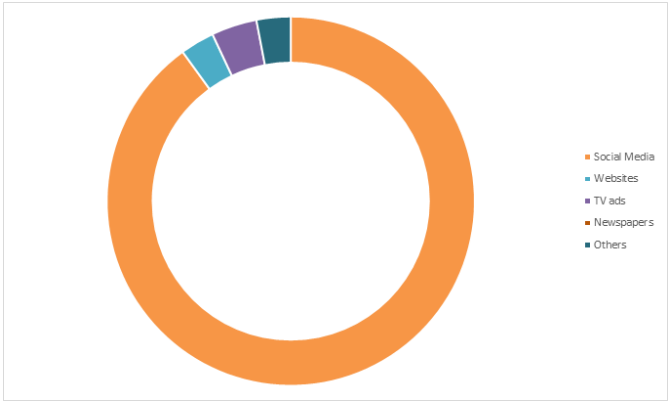
Above analysis clearly depict that the outbreak of the novel corona virus urged pupils to pursue online mode of education replacing from conventional brick and mortar. From the pie chart we analyse that 90% started using the online mode was due to the pandemic while a 10% was familiar with the online mode of education even before the outbreak of the virus.



Source: Secondary Data

This is a report from UNESCO, it shows the growth of the Online education's growth impact which is accelerated by COVID19. It shows that the sector has a rapid and uninterrupted growth which rose to 1.3 billion from 0.3 billion, by the end of March, 2020, which gain is assumed to have further increase.

Influencing factors that helped to come across the online education.



Source: Primary Data

Most of the respondents (90%), came to know about the online education from the social medias, while websites and others which include direct selling of their brand by the company showed a 3% each and the impact of TV ads were 4%. Newspaper did not make any impact. Here we see, the social medias as an effective tool to disseminate information. This might be because the youngsters spent more time on the social media sites.

Issues faced with the online educational platform.

There were several issues faced by the respondents in accessing the online education, even though it had many advantages these issues slightly contributed to create discomfort with the online mode of education.

Issues	Per cent
Connectivity	65%
Communication	29%
Expense	4%
Others (Health Problem)	2%

Source: Primary Data

In this survey, it was found that 65% pupil did suffer from connectivity issues and 29% had communication problem as they were reluctant to give responses to what the tutor says or there lacks a person in

recorded lectures which is not live. A 4% marked that the expenses of the online education are barely affordable and only 2% were concerned about the health problems.

Connectivity is a major problem. And the unstable speed of the internet is a hindrance in access these kinds of services. And expense is also a concern because in India pocket friendly data packages are less. And most importantly prolonged use and exposure to the computers, laptops and mobiles etc. can cause several health problems. Also, the long for personal real life experience cannot be obtained from any kind of such technology.

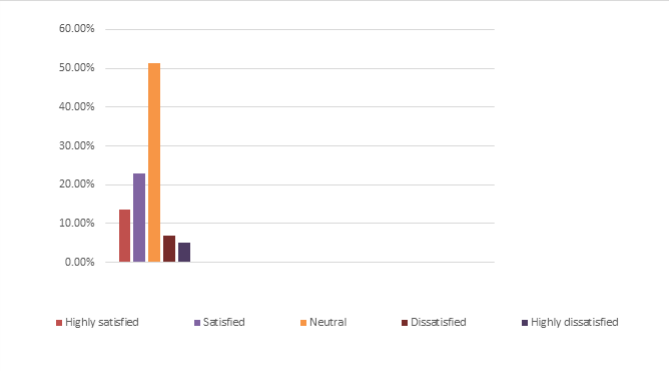
Even though it possess these issues, it has several advantages by which it become popular, such like;

- Eliminates time constraints
- Eliminates place restrictions
- World wide access
- Course choice increases
- Understanding the concepts with the technology
- Affordable
- Eliminates additional cost.

Effectiveness of Online education

Level	Data
Highly satisfied	13.6%
Satisfied	23%
Neutral	51.4%
Dissatisfied	7%
Highly dissatisfied	5%

Source: Primary Data



Source: Primary Data

From the above analysis we can deduce that majority, that is 51.4% of the learners did not have any improvement or satisfaction nor dissatisfaction with online education. While for 13.6% it was highly effective and 23% said that they were satisfied. But on the other hand 7% respondents said, online education did not make any improvement and for 5% it was highly disappointing.

So, for the action to be effective, it requires some amount of dedication and contempt. And here from the earlier data, we saw the students highly preferred offline classes and their lack of interest in online mode and the issues that is bundled with the online education might have contributed to the effectiveness of the online education.

Preference in type of online education.

Ranking (in Numbers)

	1	2	3	4	5	Total
Paid App	6	2	1	1	2	12
TV Channel	4	1	6	4	3	18
YouTube	12	4	8	7	5	36
Free App	5	2	10	3	3	23
Social Media	3	5	1	1	1	11
Total	30	14	26	16	14	100

Source: Primary Data

From the above data we see that YouTube is most preferred and the least preferred is Social media pages. The demand for paid apps is not considered as significant to the respondents. Moreover there is a wide usage of products like google meet, zoon etc. for live and interact classes

Online educational opportunities provided by the MHRD:

MHRD announced and launched various products for the e-learning, which are as under;

- The SWAYAM Moocs courses
- E-PG Pathshala

- DIKSHA
- CBSE Podcast
- National Digital Library of India
- IIT Pal
- Vidwan
- e-Shodh Sindhu
- E-Classes On Swayam Prabha DTH Channels
- UMANG mobile app

B. FINDINGS

The following are the findings of the study,

- Online classes are preferred by 40% of the students whereas 60% opt for offline mode of education
- 90% of the pupils started using online means as an effect of the pandemic while a 10% was aware and had been availing these services even before the pandemic.
- Online Education grew from 0.3 billion to 13 billion by the end of March, 2020 which is assumed to have further growth.
- 90% of the respondents came to know about the online educational means from the social media sites.
- Of the various issues faced with regard to the Online education, connectivity ranked 1 with 65% and 29% had communication problem, while 4% and 2% responded it was expensive and had implications on their health respectively.
- 51.4% said online education was neither disappointing nor made any improvement. 13.6% and 23% responded that they were highly satisfied and satisfied respectively, but on the other hand for 12% it did not meet any expectation.
- Most preferred mode was YouTube and the least preferred is Social media pages.

IV. CONCLUSION

With the outbreak of COVID19 the Online Educational Platform saw a new chapter in its existence. It gained fame as the restrictions and the COVID19 protocols made people stay in places where they were and somehow the student community and the learners had to continue with their academia, so that it won't affect their future.

From the analysis of the data so collected from the sample population, pupils tend to give importance to offline modes rather than online, it is because they give more values to human touch and personal real live experience, and these factors contribute to the degree of effectiveness in continuing with the online education.

The private players, the government and other allied stakeholders are trying their best in providing with the quality services to the academic world. And we see the free governmental channels and other initiatives, YouTube, Free access app, Premium application etc. are available to access to online education in an affordable manner. Byjus is an online educational giant in this field by providing with attracting and effective service. Also, other players exist. For the live classes apps like zoom and google meet are widely used by the institutions and social media like whatsup etc. contribute to the effectiveness of the classes.

To conclude, online educational mode has both advantages and disadvantages, but with the passage of time and as the need of the hour online educational mode is continue with progression in the academic world.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Technology Trends That Are and Will Be Driving the Banking Sector in Agile Times

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ABSTRACT

Unpredictable events of 2020 has brought about a humongous change in the Indian Banking Sector thereby making the banks to focus heavily on technological usage to improve managerial abilities, risk mitigation and monitoring. Banking Sector was already at the cusp of change due to grappling system based issues and growing NPA's (Non-Performing Assets) which further ruined the growth of banking with the looming economic slowdown and the COVID-19 pandemic.

Technological transformation is the key to support the banking in VUCA (Volatility, Uncertainty, Complexity and Ambiguity) times. This can be achieved by bringing in changes in the banking architecture, hybrid cloud computing without compromising the security of data, blockchain integration for protecting data distortion and veracity, artificial intelligence models for feedback and data retrievals, Chatbots and API Banking.

The paper being conceptual one intends to focus on the above specified concepts that will help the banks to survive in the VUCA times.

Keywords : Agile, Artificial Intelligence, API Banking, Blockchain Integration, Chatbots, Hybrid, Technology, VUCA

I. INTRODUCTION

Technology often helps an economy to open up itself to the world of advanced markets but also invites umpteen issues related thereto. Banks are no excuse in this case. Every bank aims to garner more market share through provision of satisfactory services to its customers through the use of technology. This has also led to an increase in market penetration, productivity and efficiency of banks (Jain & Popli). Banks are able to reduce its overall cost and have also made small value transactions feasible. Banks always has various IT enabled services in order to provide benefits to customers also the government has been aggressively promoting digital banking, this show how important technology has become for banking sector (Sharma & Mital). Aitegroup has conducted a case study under the leadership of Infosys, too has emphasised on usage blockchain technology along with its opportunities and challenges, open banking, API (Application Programming Interface) Banking, operational resilience etc. for the survival and success of banking in the VUCA times.

The study focuses more on the positive aspects of technology usage in banking as customers have been through various discomforts during the pandemic times therefore it is belief that application of new and innovative technologies will satisfy customers with regards to expected services and banks in reducing Non Performing Assets to a certain extent.

II. PURPOSE

The purpose of this study is to throw light on new technology trends in banking sector that will help banks to survive the agile times.

III. METHODOLOGY

The current study focuses on the new trends in technology that will play an important role in changing the face of banking sector forever. Hence the study is qualitative in nature. The information for the study is collected through various research papers, journals, magazines, blogs etc. hence it is secondary in nature.

IV. RESULTS AND DISCUSSIONS

CONCEPTS UNDER FOCUS

A. Chatbots –

Chatbots helps to deliver services to impatient customers as it is cost efficient and is supported by Artificial Intelligence. Chatbots are alternative to the traditional communication methods like e-mails, mobile, fax etc. It helps to promote conversational banking where personalised services can be delivered if advanced AI is used then bots can definitely offer better financial tips on the basis of customers banking journey, detection of fraudulent activities etc. Chatbots helps in automated conversation which otherwise would be requiring an employee to answer thus helping the organisation to reduce its monetary cost associated with employee engagement and training, provision of after hours of business support to customers by reducing the response timing etc.

B. Blockchain Integration –

Blockchain helps to track transactions in secured, verifiable and permanent way but can disrupt the state of banking play as it allows transactions that get cleared and settled as soon as payments are made and this goes against the banking norms as the current system clears and settles transactions only after days of payment. Though it was initially used for Bitcoins (crypto currencies), it is believed that blockchain are secured, transparent and cost effective thereby enabling banks to improve security, provides faster payments, reduced error handling, reduction in cost by removing third parties and gatekeepers from credit systems helping banks to give loans at reduced rates of interest and enhance customer satisfaction.

C. Hybrid Cloud Space usage –

This improves responsiveness in banking by addressing data security issues and increasing the capability of banks to organise huge funds instantly. In order to sustain the seamless demand of customers banks seek to develop better and safe apps for instant payments. Trusting the apps is a challenge for customers. Cloud technology helps banks to arrive at logical solutions by reducing dependence on on-premises data compute and storage options. This agile will help banks to come up with new improved and better products and services suitable to market requirements. In overall banks can sustain and be resilient at VUCA times.

D. Artificial Intelligence (AI) –

Higher focus on digitisation through the use of trustworthy AI will reduce the credit risk which is associated with fraudulent borrowers who gain under the ease of doing business criteria. As AI driven feedback system will be capable of not only recording feedback but also borrower's data enabling tighter scrutiny of KYC mandates. Applying AI to banking will help banks to progress and adopt Open Banking through sharing of data via APIs. This helps banking entities to compare the overview of financial position pre and post pandemic times, keeping easy track of money and automatic reconciliation of transactions (Edward Berks, 2020). Even the Indian Accounting Standards 32 and 109, Open Banking etc. will expand the reliance of banks on advanced financial models that are risk aversive and competitive (Jaya Vaidhyanathan, 2021). Banks are required to be proactive and anticipate future challenges that are eyeing the banking business. Therefore using Enterprise Risk Management software will help the banks to understand and know the nature and kind of risk, strategies to be applied to overcome them with accountability.

E. Application Programming Interface (API) Banking –

API enables banks and third party companies to provide augmented services to customers than they alone can provide. API helps to create interface between software of companies to connect to each other's tools, product and services. We have multiple APIs which we customers very often use like for e.g. Paytm, Phonepe, GPay etc. Through API has been used for decades but still has gradually become prevalent APIs also helps in promoting innovations thereby enabling the baking to streamline financial services like loan application, checking CIBIL scores before disbursal of loans, credit cards, payment gateways, tracking the entire journey of banks customers at one view etc. Numerous third parties can banking services and can also offer the same to their customers. It is also believed the APIs holds the ability to boost Open Banking.

V. INSINUATION OF STUDY

Technology always has its limitations hence banking blindly on technology driven software and products would not be a cake walk. A backup process is a must. Upcoming banking or merged banks can think for such technological applications as they are into transition phase. Banks must review the implementation of the above stated technologies to find out the deviations.

VI. CONCLUSION

On the basis of the above information garnered it can be stated that these technology based services surely can help banking sectors to grow but only time can say which technology will sustain and which won't. A strong, smart and intelligent technical platform can help banks to monitor customer data and track collection process in terms of real time further reducing NPAs and improving customer experience.

Per se dilemma persist as initial investments may prove costlier but with a gradual functionality things may fall in line helping the banks to become better service providers further increasing customers trust and satisfaction.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
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Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Agile Strategies to Bounce Back- A Case Study of Small Business

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ABSTRACT

In current dynamic business environment, technological advancements and complex organizational systems have given birth to Volatile, Uncertain, and Complex and Ambiguous (VUCA) world. The success strategy invariably relies on agile business models and systems enabling proactive adjustment to business environment through sustainable initiatives realigning business goals towards projected plans. The research is a systematic effort towards emphasizing agile management strategies for small businesses incorporating the spirit of entrepreneurship and socio-economic sustainability post pandemic economic downturn. The study presents the case of women self-help groups in Madhya Pradesh under National Rural Livelihood Mission (Aajivika) who were manufacturing school uniforms and swiftly shifted to masks and PPE kits during pandemic for a novel yet economic motive. Small Businesses having more flat organizational structure and quick communication network fostering faster decision making will have huge potential to bounce back quickly in times of stress relying on co-creation / collaboration, quality parameters using right set of innovative technology and constant focus on creating business value through continuous innovations and learning systems. Thus the study proposes a unique "READY" model based on agile strategic interventions for small businesses to outgrow the environmental challenges.

Keywords : Agile Management Strategy, Small Businesses, Technological innovations.

I. INTRODUCTION

Trade dynamism in current global age with fast changing technological inhibitions and complex environment have challenged the management worldwide for bringing effectiveness and efficiency. In current VUCA (Volatile, Uncertain, Complex and Ambiguous) times organisations are compelled to redesign and rethink the traditional organizational structures, systems and processes for getting things done amidst frequent interruptions and evolving priorities. An agile management strategy is identified as key to organizing effective teams working in collaborative set-up. It focuses on flexible and proactive teams to outperform on changing economic environment and priorities with constant focus on delivering business value and quality.

Agile business models integrate business development with agile principles of iterative and incremental value addition with two of the most common approaches – Kanban and Scrum. Kanban framework focuses on visualizing task on board for fixating and managing priorities while scrum is prescriptive and complex procedure that works with top management

to define specific roles, meetings and time boxed sprints. However both place high importance on continuous learning and improvement with more aligned and autonomous teams to manage interruptions effectively.

II. NEED FOR AGILE STRATEGIES

Agile strategies present great opportunity to leverage the existing pool of resources and knowledge bank in rapidly evolving environment witnessing constant technological disruptions. The former creative disruptions have not just accelerated digitization but also exceeded the voluminous exchange of information, learning management and transparency for distinctive value creation by acquiring and retaining best of resource pool. Small Businesses have an added advantage of applying agile strategies effectively in small portion of time relying on strongly motivated teams knitted with organizational vision and goals.

III. CHALLENGES AND LIMITATIONS

- Few of the most challenging aspects of implementing agile strategies are: translating organizational vision into tangible needs and requirements.
- Organizing different works and aspects according to dynamic preferences and priorities.
- Push innovative ideas into system, refining and continuously improving upon them according to environmental dynamics through multiple iterations.
- Inclusion of feedback loop in iteration process for better progress and tailored situation based programs.
- Creating learning organizations constantly innovating, crafting effective business solutions based on flexible teams, transparent communication and accountability for bringing relevant changes.
- Working on sprint development programs dividing work at tactical levels to achieve strategic goals.

IV. RESEARCH OBJECTIVE

The current research study presents the case of effective implementation of agile strategies and business remodelling in micro and small business. It adds to existing poll of knowledge resource emphasizing the agile business delivery models to outcast the business implications of evolving environment and business disruptions. Thereby it makes an effort to stress on new managerial models refining business growth in turbulent times.

V. RESEARCH METHODOLOGY

The researcher gathers primary data by way of personal interview with project coordinator and team of assistants initiated the agile models in the project illustrated in the research paper. It further relies on search and integration of both primary and secondary information available in various published sources like Harvard business review, Mckinsey reports, journals available both online and offline to draw relevant interpretations for presenting a unique model for implementation of agile business model and strategies in small non tech businesses.

VI. REVIEW OF LITERATURE

In words of Vandersluis, C. (2014). The popularity of Agile project techniques is growing rapidly in IT projects due to its faster completion and success rate in delivering project objectives. Application of this not restricted to software or tech projects but is gaining importance gradually in non tech small businesses too. As they are based on developing

iterative process rather than pre-set plans looking at evolving business needs.

Nantawut Sriariyawat (2018). brings forth Rapid application design (RAD), the historical philosophy of agile project management in 1980s and 90s which is accepted as a precursor to agile. It focused on developing designed thinking and collaborative approach of participants across domains to develop software in co-existence. The researcher further explores the readiness to adopt agile strategies by SMEs in Thailand through documentary research and surveys based on semi-structured interviews or questionnaire. It identifies agility drivers, providers and implementing strategies for value improvement. The findings justify presence of education, innovation and clear communication amongst personnel as founding principles of agile strategies overshadowing technical and financial resources.

Scrum framework being one of the widely used agile project management strategies exemplifies self organizing project teams built during instability engage in "learn by doing" (Lauren, 2018, p. 30) across multiple levels, dimensions and functions platforms for organizational knowledge transfer and learning initiatives. (Lei et al., 2017) The teams relies on sprint development plans working on collective intelligence, motivation and conflict resolution for accomplishing incremental objectives (Rigby et al., 2016) in various non tech projects.

Parizotto, L. A., Tonso, A., & Carvalho, M. M. (2020).explores implementation of agile strategies in SMEs in a bibliometric analysis of 235 papers and using minitab, excel and so on to support the findings. It highlighted project management practices, planning & control, collaborations and knowledge management. It stress on people and flexibility for creating a huge turnover. It results in people and innovation lead growth (Turner et al.(2010) for improving financial performance of SMEs (Pollack & Adler.(2016). It also caters to establishing relationship with policy partners to cut the bureaucratic limitations apart from tailoring the principles as per institutional culture, breeding research and efficient coordination with resource and time constraints. (Spinuzzi, 2015, p. 58).

Žužek T, Gosar Ž, Kušar J, Berlec T.(2020). Confirms considerable potential of application of agile strategies in SMEs by empirical data collected of twelve case studies focusing on values, philosophy, practices and beliefs to achieve new management paradigms in construction firms for enhanced performance and efficiency. It outlines the challenges faced while implementing design thinking, lean start-up model and agile business models to understand and eliminate employee and organizational pain points with better training, engagement and feedback mechanism.(Tze Chin Tang).

The Case of National Rural Livelihoods Mission (Aajivika) Self Help Group

National Rural Livelihood Mission(NRLM) works for capacity building of marginalized empowering them with skill training promoting employment opportunities and entrepreneurship for livelihood in rural-semi rural areas. The state of Madhya Pradesh incorporating the objectives of NRLM created collective platforms in form of self help groups for addressing socio-economic problems of rural poor in various areas. 'Man Reva Ajivika Vastra Nirman Mahila Sahkari Samiti Limited,' under MPSRLM, Mandla district of Madhya Pradesh is one such registered social enterprise incorporated in 2013 that envisages building self reliant economy with rural women empowerment creating entrepreneurship opportunities. It trained very low or illiterate tribal girls of extremely backward areas stitching giving them initial materials and other supplies along with assured business of Rs 1600 crore making school uniforms for rural middle and high school girls and backward caste boys. It started with two independent manufacturing unit with 15 machines each in

Tikariya and Rambag Village with financial support of Rs 3 lakhs from Central Bank of India and marketing assistance for creating a brand label 'Aajivika'.

Catering to needs of school students and government soon preceded the market requirements with technical support of MAP_IT and GoMP created Swa-sahayta portal for facilitating information of schools and students to register and take orders of uniforms. These units have worked on creating efficiency in value chains by procuring raw materials from open market and aggregating the stitched uniforms at cluster/ block level for distribution to all government run schools. Looking at the seasonal nature of business they diversified in other open market works for local clients or traders manufacturing salwar suits, shirts, pants, bags and other apparels apart from re-packaging sanitary napkins in large scale at their community level. This was instrumental for community development and employment apart from saving the treasury of state government which instead of disbursing subsidy to parents which was used either on alcohol or household expenditure went to enterprises account.

In uncertain times of pandemic Covid 19 when schools were closed from March 2020 which marks the peak season with the beginning of new session they faced a financial crunch due to surge in demand. The dismal situation of employees challenged the institutional novelty which quickly started manufacturing PPE kits and face masks supplying to health workers around the state and elsewhere. However the sustainability and profitability of business organizations largely depends on agile management strategies for overcoming operational and environmental challenges.

VII. AGILE BUSINESS PROCESSES APPLICATIONS

- **Sprint & Sprint Review meetings –** Business organizations working with agile strategies align their managerial and marketing goals conducting periodic or daily scrum meetings to keep project teams on track ensuring no hindrances along the way. Sprint review forms the feedback loop to measure the progress, interdependency of various functions and so on giving great insights on most effective and optimal retrospective opinion poll. It also facilitating harmonious functioning of cross departmental teams.
- **Minute and frequent changes-** looking at the market trends, expectations and environmental changes these business organizations are quick to respond.
- **Iterative process-** small businesses realizing the business potential of worthy capital investments should focus on optimizing and reinventing the same to scale them incrementally.
- **Burndown chart-** mapping the resources and achievement contribution of various departments towards project and organizational goals and objectives valuating the more useful metrics as compared to less useful focusing all efforts and resources towards achievement of vision and objectives.

Agile business processes embrace the changes with incremental strategic initiatives at various organizational levels. People, communication and process create an ecosystem. They partner for knowledge transfer and sharing. It answers what, why, when, where, who and how the outcome is delivered incorporating technological ad other inputs. . However it relies on continuous appraisal working on quantitative and qualitative metrics, customer feedbacks on novel experiments in market to minimize wastage.

VIII. FINDINGS:

Agile strategies and process brings a 360 degrees change in the organization by continuously directing

the team efforts towards realizing their full potential through constantly motivating, engaging and inspiring. The case above epitomizes the same business dynamics and uncertain external environment which necessitated the teams to rapidly adopt the products and technology through frequent feedbacks of customer preferences, market trends and employees as one of the important stakeholders. Close collaborative ties amongst the cross functional team for bringing creative breakthroughs and incremental market development. This is evident with the tailor-made training workshops for the women employees (part of self help group) on continuous basis who started with uniforms shifted to other apparels and then PPE kits looking forth to market developments. Organizations following agile management policies are quick to respond to technological advancements as a commitment to process oriented culture for optimizing the resource utilization through rapid iterative systems to minimize the waste.

The changes must begin at a small level unlike the popular belief that large organizations bring out the changes, dispersing from one department to other by way of mentoring or peer tutoring. It began with lead taken by MAP-IT and GoMP for evolution of SWA-SHAYATA portal to take orders from geographically divided areas digitally spreading into new markets.

Agile management believes in bringing all cross functional teams in line with the organizational goals, beliefs and value system often changing roles rather than organizational systems. The leadership inspires for innovative initiatives through mentoring or counselling giving them full autonomy to upscale. The principle encapsulate thoughts of General George S. Patton Jr. "Tell them *what* to do, and they will surprise you with their ingenuity." The social enterprise MPSRLM empowered the group with skills, technology (machines) and materials as handholding support to community development however giving them freehand to go beyond the core area of work platform from uniforms to else. Thus it has focused on collective development of teams shifting focus from individual performance to business outcomes and performance metrics breaking the silos.

The research proposes a suggestive model for small commercially and socially entrusted organizations working on the acronym READY which stands for

R-Robust & Resourceful, teams within organizations pooling energies for robust agile processes and systems,

E- Empowered, empowered stakeholders and cross functional collaborative network of teams looking for optimizing resource solutions to complex and uncertain situations

A-Adaptable or accommodating, accommodating the relevant emerging changes within the environment responding proactively to organizational requirements and customer satisfaction.

D-Dynamic, adding the global dynamism of VUCA business operations at strategic, functional and tactical levels whether in large or small organizations to upscale business operations.

Y-Youthful, larger risk appetite and innovative breakthrough solutions to challenging complex environment for breaking the silos.

IX. CONCLUSION

Modern business organizations embracing agile management solutions, processes and strategies have taken few strategic initiatives comprising active communications, capacity building of teams, decisive aptitude and participation of stakeholders catering to requirements at organizational, process and solution level.

Agile business processes demands quick changes in people's behaviour and process operations as the critical workflow demands. To its criticism mostly ignoring the people who are expected to quickly learn and relearn in limited resources. Many of these are not evident for small and medium enterprises, which

due to its resource constraint requires a larger transition time, or comprise unnecessary cost, time and effort. It mostly suits projects which are complex and uncertain with cross functional collaborating teams. While it's not suitable for small or strictly regulated units under law like accountancy firms.

Agile management systems are one of the most effective solution that work on reassembling teams and their portfolios through supportive behavioural changes and adaptation to prominent risk prone situations within ambit of organizational objectives whether in large or small organizations. It integrates standard processes and documentation with modern business operations and strategies at small grassroots level in small incremental steps to bring innovative business focused teams committed to break silos.

Anuj Pruthi, Business-Focused Teams Successfully Eliminate Silos ***A Dojo in action (Source)*** **May 2016 issue (pp.40–48, 50) of Harvard Business Review.**

Rigby (2020) Doing Agile Right: Transformation without Chaos (Harvard Business Review Press, 2020).

"Technology is seamlessly integrated and core to every aspect of the organization as a means to unlock value and enable quick reactions to business and stakeholder needs."

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

A Study on Youth Behaviour to Adopt The Green Fast Moving Consumer Goods (FMCG) in Jammu and Kashmir with Special Reference to District Anantnag

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ABSTRACT

Green development is a necessary step to protect the environment from the harmful effect of pollution. This research paper aims to know about present youth behaviour towards green marketing policy in Fast Moving Consumer Goods (FMGS). Increase in pollution, emission of greenhouse gases, climate change and global warming are major environmental challenges for future generation to acquire sustainable development. Green FMCG products are widely used at global scale to combat anthropogenic impacts on environmental degradation. To solve the environmental problems, most of the goods manufacturing companies and governments are taking various measures to promote green marketing in the FMCG sector and other sectors. In the modern age, almost everybody is aware of green marketing and its role towards protecting the environment. In This study, we took two independent variables, i.e. respondent's health consciousness and environmental issues, whereas the dependent variable intends to purchase the green FMCG. This study is based on both the primary and secondary data and the statistics evaluation percentage approach is used. The study indicates that modern young generation is aware of the green products and is very interested in adopting them. The finding suggests that youth are worried about the individual health as well as environmental problems. We suggest that the youth of Anantnag district are self-motivated towards individual health aspects as well as the environmental aspects, but organising effective and extensive awareness programmes about the Green FMCG is the need of the hour.

Keywords: Green FMCG, consumer goods, health consciousness, environmental problems, green marketing.

I. INTRODUCTION

The green products or green FMCG are the requirements of the present condition of the environment, where pollution increases day by day, affecting sustainable development. Green development is a necessary step to protect the environment from the harmful effect of pollution. As

we move very fast towards economic development, we pay the price in environmental pollution, such as transportation and plastics. One of the significant forms of environmental pollution is climate change, and the primary cause of this is the greenhouse effect. In the greenhouse effect, carbon emissions increase in the environment, causing higher temperature, melting glaciers, increase in Chloroform gas, destruction of animal habitat, and extreme weather conditions. Many countries have taken various steps to solve this mentioned problem, and introducing green products is one of the many steps to solve the environmental problem.

This research paper is based on the youth's perception of green products usage, consciousness towards their health and social problem awareness. In this research paper, we consider the youth of age group 17-25.

A. Green Products

Green products stand for those products that have no effect on the environment after their usage and do not harm human beings than traditional products. These products can easily be recycled; these are energy conservative and reduce carbon emission. These products are environmentally safe as it helps to reduce the air, water, and land pollution. Green products are made from nontoxic products, or we can say these products are made by natural ingredients that can quickly decompose.

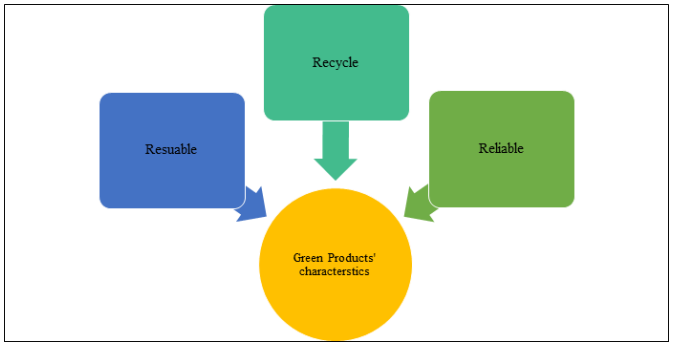

Figure 1: Nature of Green Product

FMCG stands for fast-moving consumer goods consumed daily or using these products daily, such as cleanser, cosmetic, personal care, oral care, packaged food products, bulbs, batteries, paper products, glassware, and biodegradable plastic products.

B. Review of Literature

Ghosh (2010), his research about green-marketing, it is a dynamic concept in present era, he tried to introduce the new terminologies and significance of green marketing, analyzed certain reasons that companies must go for green marketing. Population explosion, inflation, political pressures to handle environmental problems lead to healthier innovation.

Subhasree et al. (2013) in their research paper Consumer Sensitivity towards Green Marketing in India, investigated how sensitive Indian consumers are to Green Marketing. India is the second-largest country in terms of consumers. It has witnessed a new segment of environmentally conscious customers who want to go for green products instead of traditional products. We all desire a quality of life full of health and vigour, and it can be possible while being sensitive to the environment. In consumerism, the consumers and the corporate's environmental awareness plays a vital role in sustaining our natural environment.

Karpagavalli G (2015) explains the concepts of green marketing in a global context and the Indian context. Mainly the paper highlights the opportunities and challenges of green marketing and at the same time discuss 4 P's of green marketing and explains why green marketing is essential in the modern world. It is said it helps full for the country's overall development; customers demand the environmental aspects fulfilled in green marketing practice.

Nagaraju et al. (2014) find out about Consumers' Perception Analysis-Market Awareness Toward Eco-Friendly FMCG Products-A Case Study of Mysore District. It used to be established nearly 93.3 % of the respondents are having an awareness of the eco-friendly FMCG products. Eco-label is regarded as a crucial tool in identifying eco-friendly FMCG products. The eco-friendly FMCG product's charge is higher than non-eco-friendly FMCG products, and

only 63.3% are willing to pay more for the product. The study indicated that the Mysore district of Karnataka is aware of the eco-friendly FMCG market and has more issue for eco-friendly products. To motivate a greener environment, the government, organizations, and customers will have to put their arms together in growing consciousness amongst customers for environment-friendly products.

C. Research Gap

Various researches examine consumers' behaviour like the product, consciousness, brand loyalty, and consumer lifestyle. In this, we study the green fast-moving consumer goods in the view of health consciousness, environment, social issues, and intentions to purchase. We relate intention of purchase concerning health conciseness and social issues. This research study is based on the green product, and we feel that green product is gaining popularity among the people. Consumers are more health-conscious and concerned about the environment and society. After studying many pieces of literature, we concluded that not so much study is done on the above particular variables.

This study is significant for the issues regarding environmental issues and how youth is using green products to being health conscious. The Green FMCG will provide better options to solve environmental issues regarding consumer purchasing behaviour.

II. METHODS AND MATERIAL

A. Objectives

a. To consider the relationship between health awareness and youth's intention to buy the green FMCG.
b. To perceive the relationship between social problems and youth wished to buy green products.

B. Research Methodology

Nature of study

This study is descriptive research, which describes characteristics and data of the population being studied.

Questionnaire design

A close-ended questionnaire is drafted to collect data, which costs 10 questions separated into three sections.

Population structure

The population structure consists of youth aged 17 to 25 years of Anantnag district of Jammu and Kashmir.

Sample

The total sample consists of a total of 100 youth respondents by using convenience sampling.

Data collection

The present study is based on both primary as well as secondary data. Primary data has been collected in the form of questionnaire framed and personnel interview methods. Secondary data has been collected from various websites, published articles, research reports, relevant journals, magazines, newspapers.

Data analysis and interpretation

In this study, we use a simple statistical tool, .i.e. percentage method, for data analysis. Data analysis is based on a questionnaire related to health consciousness and awareness about social issues among the youth population of Anantnag District.

Table 1: Questionnaire adopted to accomplish the study and the respective responses.

Q. No.	Question	Response (%)	
		Yes	No
1	Are you conscious about health?	73	27
2	Do you know about your health changes, such as weight gain and any silent diseases?	68	32
3	Do you agree with the fact that by using Green FMCG, you will be healthier?	88	12
4	Do you believe that Green FMCG has some negative impact on your health while using it?	39	61
5	Do you believe that by adopting green FMCG products, you contribute to make your environment clean?	86	14
6	Do you feel that to protect your environment from pollution is your social responsibility?	91	09
7	Do you agree that the use of Non-biodegradable plastics causes environmental pollution?	96	04
8	Do you aware of global warming and its effect on the environment?	84	16
9	Do you agree that using Green products reduces global warming?	73	27
10	Do you believe that there is less awareness of the usage of Green consumable products in our country?	55	45

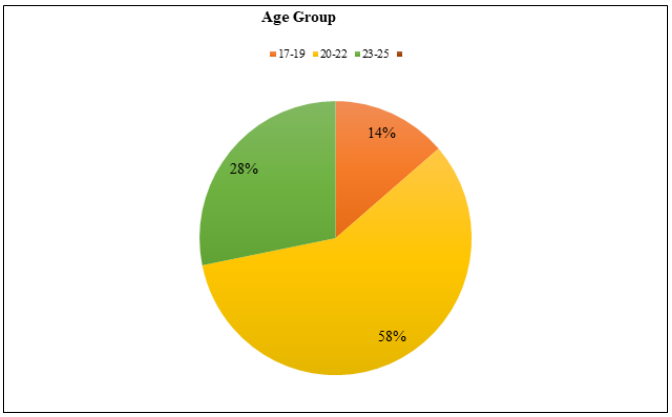

Figure 2: Pie chart showing three age groups of respondents.

III. RESULTS AND DISCUSSION

From the field survey it was observed that most of the respondents (58%) fall in the 20-22 year age group (Figure 1). Only 28% of respondents belongs to the age group of 23-35 and 14% of respondents fall between the age group of 17-19.

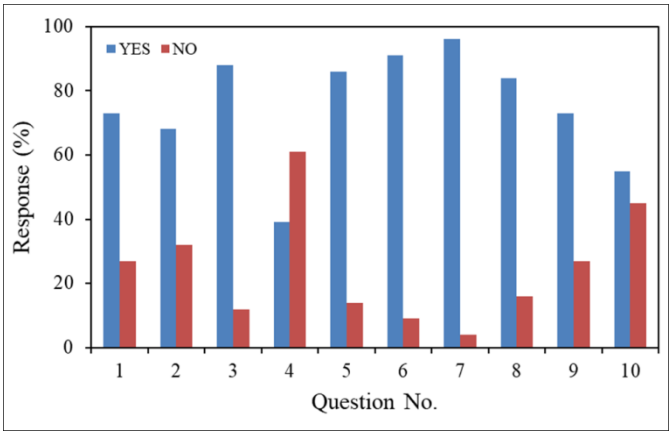

Figure 3: Graphical presentation of Questionnaire and response.

From table 1, it is observed that most of the respondents are well motivated towards the Green FMCG approach. It is evident from figure 3 that 90% of the questions have the positive responses greater than 70% with exception of Q.No. 4. The low positive response for the Q. No. 4 might be due the unawareness among the youth about the benefits of Green FMCG and its novelty in the area. Lower positive response for Q.No. 10 confirms and supports

the response of the Q.No. 4. This suggests that there is unawareness about the usage of Green FMCG not only in the district Anantnag, but also at national level; which needs to be taken into consideration at first priority. In the present study, it was observed that the youth of Anantnag district are well aware about the impact of non-biodegradable stuffs on the natural environment as depicted from Q.No. 7. This indicates that the youth of the study area are not only hygienic and conscious about their own health as indicated from the response of Q.No. 1 & 3 (figure 3), but also about the health and condition of the surrounding environment. The present study is suggesting that the youth of Anantnag district are self-motivated regarding the individual health aspects as well as the environmental aspects, but organising effective and extensive awareness programmes about the Green FMCG is the need of the hour.

IV. CONCLUSION

The results showed that adolescents of Anantnag district of Jammu and Kashmir are health conscious, and it is a crucial motive in shaping attitude towards green FMCG. An adolescent consumer is well aware of their health, purchase mostly healthy foods from the market, read all contents on products and checks the expiry date of the product.

The young consumers buy green products to satisfy their daily needs. Youth consumers think that green products a rich source of nutrients and less harmful, which is good for health. Green FMCG had made more care about their consumer's health. So it has resulted that health consciousness is the more decisive factor for purchasing Green FMCG.

According to the result, youth has social attitudes towards Green FMCG. Youth want to be their cities clean, and they would be part of clean India; they will promote green living in our country, and the most important thing is that youth make every possible effort to reduce the use of plastic stuffs. Thus, social issues also take part in creating attitudes towards intention to purchase Green FMCG. Finally, health consciousness and socio-environmental issues are related to the intention to purchase Green FMCG.

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Perception towards Welfare Measures of the Labourers in Un-Organised Sector (UOS)

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ABSTRACT

Labourers in the organised sectors: railways, manufacturing industries, ports etc., are safe with welfare measures, on the background of their perception and bargaining power. But the poor perception and poor bargaining power of the labourers in unorganised sector lead to non-availability of the welfare measures admissible for them. The present study measures knowledge, understanding and attitude of the labourers in the unorganised sectors, towards welfare measures, like: educational benefit, recreational facilities, food and conveyance. A sample of 64 labourers from Kerala, Karnataka, Andhra, Maharashtra, Delhi and Assam has been taken into consideration. They are Head load workers, Masons, Carpenters, Tillers of the soil, Domestic servants and Painters. Data collected on-line through the co-investigators prove the hypothesis, that the labourers in the unorganised sectors have insufficient knowledge, understanding and attitude of welfare measures, is true. Actions are invited for governmental interventions in this regard.

I. INTRODUCTION

The psychological term 'perception' means, anything one experiences or understands through the sensory functions: seeing, hearing, feeling, smelling or tasting. But perception is more than this sensory derivations. Perception is the mental activity of knowing, interpreting and taking decision over something. When human mind perceives anything, interest, attitude, and acceptance etc. also come in.

For example, to an ordinary citizen, who has concern about reasonable use of natural resources, the question, "what is your perception about rain water harvesting?" is not at all a foolish question.

What is the meaning of the term 'perception' in the above question? By 'perception' the questioner means, how far one knows about rain water harvesting technologies and what is his/her opinion about accepting and disseminating that concept. It is a matter of one's leaning towards rain water harvesting and positive thinking to recharge earth with water for future days.

If the meaning of the term 'perception' is clear now, look into the title of the article. It is about the perception of the labourers in un-organised sector in the country towards welfare measures. The labourers in railways, manufacturing industries, ports etc. are organised through trade unions and associations. They are organised in the sense that they have the sense of unity, bargaining power and above all they have a net-work of control over themselves. Their actions of protest and negotiations are like weapons to

achieve what they demand from the employer. Thanks to the collaborative efforts and collective bargaining, the labourers in the organised sector are in a state of enjoying welfare measures in the forms of free conveyance to work-place, food at subsidised rate, recreational facilities and leave travel concession. Moreover, they have considerable knowledge about the welfare measures yet to be achieved from the corporate-employer or government-employer.

On the other hand, what is the knowledge of the labourers in the unorganised sector about welfare measures? Head load workers, masons, carpenters, tillers of the soil, domestic servants, and painters, who earn daily-wage are poor with their bargaining voice and weak trade-unionism. As a consequence, they have less awareness, understanding, interpretation and interest towards achieving welfare measures as gained by the labourers in the organised sector. As the daily-wage earners their work-places are changed almost all days in a week, as well as the employment-donor. There is nobody to educate them about the welfare measures to be realised from the individual-employers. It is against this background the present enquiry has been planned to analyse the consciousness of the labourers of the unorganised sector in India, through a systematised approach, thus the investigation has only one objective:

II. OBJECTIVE OF INVESTIGATION

To measure the level of knowledge, understanding and attitude of the labourers in the unorganised sector.

As a part of this investigation, a review of the previous studies in this line of thought, has been done and the summaries have been presented with a conclusion.

III. REVIEW OF PREVIOUS STUDIES

P. Sathya (2016), in his study "Issues of Unorganized labourers in India " made an effort to bring out the problems of unorganized sectors, study of welfare provisions relating to unorganized sector and some solutions for their problems. This study is based on secondary data. The findings of the study were that growth of informal structure was more than the formal structure and at the same time unorganized sectors did not have steady employment, security, sustainable income etc. The researcher suggested that both Central and state governments should implement more schemes for supporting unorganized sectors to meet their requirements and needs.

Ipseetha Satpathy and B. Chandra Mohan Patnaik (2017), aim at understanding the dynamics related to unorganized sector workers. It is based on the objective to know various issues related to organized and unorganized sectors. The major findings of the study was that there existed poverty, lack of technologies, lack of social security, poor health condition, harassment at workplace etc. in the unorganized sectors.

Himangini Sharma (2017), researcher analyzed the problems of unorganized labourers. It is a review based study with the objectives, like: identifying the problems of unorganized labourers, studying the existing legislations and regulatory framework for the unorganized sector. It is purely a study based on secondary data. The researcher concludes that even though there exists legislation in India to protect the unorganized sectors, they are undergoing some difficulties, like: lack of security, low wage, exploitation and over-burden of work.

Subhasish Chatterjee's (2016) study "labourers of unorganised sectors and their problems" focuses on various problems of unorganised workers and the availability of social security systems. The study reveals that even though there are many social security schemes for the unorganised sectors, only organized labourers are enjoying the benefit. Government has failed to apply those schemes at

times of their requirements. Main recommendations of the study are: schemes for protection of workers, detailed time-to-time survey, expanding education etc.

P. Govindaraj et.al (2019), in their article describes about the role of unorganised sectors in India . The study concluded that if the unorganised sector regulated to the formal structure, the share of unorganised sectors in the Indian economy would eventually be reduced. Even though the government is on the right way by increasing the fund for the development of unorganised sectors still need to do more in order to reduce child labourer, low wages, health issues etc. to improve safety and welfare of the labourers.

The above researchers are unanimous in their recommendations in pointing out the responsibility of the state and central governments in implementing labour welfare measures in the unorganised sectors. Above all, the researchers have identified the importance of the presence of the labourers from the unorganised sectors in the economy. So that, they invite the attention of the society in the protection of the interest of the labourers towards welfare measures.

IV. METHODOLOGY AND THE PLAN FOR INVESTIGATION

This is a status study in which the data representing: current knowledge, understanding and attitude of the labourers towards welfare measures are collected, classified and statistically treated for analysis. A questionnaire with ten items had been constructed for surveying 64 labourers related to the un-organised sector in different states of India. The following table shows the blue-print of distribution of the subject of the study and the category of them from different areas.

Table1. Distribution of the subject of the study N= 64

Sl No.	Category	States						Total
		Kerala	Karnataka	Andhra	Maharashtra	Delhi	Assam	
1.	Head-load workers	1	1	2	1	2	2	09
2.	Masons	3	2	3	3	2	2	15
3.	Carpenters	2	3	3	2	2	2	14
4.	Tillers of the soil	1	2	2	2	2	3	12
5.	Domestic servants	2	2	2	2	2	2	12
6.	Painters	3	2	3	2	1	1	12
	Total	12	12	15	12	11	12	64

These categories have been taken on the belief that they are representatives of several categories who have lesser bargaining power, job security and trade unionism. There are several other categories, like: helpers in the construction sites, log splitters, wood cutters, house-keeping workers, cooks, fishermen, vendors, care givers to animals, who are also labourers in unorganised sector and have lesser voice in the society for increasing their wage and benefits. They are not included in the present sample study, where the focus was on the six categories defined in the above table.

The same scheme for distribution has been depicted in the following pie-diagram for a quick comprehension.

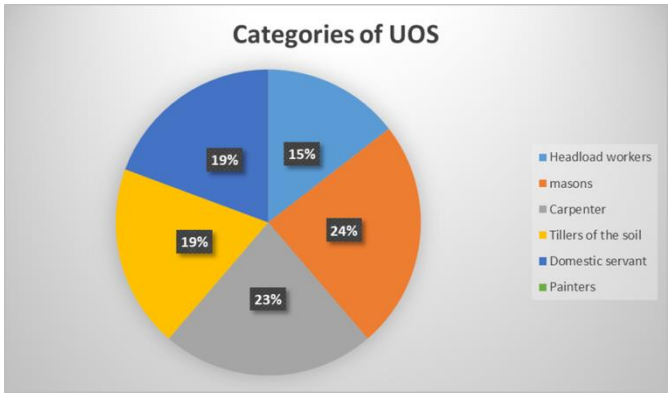

Figure1. Pie-diagram showing the share of categories towards the sample

Questionnaire, the only instrument for the present investigation had been developed with all the procedures of visualising, drafting, testing in small scale, refining and editing. The instrument had two sections. The first section was for preliminary details about the respondent and the second, was the set of items for responses.

The instrument in its full form has been shown as Appendix 1. But the items of the questionnaire relevant for the study have been shown here:

Table2. Items of the questionnaire

1. Do you get any additional benefit other than the wage from your employer/s?
2. Can you say certain welfare measures provided to the labourers in companies or factories?
3. "Only the labourers in companies or factories are eligible for welfare measures." Do you agree with the statement?
4. Do you enjoy any of the following welfare measures?
5. Have you demanded any welfare measure from your employment-donor at any time?
6. According to you whose responsibility is that to provide welfare measures to the labourers who belong to the unorganized sectors like yours?
7. Do you think that the welfare measures to labourers will cause increase in wage rate, which may result in unemployment for labourers?
8. 'Labourers in unorganised sectors are neglected of welfare measures due to poor bargaining power. 'How far do you agree with the statement?
9. If welfare measures are provided, how far the satisfaction of the labourers be increased?
10. "Welfare measures lead to increase standard of living of the labourers" Do you agree with the statement?

V. DATA COLLECTION

There were clear purposes in asking the above questions as such. The purpose was to measure the three components (knowledge, understanding and attitude) of the concept 'perception'. If a person has these three components about something with the cognition, she/he has the perception about that concept. Though these three (knowledge, understanding and attitude) seems same in their meaning, technically they are different to one another. Knowledge means the peripheral awareness about something. But, understanding is next higher in the hierarchy of knowledge, which denotes cause and effect of an event or a concept. Attitude is formed as a favourable thinking only after knowing and understanding something. So in the hierarchy of the three, attitude is higher than knowledge and understanding.

In the series of items in the questionnaire; 1, 2 and 4 are related to knowledge. Items 3, 6, 8 and 10 are associated with understanding. Items 5, 7 and 9 are for measuring attitude. All the ten items are jumbled in the instrument with a view to neutralise respondent's pre-occupation if any, with any item. All the options to the questions were presumed by the researcher to be the spontaneous answers.

All the items are close-ended, which were constructed with a view to measure the level of knowledge, understanding and attitude of the

respondents. This close-ended nature is helpful to manage the data collected through the tool. As the all ten items were of enquiry type, the responses could be measured assigning values appropriate. These values are put for calculation and comparison with other relevant values.

Questionnaire, the tool was administered to the subject through co-investigators, one each living in Kochi, Mangalore, Hyderabad, Mumbai, Delhi and Guwahati. These co-investigators were trained for data collection, who could translate each item to the labourers in their regional language. The filled in forms were sent back to the researcher promptly by the co-investigators for compilation, classification and statistical treatment. On-line facilities were useful in the collection process of data, in the month of September 2020.

VI. ANALYSIS

Data representing the responses to the questions are analysed in three sections:

- Section 1. Analysis of data related to knowledge of welfare measures
- Section 2. Analysis of data related to understanding of welfare measures
- Section 3. Analysis of data related to attitude of welfare measures

- **ANALYSIS: SETION 1**

Section 1 is explained in detail for reaching the findings based on those responses. Look at table 2, which shows the data related to knowledge. Altogether three questions were there in this cluster, vide, questions 1, 2 and 4 in the tool. For the first question 17% of the respondents say that they get benefit, other than their daily wage. But the remaining 83% do not get anything than their wage. The second question was directly a fact finding question, for which 41% of the labourers in the unorganised sectors said one or two names of welfare measures availed by their counterparts in factories and companies. The next question, i.e. the fourth in the tool was also a direct question, for which they answered that 39% got food as a labour welfare measure. Another 15% got nominal amount towards bus fare or autorikshaw charge. The remaining 46% do not get any benefit from the employer/s, under the label 'labour welfare measures'.

Analysis throws light on the fact that only the minority of the category has the knowledge of welfare measures, due to that reality that they are living in comparatively industrially developed areas. Authorities are also not taking much initiative for sanctioning orders for welfare measures for unorganised sectors in rural areas.

Table 3 Score of first cluster of questions (N 64)

Q 1.		Q 2.				Q 4.				
Do you get any additional benefit other than the wage from your Employer/s?		Can you say certain welfare measures provided to the labourers in companies or factories?				Do you enjoy any of the following welfare measures?				
Yes	No	1-2	3-4	5-6	Educational benefit	Recreational facilities	Food	conveyance	Medical Assistance for family	Any other
11	55	41	13	10	---	----	25	10	-----	----

- **ANALYSIS : SECTION 2**

The analysis part, that is, section 2 aims to examine the level of understanding about the welfare measures

among the labourers in UOS in the country. Questions3, 6,8and10in the tool helps to collect data concerned. The table shows that 78% believe that only labours in the factories are eligible for welfare measures and the rest of the respondents were against this opinion. Sixth question was asked to know, who was responsible for providing welfare measures. To this question 47% say, it is the combined responsibility of the employer/s and government, 25% have the opinion that local government is responsible and others opined, employer is the responsible person. The next question i.e. the eighth one, high lights the importance of bargaining power. The analysis reveals that 47% agree that they are neglected of welfare measures due to poor bargaining power, 31 % disagree with this, still there is a few who haven't any understanding about this factor. The tenth question is a direct one regarding the relation between welfare measures and standard of living of labourers. Out of the 64 respondents, 30 numbers strongly disagree, 20 disagree and14 respondents have no decision about the statement.

When one goes through the analysis, it is clear that the understanding level about the welfare measures are poor. Majority think all these facilities are only for factory workers. This may be due the lack of elementary education among the respondents. Due to poor social education they are ignorant of the rights of the labourers for better wages and labour welfare measures.

Table 4 Score of third cluster of questions (N 64)

Q 3.		Q 6					Q 8.					Q10.				
Only the Labourers In the Factories are eligible for welfare measures		According To you whose Responsibility Is that To provide Welfare Measures Belonging to The unorganised Sectors Like yours					Labourers in Unorganised sectors Are neglected Of welfare Measures Due to poor Bargaining power					Welfare measures leads to increase in standard of living of the labourers				
Yes	No	a	B	c	D	E	Strongly Dis agree	Dis agree	Un decide d	agre e	Stron gly agree	a	B	c	D	e
50	14	9	30	5	16	4	6	6	2	10	40	30	20	14	-	-

- **ANALYSIS : SECTION 3**

This is the most important area of the analysis. Through question number 5 in the tool, the researcher attempted to know the attitude of labourers on the necessity of welfare measures in their life. It reveals that majority (83%) has never demanded for welfare measures and only a few (17%) are aware about the welfare measures, and have demanded for that from their employers. The responses to the seventh question shoes that most of the labourers of UoS are fearful about losing their employment opportunity due to demanding welfare measures. The table shows that 64% have the opinion of demanding welfare measures may result in unemployment. But 16% is against this opinion and 20% are undecided. The next question i.e, 9th one in the tool is a direct question to know the satisfaction level of workers. With regard to that, 41% of respondents opined that welfare measures considerably increased their satisfaction level, 34% have reported extreme level of satisfaction and 25%

said welfare measures never increased satisfaction level of labourers.

The reason for the above dull responses is their lack of poor attitude or poor leaning on welfare measures. Most of the workers are not bothered about the increase in their living standard, for which increased wage and labour welfare measures have roles to play. In a few states workers, especially in the rural areas are treated as slaves and they are afraid of demanding additional welfare measures. They believe that the poor wages that they get, in cash or kind is great. If so how can they demand more benefits in the form of labour welfare measures, along with the daily wage?

Table 5 (N 64)

Q.5.		Q.7.				Q.9.		
Have you Demanded Any welfare Measures From your Employer/s At any time		Do you think that the Welfare measures to labourers will cause Increase in wage rate, which may result in Unemployment For labourers				If welfare measures are provided, How far the satisfaction of the Labourers be increased?		
Yes	No	Yes	Undecided	no	Nil	Least	considerably	extremely
11	53	41	13	10	3	13	26	22

VII. FINDINGS

1. Only 17% of the labourers in the unorganised sector get any benefit that could be considered as welfare measures. Vast majority do not get any benefit other than their normal daily wage.
2. Contribution of the employer/s towards welfare measures has been limited to food and conveyance. That too is meagre, 39% get food and another 15% bet conveyance charge.
3. The finding that 78% of the respondents believe that labour welfare measures are admissible only for factory/industry employees only is alarming.
4. A vast majority, i.e. 64% believe that demanding labour welfare measures may cause to increase wage rate. Thus they fear that this increase in wage rate may cause unemployment, as the employer might not be ready to bear additional liability.
5. But, 47% have the opinion that, if there is an attempt for sanctioning labour welfare measures for UoS, that particular responsibility shall be borne by the individual employers and the government, combined.

VIII. CONCLUSION

The investigation had been planned and implemented against the hypothesis that the labourers in the unorganised sector in India live in a situation of poor knowledge, understanding and attitude towards labour welfare measures. This assumption has been proved with the support of data collected randomly from different geographical and political representations. The subject of the study, i.e. the labourers in the unorganised sector, like: Head load workers, Masons, Carpenters, Tillers of the soil, Domestic servants and Paintersare not sufficiently aware of the labour welfare measures to be admissible to them by their individual employers, against their counterparts in the organised sectors, like: railways, manufacturing industries and ports. As unorganised, the Head load workers, Masons, Carpenters, Tillers of the soil, Domestic servants and Painters have poor bargaining power, also.

Above findings and the conclusions based on that have certain implications in a democratic and highly populated nation like India. It is better to think of these implications in the form of actions.

WHO SHOULD DO WHAT?

The state governments should go for new legislation in unorganised sectors for the labour welfare measures. At present there are certain attempts of the state governments for mobilising labour welfare funds. For example, in Kerala, there are funds named: Fund for Motor Vehicle Drivers, Fund for Labourers in Building Construction and Fund for Toddy Tapping Labourers. These funds are raised by the equal contribution of the labourers, individual employers and the state government. It is with the source of the fund, welfare measures are sanctioned to labourers in respective sectors. Another scheme that has been implemented nationwide is the Pradhanamantri's Pension Scheme for the labourers of the unorganised sectors. With such schemes the governments have proved their responsibility in providing welfare measures for the labourers in unorganised sectors. Let the governments come forward with more schemes for all the labourers in the unorganised sectors. For the realisation of the schemes, contribution of the individual employers and local self-governments can also be levied.

CONTRIBUTIONS OF THE STUDY

The findings of the study contribute certain notable points for the creation of new knowledge in the field.

a) The general focus of the researchers so far was with the employees in the organised sectors like, railways, ports or factories. But this study focuses on the employees in unorganised sectors, which were unattended by the researchers.

b) This status study reveals the need for intervention of the governments and policy makers in solving the dissatisfaction of the employees in unorganised sector.

c) The dissatisfaction of the employees traced out through the present study is the voice of the voiceless, who also form the basic category of the society. This is a poser to the society for taking initiative in providing welfare measures to them. Such a feeling has also been created through the study.

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APPENDIX 1

Instrument for measuring the level of knowledge on labour welfare measures

Dear respondent,

Please give your own responses to the questions. Your responses will be kept confidential. The responses will be used only for research purpose.

Roney Rose

Ph D Scholar

Karpagam University

Part 1

a) Name of the respondent:

……………………………..

b) Age group: /18-25/26-35/36-50/51-60/above 60/

c) Name of the rural / urban area……

d) Name of state / union territory…

e) Category of labour:

- Head load worker
- Mason
- Carpenter
- Tiller of the soil
- Domestic servant
- Painter

f) Average income for full-time work (minimum 8 hours) of a day.

Rs. /0-199 / 200-399 / 400-599 / 600-799 /800 and above/

h) How many days' full- time work do you get in a week?

a) /0-2 / 3-4/5-6/

- -

Part 2

1. Do you get any additional benefit other than the wage from your employer/s?

a) Yes
b) No

2. Can you say certain welfare measures provided to the labourers in companies or factories?

a) ………………….
b) …………………………..
c) ……………………………..

3. "Only the labourers in companies or factories are eligible for welfare measures." Do you agree with the statement?

a) Strongly disagree
b) Disagree
c) undecided
d) Agree
e) Strongly agree

4. Do you enjoy any of the following welfare measures?

a) Educational benefit
b) Recreational facilities
a) c) Food (free or subsidised)
c) Conveyance
d) Medical assistance for family
e) ………… any other (specify)

5. Have you demanded any welfare measure from your employment-donor at any time?

a) Never
b) Rarely
c) Occasionally
d) Frequently

6. According to you whose responsibility is that to provide welfare measures to the labourers who belong to the unorganised sectors like yours?

a) employer only
b) Government only
c) Employer and government combined
d) The local self-government
e) ………….. Any other (specify)

7. Do you think that the welfare measures to labourers will cause to increase wage rate, which may result in unemployment for labourers?

a) Yes
b) Undecided
c) no

8. 'Labourers in unorganised sectors are neglected of welfare measures due to poor bargaining power 'How far do you agree with the statement?

a) Strongly disagree
b) Disagree
c) undecided
d) Agree
e) Strongly agree

9. If welfare measures are provided, how far the satisfaction of the labourers be increased?

a) nil
b) Least
c) Considerably
d) Extremely

10. "Welfare measures lead to increase standard of living of the labourers" Do you agree with the statement?

a) Strongly disagree
b) Disagree
c) undecided
d) Agree
e) Strongly agree

National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Mask Detecting Using Ai

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ABSTRACT

The main concept of this project is to design a mask detecting system so as to control the high rate of covid. Using face detection algorithm we can implement this project. The modules used are Keras, Tensorflow and Opencv. This has two phases in the first, train the data using dataset and test the data then apply it in the second phase.

Keywords: Keras, Tensorflow, Opencv, Face Detection, Face Recognition

I. INTRODUCTION

Artificial Intelligence is both an art and a science. Artificial Intelligence is the intelligence of machines to behave like humans. This can be done through training the machine with appropriate data. Artificial intelligence emerge as a separate field during 1940. During 1950 Alan Turing developed Turing Test to test whether the machines are capable to complete human intelligence. In 1955 John McCarthy coined the term artificial intelligence. The first robot was introduced in 1961 and Eliza was the first chatbot based on Natural Language Processing. IBM's Deep Blue, a chess playing computer was introduced which beats the chess world champion. Artificial Intelligence can also help in this corona situation. As the amount of covid patients are increasing, in this alarming situation we can do something which can limit the high rate of covid. The one reason of the increasing rate is the community spread. This community spread can be limited by using our technology itself.

Artificial intelligence is playing a good role in every sectors of the world; this technology can also play well in this pandemic. For the public safety authorities had made the use of masks compulsory but even though there are people who are not responsible about the society and the health. If we have a look at the business sector, it is growing day by day so the safety of the employees and the customers should be a great concern, by introducing this system we can bring up a great change.

It is not like we can completely remove the virus spread using this system but even if we can limit the spread. A mask detecting system using artificial intelligence can help the entire mankind to save their life. The paper aims to design a system which can identify whether a person wear mask or not, if a person is not wearing mask properly it will generate an alert. The product will be trained sufficiently with a lot of data of people with mask, wearing mask improperly and without masks. After the proper training and testing the system will be able to give

proper output. If they don't wear mask in a proper way or in the case not at all wearing masks it can alert the authorities about this. The system will have access to the cameras through that the images can also be captured; this system can connect with the existing cameras.

The notification will be sent to the staff or the worker of the place. The alarm generating system also can be implemented in this system. If it is installed in a public place then also the image will be captured and he data will be send to the authorities for taking actions. If it is in a place like supermarket then together with sending the report it will generate a notification to the workers to aware the customer about this. For example, this product can be implemented in a super market. Face Mask Detection System uses existing IP cameras and CCTV cameras combined with face detection technique to detect people without masks.

II. METHODS AND MATERIAL

The proposed system has the ability to screen people to know whether a person is wearing mask or not and if the person is wearing mask it will check it is properly used or not. This automated smart system can work with a high accuracy. As we all know now in all cities, public places CCTV cameras are installed, using this camera we can capture the images of the people and can be feed into the system. If any person found the images can be send to corresponding authorities for taking further actions. Here we use the face detection method and a python program to send the file.

If we are using this system in a super market or shops the product uses the existing camera to detect whether the people. After analysing the collected data messages and notification will be passed to the workers over there or an alarm will be generated inorder to notify the people. The notification will be send to the workers as a message then he/she can trace the violator. After that the data will be send to the corresponding authorities for further actions. We can also thank the workers and customers who are using the masks properly. Here we use face detection to detect the mask, face recognition to identify the worker in the supermarket, and python codes for sending notification to the worker and data to the authorities. It can be connected with any surveillance system in your premise. When someone enters in your premise without the mask it will generate an alarm. The accuracy rate is 95%-97% depending upon the digital capabilities. The data can be stored in the system automatically. The advanced detection technology has various attributes like,

1. Location of faces
2. Face orientation
3. Location of eyes
4. Types of masks
5. Occlusion degree

III. RESULTS AND DISCUSSION

'The Hindu' newspaper reported the result of a survey done by ApnaMask, an initiative by EkDesh that 45% of respondents of age group (26-35) assumed that as social distancing, a mask is not required. In analysis it is clear that 48% of the people are affected by the disease sue to the improper use of mask and 35% affected because of not keeping social distancing and only 17% are affected due to other reasons. It's clear that the major cause of the disease is the improper use of mask by the people. For example, most of the people take off the mask and speak to others in public. It can cause the spread of the disease. This is a major problem as the rate of COVID patients are increasing day by day.

A. Design

We are designing our product using python programming, the modules used are opencv and Keras

and Tensorflow. The algorithm is face detection algorithm. The product having two phases that is phase 1 and phase 2. In phase one the product will train face mask detector and in phase two we apply face mask detector.

Phase 1: Train Face Mask Detector

A dataset will be stored with images of people with mask, using mask properly and without mask. Using the dataset we train the product by loading the dataset to the program. Then trains the face mask classifier with Keras and Tensorflow modules after that serialize face mask classifier to disk. Here the phase1 training is finished, move to second phase.

Phase 2: Apply Face Mask Detector

In phase2 we load face mask classifier from disk and then detect faces in image/video stream after that extract each face to determine if mask is used or not and is used properly or not. Here the face mask detector finish its process and next is to show the results.

The design of the product is:

1. Interface - It will have a user friendly interface. The product can be connected with existing cameras or new IP cameras. If the camera captures an unrecognized face, a notification can be sent to the authorities.
2. Real-time Monitoring Dashboard - Real time monitoring is provided. When a person is identified then the image will be captured at that time itself.
3. Notification Interface - If a person is identified in public places then the system will send the data to corresponding authorities for further procedures. If in shops then together with sending the data the workers will get a notification message to aware the customer.

B. Features of Face Mask Detection System

Face detection system has following features-

1) Automatically Send Alerts: Send alerts to the people.
2) Multi-Channel Recognition: It can access multiple cameras.
3) Real Time Reports: Providing real time notifications and reports. For example, in a supermarket if a customer is purchasing items without mask the worker will get a notification about this so the worker who is assisting the customer can notify them to wear mask properly and the report about this will be send to the authorities for further proceedings.

C. Figure

The figure shows an accuracy training curve of about 100 epochs. The model is trained with a lots of data for better performance. The model shows the accuracy of 97%.

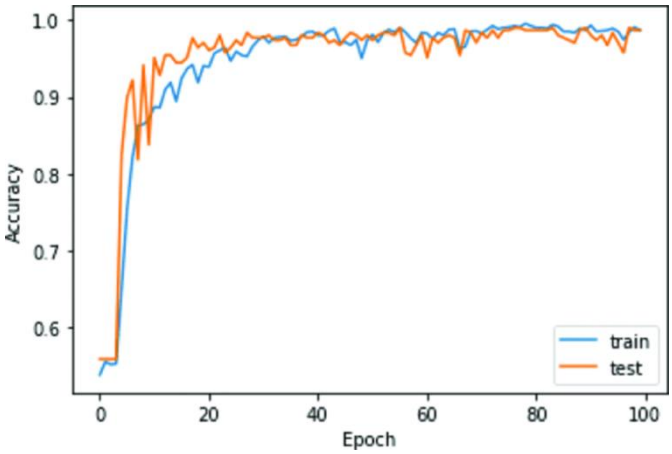

Figure 1: Accuracy of the system after training

IV. CONCLUSION

Although a conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. Many people are working in the AI field for its development, leveraging technology at the service of humanity and the pandemic. The technology is reliable and real time face detection of users wearing masks. The system is can use the existing cameras for its data access. So this can be a

leading digital solution against the COVID-19. The system can generate real time alerts. Face mask detection feature use visible stream from the camera combined with the face mask detecting technique to generate corresponding output. A user friendly interface allows monitoring and review of alerts generated by the system. The proposed system can be a valuable tool in this situation to strictly impose the wearing of masks in public.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

An Approach on DNS Amplification Attacks

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ABSTRACT

Attackers use DNS as a weapon against unsuspecting victims to bring down their websites. In the past and now in the present Domain Name Servers are under the threat of DOS attacks. This kind of attack takes benefit of the fact that DNS response message may be substantially bigger than DNS query message. The attackers vastly exploit open recursive DNS servers mainly for performing bandwidth consumption DDos attack. In this paper our analysis is based on DNS amplification attacks and ways of DNS attacks protection.
Keywords : DNS, DDOS, amplification, DNSSEC

I. INTRODUCTION

Internet is growing day by day with new development and users. Also attackers still there in order to achieve an unauthorized access or to cause a DOS in the provided service.

DOS attacks can be classified into 2; First one is ping of death, adversely featly craft packets try to utilize the vulnerabilities in the implemented software (service or protocol) at the target side. In the second one; the attackers attempt to overwhelm critical system's resources. i.e. memory, cpu, network bandwidth by creating numerous of well-formed but bogus request. This type of attack is also well known as flooding.

As we know, computers can't understand our language and they go by numbers which means they use numbers to operate, communicate and store data eg: I p address,PID,0's and 1's.

DNS is an acronym for Domain Name System which contains number like physical address instead of human readable domain name like example.com. DNS resolves domain name to I p addresses. When a user enters a web address into a web browser, DNS will resolve the name to I p addresses. So this is how DNS server works. When we move through the timeline of networking, one of the most recent attack are reported in October 2002, 8 out of 10 root DNS servers were a massive DOS attacks and move attacks were triggered against these DNS in 2003 and 2004.Also in February 2004, name servers hosting top-level Domain [TLD] zones were the frequent victims of vast heavy traffic loads.

In this research paper, our centre of attention is DNS amplification attacks, types and prevention.

II. DNS SECURITY ISSUES AND VULNERABILITIES

The Domain Name System is hierarchical, distributed database that maps human readable domain names to I p address, DNS help users to find resources on the network by converting human readable names like xyz.com to ip address that computer can connect to. DNS is like an index of book which by converting the domain names to unique ip address. For example www.abcd.com translates to the addresses 20.52.88.12. DNS is one of the most crucial parts of a computer networking and scuring it is most important task. If we make compromised, an attacker can easily prevent normal operations going in the network, can route computer to whatever spoofed ip address they like and steal information.

The Domain Name System are still under cyber-attacks. There are many relevant threats:

DDos attacks on name servers: attacker targets one or more DNS servers belonging to a given zone, attempting to obstruct resolution of resource records of that zone and its sub-zones. DDOS attacks are from multiple sources, DDoS attacks achieve effectiveness by using multiple computer systems as sources of attack traffic. Usually, attackers deploy bots to attacks the target with traffic. If the attacks are from a single source or computer is known as a Denial of Service (DoS) attack and is mostly has minimal effect.

DNS amplification attacks: DNS amplification is an asymmetrical DDoS attack in which the attacker can send small query with spoofed target IP, making the spoofed target the recipient of much larger DNS responses. With these attacks, the attacker's goal is to overload the network by continuously exhausting bandwidth capacity.

DNS spoofing: it is also known as cache poisoning which is attacker stores corrupted or incorrect data in dns resolver's cache. These lead users to incorrect websites instead of actual website.

Cache poisoning attacks typically occurs in a way that the attackers impersonate a DNS name server

They send request to a DNS resolver

They forge a reply to the DNS resolver before the actual DNS name server can answer.

DNS has three major vulnerabilities in which attackers often exploit to abuse DNS:

All the server names and IP addresses for their domains are stored in Internal DNS servers and will share them with anyone that asks.

So the DNS plenty of information for attackers when they're trying to do internal reconnaissance.

DNS caches aren't "authoritative, and they can be mishandled or corrupted.

If your DNS server is "poisoned" with bad records, this leads computer to location instead actual one.

DNS relays query information from internal workstations to outside servers, and attackers have learned the way to use this behavior to form "covert channels" to exfiltrate data.

Internally, one of the largest threats to DNS infrastructure is the DNS server itself. DNS server software is complex, with millions of lines of

code, and that much code is going to avoidably result in vulnerabilities that an attacker can gain access to a network.

III. DNS AMPLIFICATION ATTACKS

1. DNS Spoofing

A DNS spoofing attack is one in which a victim, or victims, is misleaded along DNS to a host that is not the desired destination. Cache poisoning is one type of DNS spoofing attack, but there are many other types of DNS spoofing attacks that do not affect cache poisoning at all.Trojan known as Win32.QHOST is one example for DNS spoofing.

A fle called hosts is built into all version of microsoft windows operating system. The file sits in the directory C:\%windir%\system32\drivers\etc
\hosts and is used to map IP addresses to system names or domains. The file is a reminder to days before DNS Existed, and it enables interaction among machines on a network regardless of whether or not DNS is configured. Typical hosts file looks
Like this:

```
# Copyright (c) 1993-1999 Microsoft Corp.
#
# The following is a sample of HOSTS file developed by Microsoft TCP/IP for Windows.
# For example:
#
# 102.54.94.97 rhino.acme.com # source server
# 38.25.63.10 x.acme.com # x client host
127.0.0.1 localhost
```

A less common method of Domain Name Server spoofing is to use a specialized tool sitting on another host on the same network to ambush and react to DNS queries coming from the destination host. This method is a little more problematic
because it needs that the attacker already has the permission to the target network and is able to install a network sniffer on the network without being identified.
One of the tools that can be used for this type of attack is dnsspoof and it is one of the dnsniff penetration toolkit

2. Cache Poisoning

In a DNS cache poisoning attack intruder takes use of the weakness in the DNS protocol to load bad data into a recursive DNS server and that data usually involves transmitting a fake A record to the recursive server in order to divert traffic to infrastructure owned by the attacker. The simplest form of this attack is to send additional A records with a request to a malicious domain To understand how this attack would work, lets check the traditional DNS request from the victim perspective and the DNS recursive server perspective.
This is the user request:

```
[user@workstation B]# host dns-book.net dns-book.net
 has address 8.5.1.36
dns-book.net mail is handled by 10 p.nsm.ctmail.com.
```

The recursive DNS server checks for the A record, and it also checks for the MX record and stores it in its cache so if other clients of this recursive DNS server need that data it usually be available, at least until the Time to Live (TTL) expires.
In order to know how cache poisoning works, mainly we need to understand DNS at the packet level. A DNS packet includes three parts: Header, Question, and Answer .The header has a permenant size of 12 bytes while the Question and Answer sections differs in size. Because most DNS queries and returns are transferred over UDP, there is a packet size limit on the packet size of 512 bytes and also, because DNS and responses use UDP there is no handshake between the recursive and authentic name servers. Instead the DNS server depends on a combination of source port, original destination IP address, and a 16-bit transaction ID in order to certify an incoming return.Forging a DNS packet is commonly simple; by the way there are a number of tools that help spammers create a forged DNS packet and since the protocol is delivered using UDP forging an IP address is insignificant. A forceful tool for forging DNS, and other, packets is hping3. Using hping3 a spammer can create forged DNS packets that looks exact as they came form the random addresses:

```
[root@server B]# hping3 -2 -p 53 --rand-source 8.8.8.8
```

This command directs hping3 to forward DNS packets from randomly forged IP addresses to the name server 8.8.8.8.Another method of DNS cache poisoning is the local DNS cache poisoning attack. This attack does not cause the client's recursive DNS server; by the way it infects the DNS cache directly on the client's

workstation. Many people doesnt know that, by default, Windows and Apple OS X workstations keep continuing a local DNS cache based on responses from the organized recursive server. The local cache boosts the method of visiting recurring queried domain names. Unfortunately, this is also insignificant attack vector to exploit.

3. DDOS using DNS

A DNS-based DDoS attack simply means sending more traffic to a target server in which server can't process. At that point, the services on the server become unavailable and legitimate users may not able to access them or can only access those services sometimes or infrequently.

There are a number of tools are used to launch this type of straightforward DDoS attack, probably one of the best known is Low Orbit Ion Cannon(LOIC), LOIC was originally developed in 2004.This tool was widely used by attackers because it is simple to use and both runs n windows and linux platforms. It is also versatile in which it can be used to create attacks against a various services running on a target host.

While the tool is easy to use, it is not covert. All of the packets launched from the tool are directly tied to the attacker. However, when used as part of a larger group, unlikely any of the attackers will be singled out for execution.

DNS amplification attacks are DNS DDoS attacks, a series of small DNS Queries used to generate larger DNS responses. By ip spoofing these responses are directed toward a target host. This type of attack may include up to three different victims. The first victim could be the host or attacker launching the query with target address and may be an unwitting member of a botnet, unaware that malware being used in a DDoS attack is installed on his/her computer. The second victim is the DNS server that is being queried by the victim hosts and the third victim is the target itself.

To understand how these attacks work, take a look at this dig request:

Where the dig is a command used in DNS servers for querying for information about host address and related information

dig@PDNS-PUBLIC-NS1.POWERDNS.COM
powerdns.com ANY 1 dnssec

The query is pretty simple; it asks the Power DNS name server to provide all known records for the domain powerdns.com. The query also asks for any DNSSEC information. At 17 bytes the query is a small one, as shown in this tcpdump output:

0:41:56.231234 IP (tos 0x0, ttl 53, id 37793, offset 0, flags [1], proto:
UDP (17), length: 1500) 188.166.104.87.domain . 192.168.1.15.49890:
57446-| q: ANY? powerdns.com. 14/0/1 powerdns.com. Type46[|domain]

However, it returns a big response, the dig output shows that the resulting response switched to TCP and returned 2977 bytes.

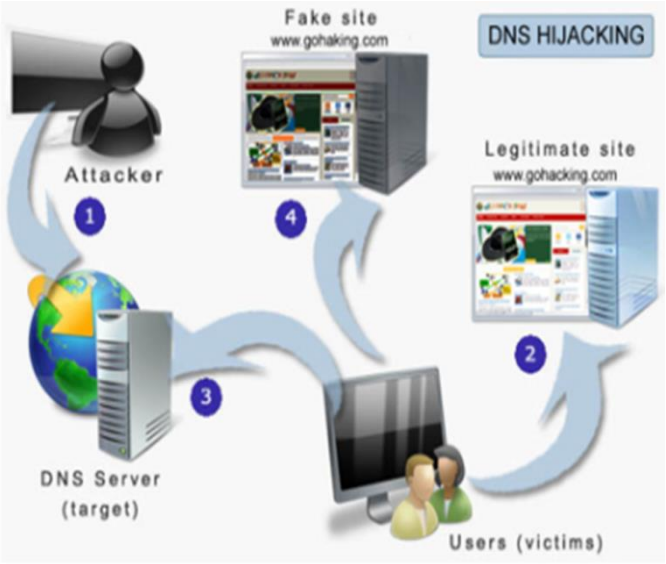
;; Query time: 82 msec
;; SERVER: 188.166.104.87#53(188.166.104.87)
;; WHEN: Mon Feb 1 00:41:56 2016
;; MSG SIZE rcvd: 2977 in other words, this response is 175 times larger than the query used. An attacker Can controls thousands of hosts within a botnet can easily send thousands of queries from the victim botnet members within a certain period of time to the

DNS server and direct the results of those queries to the target host, easily taking it off-line. Using a small query to produce a large amount data and redirect that large data into a victim Server.

IV. DNS HIJACKING

Attackers get benefits of the DNS system to send victims to fake websites address, using a technique called DNS hijacking.

In DNS hijacking, attackers redirect their victims away from the popular websites that they want to visit, using DNS-related tricks to bring them to fraudulent sites. These fake websites are generally designed to look like the legitimate site, and aim to steal the victims login credentials or credit card details. Hackers then use this information to access their commit fraud or accounts and other crimes.



In another way, through DNS hijacking attacker send victims to websites that host malware. This could consist of ransom ware, spyware, adware, Trojans and a range of other malicious programs. Using these malware hackers can get and operate whatever he want to do in victim side, use its information to threat, access accounts and money. The attacker user's different types of techniques to redirect user from intended websites to malicious page.

- **Local hijacking –** in this type of DNS hijacking includes an attacker installing malware on a target victim's computer, then changing the local DNS settings to divert them to a malicious site instead of the intended webpage.
- **Router hijacking –** Attackers can take advantage having Routers firmware vulnerabilities or still using default passwords. So this security weaknesses,make the attackers to access and reconfigure the router's DNS settings. If they change the DNS settings for certain sites to those of a malicious site, any victim connecting through the router will be diverted to the malicious site when they try to access the websites that had been altered.
- **Compromised server –** Hackers can compromise DNS servers and update their configurations so that the IP addresses of targeted websites actually point to sites under the control of the attackers. When a victim's machine sends a DNS request to one of the targeted websites on the compromised server will be redirected to the malicious website, where they might encounter malware, phishing or pharming.
- **Man-in-the-middle DNS hijacking –** In a man-in-the-middle attack, cybercriminals put themselves into a communication channel and either listen or alter the messages.by intercepting the messages sent between a DNS server and a user. The attacker alters the DNS server's response to the IP address of their malicious website, redirecting the user to the malicious site.

V. DNS SECURITY BEST PRACTICES

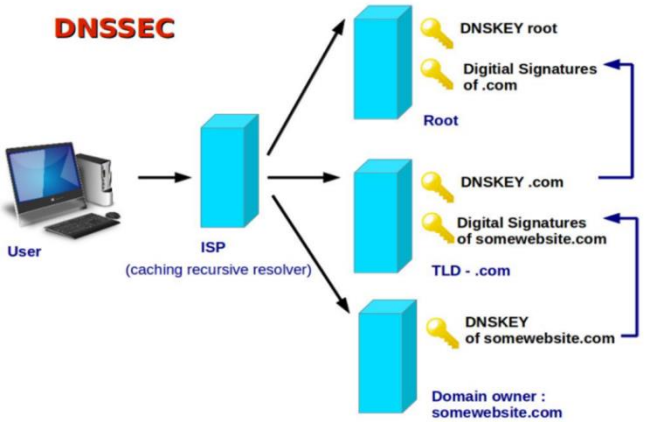
- Enable DNS logging-Most efficient to monitor dns activity is dns logging. Using logs ,it let you know if someone mess with your DNS server. Unlike client activity, debug logs shows when there are issues with DNS queries or updates. DNS logs also results the traces of cache poisoning. In case of cache poisoning, an attacker change the data stored in the DNS cache and send to clients. For example, an IP address of www.facebook.com

might be changed to an IP address of a malicious site. When a client sends a query to DNS for facebook.com, the server redirect with the wrong IP. Users then visit websites they intended to visit instead of actual and become a target of hackers. To achieve better performance, some system admins decide to disable DNS debug logging. Monitoring network activity can help you identify some attacks, such as DDoS, but not cache poisoning. Therefore, enabling DNS debug logs is good in informing attacks.

- Lock DNS Cache-DNS finds the information corresponds to the query from client and stores it in the cache for future use. Through this process server can respond faster to the same queries and fetch information from cache .but Attackers utilize this feature by altering the stored information. By enabling DNS debug logs is locking DNS cache. If cache locking is deactivated, then information can be overwritten before the TTL expires. This leaves room for cache poisoning attacks.
- Filter DNS Requests to Block Malicious Domains-DNS filtering is an effective way to block users from accessing a domain, if domain is known to be malicious. DNS server stops client when client query for a blocked website. DNS filtering greatly reduces the possibilities of viruses and malware reaching your network.
- Validate DNS Data Integrity with DNSSEC [Domain Name System Security Extensions] DNSSEC secure clients receive valid responses to their queries. Data integrity is achieved by DNSSEC .When an end-user sends a query; a DNS server provides a digital signature with the response. Hence, clients receive valid data for the request they sent. Since DNSSEC provides data integrity and origin authority, DNS spoofing attacks and cache poisoning are successfully prevented.
- Configure Access Control Lists-It covers DNS servers against unauthorized access and spoofing attacks.

VI. PREVENTION TO DNS AMPLIFICATION

- DNSSEC - DNSSEC establish a trust chain between the user and authoritative server.when a user sends a query,the DNS server provides a digital signature along with the response.Based on a key exchange inside specific signed resource record.



- Maintaining Your System Up to Date .Updates latest version of all software and programs aiming its security.
- Prevent resolver from cache poisoning, so it is kept restricted from external user.
- The cache in DNS should clear on both local as well as extensive area networks.
- Installing a reliable and powerful firewall is the best way in preventing DDoS attacks.

VII. CONCLUSION

We have presented our analysis about DNS attacks.And discussed types of DNS amplification attacks. Also the weakness in the DNS systems and ways to its protection.

DNS is the backbone of internet. Much of the DNS infrastructure has flaws, unprotected and under threat of attackers.so it requires more updations to make it

secured. DNSSEC was one of the best security practices for DNS server's .In future still has chances for more aggressor attacks can be done. From now we can initiate to build programs and techniques can be implemented at DNS servers and requires new research in building a powerful DNS infrastructure.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Security on Mobile Devices Using Biometric Authentication

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ABSTRACT

Mobile devices contribute an important place in society and other aspects of life. Most of the people inherit a weak traditional authentication mechanism, which can potentially be compromised and thereby allow attackers access to the device and its sensitive data. This problem can be undone by the implementation of biometric authentication on mobile devices, which can replace the traditional method of entering password or PINs with the swipe of a finger so that the phone can be unlocked and used. Biometric methods embedded in mobile phones include fingerprint recognition, face recognition, voice recognition, etc. Biometric technology performs individual authentication based on the physiological characteristics and behavioral characteristics. The aforementioned biometric security systems for mobile phones are not only making the mobile phone tauter, but they are also making the usage of cell phones easier and even more entertaining.

Keywords : Biometric authentication, Biometric technology, Mobile devices, biometric security system

I. INTRODUCTION

The potentiality to communicate and work at the same time as journeying has given rise to an eruptive growth in the mobile devices. People began to bother about their sensitive personal data due increased number of smart phone users, which may eventually create a bad circumstance like stealing or misusing details about financial data, medical information, personal identifiers, etc. From this perspective, authentication plays an important role to help establish proof of identity.

Identification or authentication of proper user is the key part of the access control over the devices which build up a structure of any security. The traditional method of user identification or authentication is generally based on a PIN, a password or a passphrase. This study employed smart phones as the platform for implementing biometric based authentication. According to the growing usage of mobile security, biometric verification of personal identification and authentication became more popular among users. About 75 per cent of online users have experience of authentication failure by forgetting password, username, etc.

Biometric are not based on what the user knows, but who the user is, and their characteristics. After making further clarification about this concept, this paper considers the biometric techniques that could be established on mobile devices, along with a brief example of a practical implementation. Biometrics consists of computerised methods based on the

physiological or behavioural characteristics. These characteristics are distinctive and not varying or exchangeable. It is important to study the user requirements and preferences while implementing biometric authentication on smart phones, as it is common for people to use smart phones daily.

The precedence of biometric technology is that it contributes ease and security because human fingerprints and faces are intricate to steal and mould. The major intention of this paper is to scrutinize the dependability and viability of each biometric method for being used in the authentication of mobile phones in the ongoing trends.

II. METHODS AND MATERIAL

Biometric can be classified based on the unique characteristics of an individual and can be categorized into physiological and behavioural characteristics. Physiological characteristic means to classify a person based on their physical elements like face, fingerprint, etc. Behavioural characteristic means to classify a person based on their unique behaviour such as voice signature

III. RESULTS AND DISCUSSION

Physiological and behavioural biometric authentication methods that are used in mobile devices include the following:

A. Fingerprint Recognition

The frequently used physiological biometric is the fingerprint recognition, which is based on minutiae, a reproduction of epidermal friction skin ridges seen on the palm side of thumbs and fingers, soles of the feet, palms. These are the particular property on which most of the technology based on fingerprint is implemented. The main advantage of this type of biometric is that an individual fingerprint will not change during lifetime and no two fingers possess identical characteristics.

B. Facial Recognition

This type of physiological biometric makes use of different features of human face like distance between eyes, nose, mouth, jaw edges, area around the cheek bones, these features may change a little over time. The advantage of this technique is that it does not require any additional hardware or software because most of the smart phones are now available with a built-in camera, which records the face images and then analyse the facial characteristic for identification.

C. Iris Recognition

The iris consists of tangled patterns with furrows and ridges, which is a coloured tissue around the pupil o human eye. In mobile devices, this type of physiological biometric ensures security by the unique pattern of the iris, which can be used for individual identification through a photograph of eye.

D. Voice Recognition

Voice recognition is a behavioural biometric that authenticates a person by their vocal characteristic. It provides consistent user experience, since it uses an individual's voiceprint which is unique. This system guarantee reliability and security

E. Signature Recognition

This type of behavioural biometric used in mobile devices try to authenticate people with their handwritten signature. The two basic processes to signature recognition are static and dynamic. In static, the completed signature is compared to a class of template and authentication is provided on the basis of comparison. In dynamic, behavioural components such as speed, stroke order and pressure are also estimated along with the completed signature in order to provide authentication.

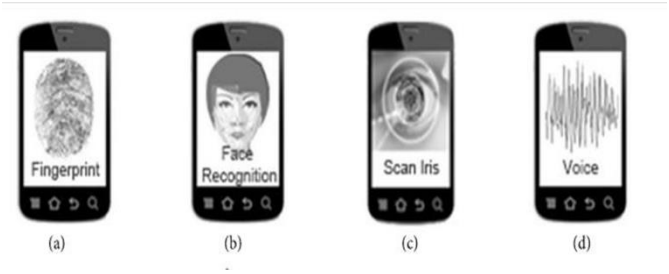

Figure 1: (a) fingerprint recognition, (b) face recognition, (c) iris recognition, (d) voice recognition

IV. CONCLUSION

Nowadays, mobile devices are transforming with merged ability to have preeminent computer processing on smart phones and menacing achievement of the mobile phone industries. In human life, people are no longer chained to their mobility. This had created a vital situation in authentication for identification and verification of a unique person. The traditional authentication is very weak but tolerates a number of fragility. If the phone is stolen or lost, the data can be used for performing malicious activities. These kinds of situations can be overcome by definitive authentication technique for mobile devices using biometric because it is most powerful authentication tool based on unique human characteristic.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Big Data Analysis for Consumer Behaviour in Mobile App Usage

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ABSTRACT

The rapid elevations of technology on the use of mobile application have become exceptional and greatly influential in today's living era. Big data analysis on mobile app usage let you understand which elements and features of your mobile app make users spend more time and which makes them depart. We can use this information to create a list of features that users need, plan for changes and modification in the design, therefore improves user experience and maximize engagement and troth. The identified analysis helps developers improve existing and design new mobile apps to satisfy unfulfilled requirements of the consumer.

Keywords : Big data, Mobile app, RFM

I. INTRODUCTION

Big data refers to "datasets whose size is beyond the ability of typical database software tools to capture, store, manage, and analyze". Such data are transforming the way that companies operate. Big data analyses challenges include capturing data, data storage, data analysis, sharing, transfer, querying, updating of data source. Big data is mainly associated with three main concepts: volume, variety and velocity.

- **Volume**

It is the quantity of generated and stored data. The size of the data determines the value and possible insight, and whether it can be considered big data or not. The size of big data is usually larger than terabytes and petabytes.

- **Variety**

It refers to the type and nature of the data. The big data technologies evolved with the prime intention to capture, store and process semi structured and unstructured data generated. Later these tools and technologies were identified, analyzed and used for handling structured data.

- **Velocity**

It is the speed at which data is generated and processed to meet the demands and challenges that lie in the path of growth and development. Big data is produced more continually as compared to small data. Frequency of generation and frequency of handling are the two kinds of velocity associated with big data.

BIG DATA FOR CONSUMER BEHAVIOR

Consumer behavior study is a new, versatile and emerging science, which is been developed. Its main source of information comes from a large area of sources. Consumer behaviour is concerned with

understanding how purchase decisions are made and how services are provided. Big data analysis uncovers patterns in a large variety set of data and associates the pattern with the business outcomes. Big data analysts use certain analytical techniques and big data tools to detect unusual, interesting, previously unknown, new pattern in the data analyzed. Here customer data is mined to determine which segments and categories are likely to react. Initially, the data is been collected and then the data is analyzed and later the results are interpreted to define the solution to your question. Consumer behavior is been analyzed with four different types of data analysis.

- ✓ Descriptive analysis: It is the simplest and most common type of data analysis. It answers the question of what happened, by tracking Key Performance Indicators (KPIs).
- ✓ Diagnostic analysis: It takes the insights found from descriptive analysis and drills down to find the cause of those outcomes. It creates more connections between the data and identifies patterns of behavior.
- ✓ Predictive analysis: This analysis utilizes previous data to make prediction about the future outcomes. It is during this analysis where many organization show signs of difficulty.
- ✓ Prescriptive analysis: It is the frontier of data analysis combining the insights from all previously performed analysis.

All these type of analysis are connected and dependent on each other, and also unlocks more insights.

II. METHODS AND MATERIALS

RFM ANALYSIS

RFM analysis (Regency, Frequency, Monetary analysis) is a technique used to determine quantitatively which customers are the best ones by examining how recently a customer has purchased (Recency), how often they purchase (Frequency), and how much the customer spends (Monetary). The essence of RFM analysis is to divide the customer into different groups.

RFM segmentation is a great method to identify groups of customers and target specific clusters of customers that are more relevant to a particular behavior. RFM is popular for three reason.

- Simple
- Intuitive
- Utilizes objective

Performing RFM Analysis and RFM segmentation

Step 1: The first step is to assign recency, frequency and monetary values to each app downloads of the customers. The raw data for doing this step should be readily available.

Step 2: The second step is to divide the customer's download list into tiered groups for each of the three dimensions using any tools available. Unless using any specialized software, it is recommended to divide the customer's download into four tiers for each dimensions, such that each category of mobile app downloaded by the customer will be assigned to one tier in each dimensions.

Recency	Frequency	Monetary
R-Tier-1 (most recent)	F-Tier-1 (most frequent)	M-Tier-1 (highest spend)
R-Tier-2	F-Tier-2	M-Tier-2
R-Tier-3	F-Tier-3	M-Tier-3
R-Tier-4 (least recent)	F-Tier-4 (only one transaction)	M-Tier-4 (lowest spend)

Step 3: The third step is to select groups of categories to whom specific types of communication will be sent based on the RFM segment in which they appear. It is helpful to assign names to segment of interests.

Step 4: The fourth step actually goes beyond the RFM segmentations.

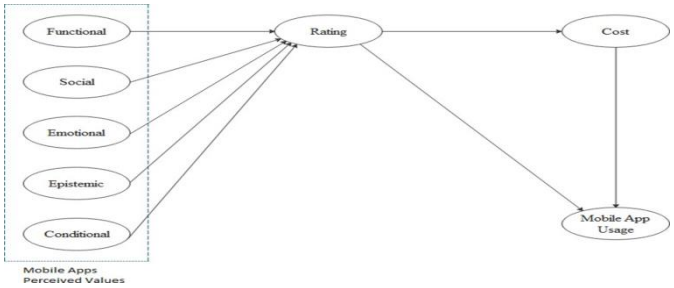
KEY CHARACTERISTICS FOR A SUCCESSFUL MOBILE APP

After the RFM analysis and segmentations performed the key characteristics identified for making a mobile app successful tend to be

- Solve a problem
- Focus on a core feature
- Keep it simple
- Developed for iOS and Android
- Provide offline functionality
- Offer it free
- Personalized experience
- Regular updates

III. RESULTS AND DISCUSSIONS

Overview of some studies related to mobile apps in year 2020



- ✓ Mobile apps consumer perceived functional value: Functional value of a mobile application is one of the greatest consideration gained by a particular user for specific functional requirements or service provided by the mobile application. The functional value provides a great extent of benefit to the users, which encourages the user to give a higher rating. The mobile app should fully satisfy the user with its own functional value.
- ✓ Mobile app consumer perceived social value: Social value of a mobile application is the social benefits that are gained by a particular user with the usage of this app. The benefit may be positively or negatively related to a profile. It said that a great amount of social value is been influenced by the customer with the interaction towards certain app.
- ✓ Mobile app consumer perceived emotional value: Emotional value is related to various affective state of a user. i.e excitement, positive, negative, fear, anger, confidence, etc.. Emotions are related to the relationship between a smart phone device and its user.
- ✓ Mobile app consumer perceived epistemic value: Epistemic value refers to the act of curiosity or desire for knowledge. This value is been perceived by continues usage or addiction of certain mobile applications.
- ✓ Mobile app consumer perceived conditional value: Conditional value occurs as the result of changes in the consumer's buying preferences in certain situations that may be seasonal, lifetime, unplanned, emergency situations. Here these may vary according to the circumstances faced by the consumer. Conditional value tends to satisfy temporary requirement of a user.

IV. CONCLUSION

Smart phone users tend more time using a mobile phone that any other services. This phenomenon implies the dramatically influential between humans and the mobile app. The findings help us to reveal that the conditional value has the strongest link with an app followed by functional, social and emotional values. Epistemic value is the only one that does not have a great influence on an app. Users tend to give greater important to app that are trending. The identified analysis helps developers improve existing and design new mobile apps to satisfy unfulfilled requirements of the consumer.

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Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Molecular Communication in Nano Networks

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ABSTRACT

This article examines the current research in Molecular Communication in Nano networks. Molecular Communication in Nano networks is a bio-inspired paradigm. This exchange of information is realized through transmission, propagation and reception of molecules.
A molecular communication system is defined as a system of bio-Nano machines that transmit and receive the information using chemical signals or molecules. The information exchanged between devices via molecules. There is wireless network.
Nano network is a group of interconnected Nano machines. It is also performed simple task such as data storing, computing and sensing. The molecules are transmitted as information between Nano machines. It also included the architectures of Nano network, explain the communication system and also provide the architecture of molecular communication

Keywords : Molecular Communication, Nano network

I. INTRODUCTION

Molecular Communication is part of transaction communication network. The network transaction is also a purchasing material, return and cash advance. It also transmits based on the network. The communication network refers to the information flows to the organizations. The information flows through a system, rather than being a free flow. It refers to as follow a regular pattern.

The basic part of molecular communication is using nanonetworks. The nanonetworks referred to a set of interconnected nanomachines. The nanonetwork also known as nanoscale network. It performs very simple task such as data storing, sensing etc. The nanodevice is a mechanical or electromechanical device.

The molecular communications in nanonetwork are a design, that emits the information or Datas that are divide into molecules. The sender can be sending the molecules and receiver receive the molecules. It also recognizing the small molecules such as small part of information. The sender also correctly transmitted to the receiver. Receiver correctly receive the information or data molecules. The major components of the molecular communication are

- Encoding

- Sending
- Propagation
- Receiving
- Decoding

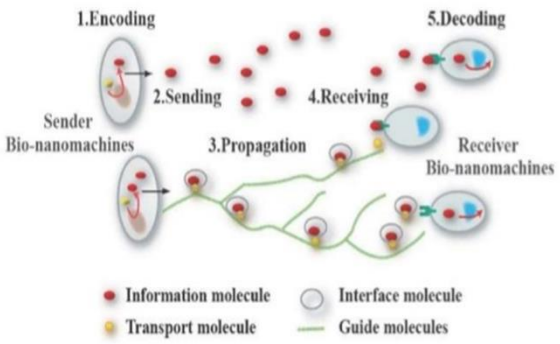
II. MOLECULAR COMMUNICATION IN NANONETWORKS

Molecular communication in a nanonetwork, it is a design strategy that a transmitter emits information molecules data that are carried to receiver. This strategy can take more favor in many mechanisms such as cells and subcellular structures that uses release of molecules for communication. The molecules can be divided into small sub molecules that can propagate from a transmitter to receivers.

Molecular Communication

The molecular Communication is also the transmission and reception of information by the way of molecules. The molecular communication techniques can be divided into type of molecule propagation in walkway-based, flow-based or diffusion-based communication.

Architecture of Molecular Communication



Encoding: -

Encoding is a state which a sender nanomachine translates information into information molecules that the receiver nanomachines can recognize. Information can be encoded in different forms within the information molecules, such as three-dimensional structure of a specific type of molecules.

Sending: -

It is a state which a sender nanomachine freeing information molecule into the environment. A sender nanomachine can be freeing information molecules by either unbinding information or data molecules from the center nanomachines.

Propagation: -

It is a state which information molecule relocate from the sender nanomachine across the medium to the receiver nanomachines.

Receiving: -

It is a state which the receiver nanomachines taking information molecules propagating in the environment.

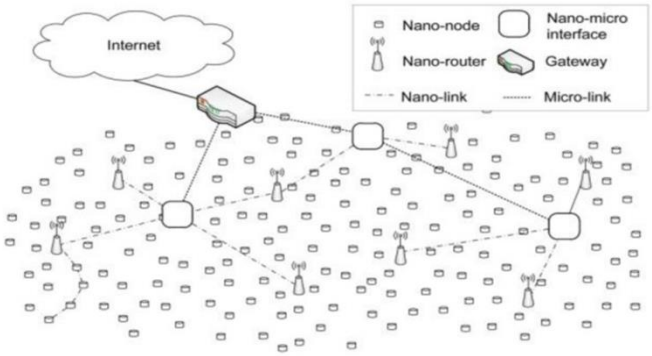
Decoding: -

It is a state which the receiver nanomachine, upon taking information molecules, decodes the received molecules into a chemical reaction.

Nanonetworks

Nanonetwork is also known as nanoscale network. It is a chain of nanomachines. It executes very easy functions such as computing, sensing, data storing etc. It can execute trivial functions by self, so communication between nanomachine is very crucial to recognize more complicated functions.

Architecture of nanonetworks



The nano-node is connected to the nano-router and the nano-router are connected to the nano-micro interface nano-micro interface is connected to the gateway. The gateway is connected to the internet. The Nano-link is used to link between nano-node to nano router and nano-router to nano-micro interface. The Micro-link is used to link between nano-micro interface to gateway and gateway to internet.

III.CONCLUSION

Molecular Communication is a novel communication pattern which uses molecules for information transmission. It is very fast method for communications in nowadays. It has minimum side effects. The nanonetworks can transmit signals in long distance. It is a less traffic method.

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Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Biometrics : New Face for Identification

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ABSTRACT

With the arrival of smartphones, social media, big data, and other technologies, our world is becoming a digital world. Since the data are computerized for better storage, accuracy, efficiency, etc... Although security is a concern for most of us. To achieve this, biometric technology was progressed. Biometrics is an automated identification or recognition technique that uses human's unique characteristics such as iris, hand, fingerprint, etc... This recognition technique seems to be more reliable. A Biometric system is highly effective for securing data. Biometrics recognition is done in two stages. They are enrollment and verification stage. It can restrict unauthorized access to personal or sensitive data. The name biometrics has come from bios means life and metrics means to measure, they are ancient Greek words. There is a range of biometric authentication technologies utilized in today's society, which are explored. Through this paper, we are discussing biometric technologies, their features, and their applications.

I. INTRODUCTION

Biometrics has progressed on the years to become a noteworthy subject once involved with pc and security. This could be classified below pattern recognition as a main discipline in engineering, primarily as a result of it involves sure aspects of pc vision, speech recognition, image process, pattern recognition, machine learning, that once combined along aids the utilization of verification and identification techniques.

The name biometrics has come from bios means life and metrics means to measure, they are ancient Greek words. Biometric is an automated recognition or identification method that uses a human's unique characteristics such as iris, fingerprint, hand, voice, etc... Both unique physiological and behavioral characteristics are used as biometric authentication. Using a biometric system, a person is recognized in the way what they are rather than what they know. Unauthorized access can be controlled in this authentication method.

A Biometric system is highly effective for securing data because of its uniqueness, universality, collectability, acceptability and permanence. Utilizing the biometric system user must be registered by capturing images using fingerprint sensor, microphone for voice recognition, camera for the face, etc... After capturing, the unique characteristics will be extracted to the database for later verification.

This registration of the user is done in the stage called the enrollment stage. And in the verification stage, where users log in by again capturing images. Then the unique features are extracted from the images to compare with the previously stored images. If there found any matches the user will be accessed. These two stages are also called modes of biometrics. Fig.1 shows the modes of biometrics.

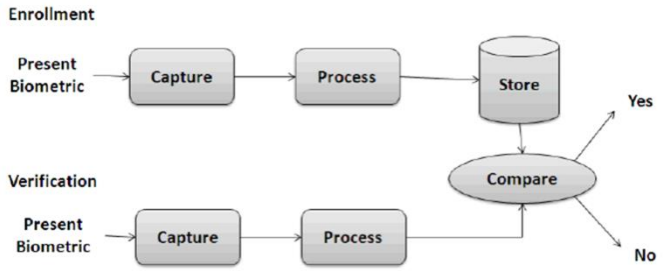

Fig.1 Modes of biometrics

II. RECOGNITION METHODS

Some of the commonly used biometric recognition systems are follows:

A. **Fingerprint Recognition:** Due to the widespread of Smartphone fingerprint authentication become most popular nowadays. Because of the user acceptance and ease of acquisition biometric are more dominant. The fingerprint is biometric technology because it is a unique feature of a human in a lifetime. On the surface of a finger there is a series of ridges and furrows that made up the fingerprint. In this method minutiae point is the features extracted for the recognition. Another common method for fingerprint recognition is pattern matching. Mainly there are four types of fingerprint readers Hardware

- Optical Reader
- Capacity Reader
- Ultrasound Reader
- Thermal Reader

B. **Iris Recognition:** Iris recognition is another developed biometric system and it is the colored portion in the eye. Like fingerprint iris is also a unique feature for each individual. Iris recognition is done by capturing images using a camera in visible light. It just takes two to three seconds to complete. As it is very expensive it can't be widely used.

C. **Facial Recognition:** Face recognition is a method of verifying individuals based on the shape, attributes such as eye, nose, chin, and relationship between them. These features can be extracted even from a photograph. 3D face recognition method is a newly emerging trend in biometric. It resolves the pitfalls of the 2D recognition system. The three-dimensional model is being developed to improve accuracy. For the acquisition of 3D images, it will require a range camera. This is one of the reasons for 3D face recognition still open research.

D. **Hands geometric Recognition:** Hands geometric recognition is based on the geometric structure and measurement of the hand. It is also unique for each individual. Unique features extracted for this recognition are the length and width of the finger's distance between the finger joint and the hand's overall bone structure. To capture images of hand geometry readers must measure hand in many dimensions. Among these, a comparison of the image is stored in the database. The images can be captured even from a low-resolution image and it just requires low data storage.

E. **Voice Recognition:** Determining who is speaking by the characteristics of his voice is the biometrics of the voice. Headphone recognition and speech recognition are not the same. Speech recognition can be used to

recognize what they said and headphone recognition can be used to recognize the speaker. Voice recognition includes both behavioral and physiological features. Just like other biometric technologies, voiceprints are also stored in a database by digitizing them. This can be difficult to check for someone with a throat problem. For them voice recognition may not be accurate.

III. APPLICATION

Biometric authentication methods have increased considerably in recent years. They are used in many fields. Mostly these authentication methods are used by law enforcement for recognizing criminals. Years passed by, biometrics had been developed and being developed for the latest trends. Some of the applications of biometrics are,

A. Justice and law enforcement
B. Airports and Border control
C. Attendance systems
D. Computer access control
E. Online banking systems
F. Telephony transactions.

IV. CONCLUSION

This article presents an introduction to biometrics and techniques, undertaking the comparative study of the biometric identifiers and also identification methods. Biometric is an automated recognition technique based on an individual's traits. Today, biometrics plays a key role in many application areas, such as forensics, military, access controls, etc. Although there are some problems with biometric systems, it is also becoming an emerging technology in the field of security.

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Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Cardiovascular Disease Prediction Using Machine Learning

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ABSTRACT

Machine Learning plays a crucial role in different areas all over the world with healthcare being one of them. Machine Learning can be used to predict various health conditions such as Cardiovascular Diseases, Locomotors Diseases, and much more. A cardiovascular Disease is a comprehensive group of diseases affecting the heart and blood vessels. Accurate prediction of these illnesses can often become difficult for doctors. Thus, Machine Learning provides a faster and accurate prediction of diseases and eases the task of doctors. Early prediction of such disease before an actual diagnosis could reduce risks and is likely to save one's life. The Healthcare industry is composed of huge piles of medical data and Machine Learning can be implemented to make effective decisions in Cardiovascular Disease prediction. Algorithms such as Naïve Bayes, decision tree, K-nearest neighbour, gradient boosting, support vector machine, and random forest are used to obtain results. The proposed system is essentially used to predict whether an individual has cardiovascular disease or not and to provide awareness or diagnosis on that.

Keywords: Machine Learning, Algorithms, Datasets, Cardiovascular Disease

I. INTRODUCTION

Machine Learning can be defined as the science that allows systems to learn and improve automatically without being explicitly programmed. It is a branch of Artificial Intelligence that plays a crucial role in the medical field. It enables computer systems to make decisions, perform, and complete tasks without human supervision or no prior explicit programming. Since, Cardiovascular Diseases have been a leading cause of death in the past few years, incorporating Machine Learning techniques into medicine could do wonders and can help save many lives to some extent.

Machine Learning predicts outcomes through a combination of mathematical optimization and statistical analysis and input data in the form of texts and images. They are composed of a variety of algorithms capable of analysis in various fields. Algorithms such as Naive

Bayes, decision tree, K-nearest neighbour, support vector gradient and random forest algorithm, gradient boosting, random forest are used to obtain outcomes. Each algorithm is used to obtain different functionalities. Appropriate algorithms are applied to different cardiovascular data sets waiting to be evaluated.

Over the past few years, the process has been evolved into using Hybrid Machine Learning Algorithm for increased accuracy in results. The modified algorithm can produce accurate results using logistic regression with principal component analysis for predicting cardiovascular disease based on various attributes such as age, blood pressure, chest pain, serum cholesterol levels, heart rate, and other necessary characteristics of the patient.

II. METHODS AND MATERIAL

As long as, cardiovascular disease will remain as one of the leading causes of death among millions, the medical diagnosis should be aided with proficient mechanisms involving computer techniques. Machine Learning creates systems that are capable of learning and make predictions based on their experience. It trains its algorithms using a training dataset to create a model. They predict outcomes by observing the hidden patterns in the new input dataset and builds a new model. The dataset undergoes keen observation and analysis, and missing values are also filled.

Machine Learning in the medical field is used to foresee the chances for an individual to suffer a heart attack or any other form of cardiovascular disease. A patient's blood pressure, type of chest pain, electrocardiogram result, etc are analyzed as the attributes contributing to disease prediction. Input data also undergoes data pre- processing to overcome issues caused by a large number of missing and noisy data.

DATA PRE-PROCESSING

It undergoes the following processes:

Cleaning

Cleaning input data usually consists of noise and missing values. To obtain accurate and efficient results missing and noisy values must be filled.

Transformation

Transformation deals with the changing of format of the data from one form to another to make it more comprehensible. It contains tasks like smoothing, normalization, and aggregation.

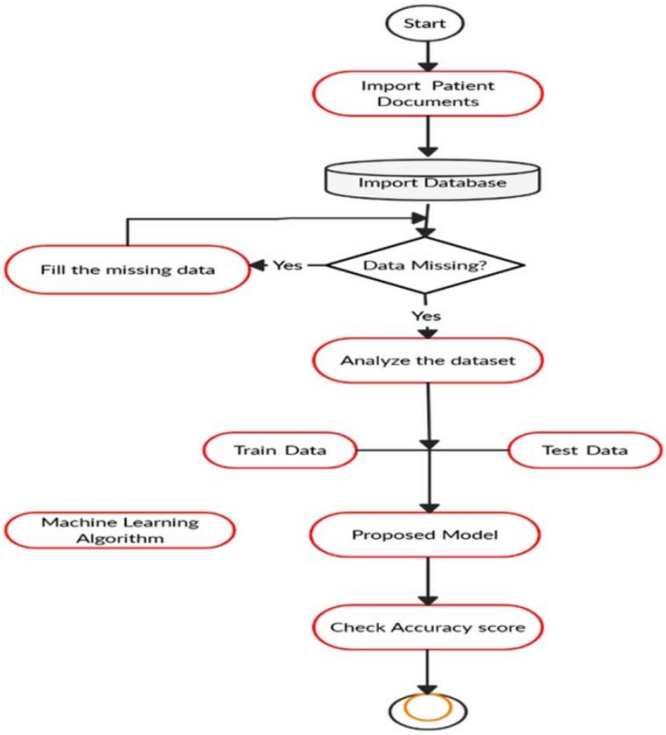
Integration

Integration is composed of the integrating of data before obtained from various sources. This is done before processing.

Reduction

The reduction is the formatting of obtained data to produce effective and accurate results.

The following is the diagrammatic representation of pre- processing of data and afterward, where data is split into training data set and test data set. They are run on different algorithms to obtain the best results:



ALGORITHMS USED

Naïve Bayes' Algorithm:

This algorithm uses the Bayes theorem for classification which is a mathematical theorem to

obtain probability. All the attributes, in this case, are independent to contribute to the probability at its maximum. It uses Naive Bayes classifiers:

$P(X/Y)=P(Y/X)\times P(X)P(Y)$, $P(X/Y)=P(Y/X)\times P(X)P(Y)$

P(X/Y) is the posterior probability, P(X) is the class prior probability, P(Y) is the predictor prior probability, P(Y/X) is the likelihood, probability of predictor.

This simple to implement algorithm holds an accuracy rate of around 84.1584% using various datasets.

Decision Tree:

Algorithm works effectively on categorical and numerical data. It can create tree like structures. It is simple and one of the widely used algorithms for handling medical dataset. It is easy to implement and analyze the data in a tree-shaped graph. It carries out analysis based on three nodes:

- Root node: It is the main node, based on which all other nodes performs functions.
- Interior node: known for handling various attributes.
- Leaf node: used to represent result of each test.

K-Nearest Neighbour (K-NN):

The algorithm classifies objects that are dependent on their nearest neighbour. It uses the Euclidean Distance calculation method for calculating the distance between two neighbours. It uses a group of named points and uses them on how to mark another point. The data are grouped based on similarities between them and thus filling missing values of data using K-NN. Various prediction techniques are applied to the dataset after the missing and noisy values are filled.

Random Forest Algorithm:

This algorithm consists of several trees which create a forest. It consists of methodologies such as Forest RI (random input choice), Forest RC (random blend), Combination of forest RI and forest RC which performs efficiently and overcomes the missing of data.

Gradient Boosting Algorithm:

It produces a prediction model in the form of an ensemble of weak prediction models, typically decision trees.

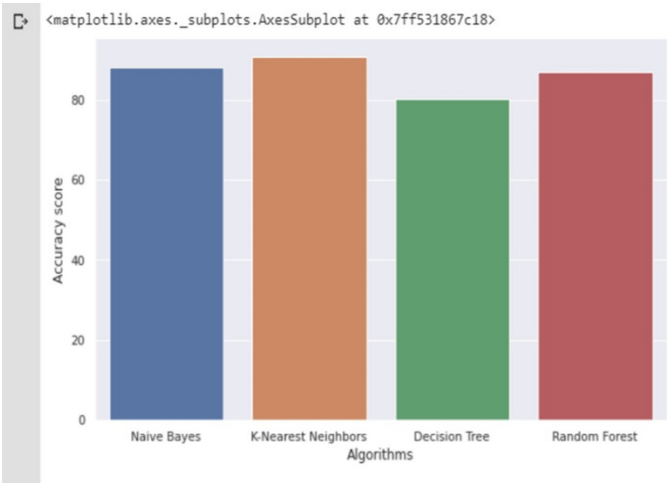
Support Vector Machine:

In this algorithm, each data point is represented as points in n-dimensional space. The goal of the SVM algorithm is to create the best line or decision boundary that can segregate n-dimensional space into classes so that we can easily put the new data point in the correct category in the future. Hyperplane can be called the best decision boundary.

III. RESULTS AND DISCUSSION

The goal is to predict the likelihood of heart disease to occur to a person before an actual diagnosis. This research provides an understanding of the incorporation of algorithms in machine learning to predict illnesses before its actual occurrence. Superficial machine learning techniques such as Naïve Bayes, decision tree, random forest, and K-nearest neighbour, Support vector machine, and gradient boosting are used to generate effective outcomes. Patient dataset undergoes proper data processing and analysis by the use of the right algorithms which are likely to process accurate results.

The following is the accuracy score obtained by applying various classification techniques in the medical field:



Even though machine learning always seemed to be obtaining accurate results, they're far from optimal. It is said so because of the rise of several methodological barriers. Some studies are reported to be hesitant on the report of complete evaluation metrics, which consists of both positive and negative cases of Beyes, bias accuracy, or analysis in the validation cohort since there are many ways to interpret the data depending on the clinical context. Despite being robust, machine learning sometimes causes such inconsistencies. Some analyses are difficult to interpret when they do not match with the clinical context, which occurs in some cases.

IV. CONCLUSION

From the study it is pretty evident that introduction of machine learning reduces the risk factor and is cost- effective, enabling millions under risk to rely on this technique. All algorithms used in this technique successfully identify chances of cardiovascular diseases without the use of major medical infrastructure equipment. Overall of approach machine learning in this field was successful in generating reliable results and came off as a promising resource. Algorithms such as gradient boosting and support vector machine are well known for their production of highly accurate result sets. Machine learning is capable of overcoming all limitations through further implementation of complex techniques.

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Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

A Study on Detection and Prevention on Infectious Disease Using Data Mining

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ABSTRACT

Data mining technology plays an imperative role in the field of biomedical sector and they turned into the subfield of medical research. This paper present a survey of data mining techniques utilized for the detection and mitigation of communicable disease like cold, flu, hepatitis, and so on. Communicable disease that is pass on from infected individuals or via animal, vector or the inanimate environment to a susceptiple animal or human host. The health related information are put away in large database that scattered through different hospitals, clinics and research centers. Using data mining and its implementation, Health organizations can transform the data of the large database in to a powerful and competitive tool and take new steps in preventing, diagnosing, treating, predicting cause and providing high quality services. Many of data mining techniques is used in health sector, classification is provided with the predictive data set, which contains similar attributes but with different data values, Then it analyze the given data and produce prediction by placing the different data sets in different classes based on the relationship of attributes, The performance of the system is evaluated in terms of different parameter like rules used, classification accuracy, and classification error.

Keywords: Infectious disease, Data mining, Classification

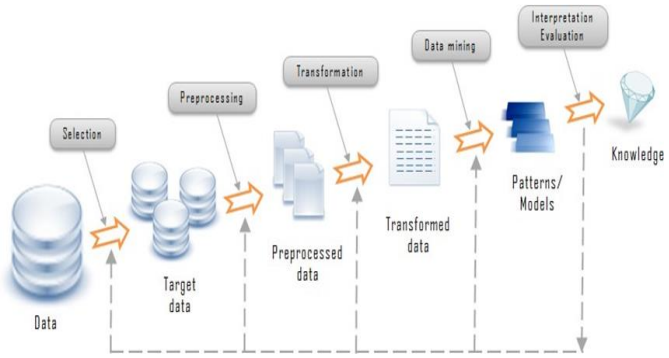
I. INTRODUCTION

Data mining techniques plays an inevitable role in Healthcare. Infectious diseases are disorder caused by organisms, such as bacteria, virus, fungi, etc. Many organisms live in our body, they are normally harmless or even helpful. But under certain condition, some organism may cause disease. The communicable disease that can be spread through the direct contact with person to person, animal to animal, animal to person, and so on, contaminated foods or water is also cause to infection. Much infectious disease can be counteracted by taking vaccines. Data mining is a collection of large set of data and processed it and gives useful information such as clustering, classification, decision tree etc. that helpful for decision making. In healthcare, to give the set of medical data that can be stored in a database, when a doctor or patient or a medical representatives can request to get specific information, to applying data

mining technique, extracting the large database and return the best knowledge based on the request. Data mining technique provides an important means for extracting valuable medical rules hidden in medical data and acts as an important role in clinical diagnosis. Sometimes people ignore some medical symptoms or conditions that they might be suffering from and do not feel like going to the doctor for every small medical problem that they are facing. Hence, we felt that there is a need for a medical health advisor that would guide people about the diseases or medical conditions that they might be suffering from.

This medical health advisor is an intelligent learning and heuristics based system that predicts the diseases based on the symptoms that they enter. Based on this prediction the application would also suggest if they need to take medical advice from a doctor for their condition and if yes what kind of medical specialist do they need to visit. This application would also be useful for medical professionals and new medical students if they need to know about all the possible diseases that might be related to one particular symptom. Thus, particularly in the Indian context where medical advice is not readily available especially in rural areas, tie-ups could be done with local health centers and the state government in extending this application's reach. Medical ignorance could be life-threatening thus it is important to stay informed to stay safe.

Data mining is used as a part of the knowledge discovery in database (KDD) process. In this process extracting of data can be done by following number of steps that is data selection, preprocessing, transformation, datamining and data interpretation or evaluation. The use of datamining in healthcare, we can quickly find out the emerging infectious disease and identifying the patient having high risk condition can receive more affordable treatment.



II. DATA MINING TECHNIQUES

Data mining is mining knowledge from data. Data mining technique provides an important means for extracting valuable medical rules hidden in medical data and acts as an important role in clinical diagnosis.

A. Classification

Classification is the process of extracting or predicting information based on the given data. It is provide with the predictive data set which include similar behaviours but with different data values. Then find given data and originating the prediction by placing the different data set based on the relationship of attributes.

B. Decision Tree

The decision tree is a data mining tool which plays a vital role in knowledge discovery. It extracts meaningful hidden information. The large data set can also be processed to obtain new target patterns.

Decision tree finds its application in various domains such as machine learning, information extraction, bio-medical applications and scientific research for classification. The description of J48 decision trees can be found in. New dataset records can be formed by applying a decision tree like J48.

It is seen that accuracy rate has improved to 76.67% similarly attributes can be removed in order to achieve better results. On repeated removal of

attribute study achieves 85%. Consolidate the attributes based on their accuracy achieved.

C. Support Vector Machines

Vladimir Vapnik first introduced idea of Support Vector Machine [5]. Its accuracy is better than all other available techniques. It was first introduced for binary classification problems; but it can be further extended to multi class problems. It creates hyper-planes to separate data points. It can be implemented in 2 ways:

1. Mathematical programming
2. Using kernel functions

With the help of training data sets, non- linear functions can be easily mapped to high dimensional space. This can only be possible using kernel functions like Gaussian, sigmoid etc.

D. Artificial Neural Networks

Neural networks help in mining data in various sectors such as banking, retail, and bioinformatics. Finding information that is hidden in the data is challenging but at the same time, necessary. Data warehousing organizations can use neural networks to harvest information from data sets. In Neural Networks, basic elements are neurons or nodes. These neurons are interconnected and within the network they worked together in parallel in order to produce the output functions. From existing observations, they are capable to produce new observations even in those situations where some neurons or nodes within the network fails or go down due to their capability of working in parallel. An activation number is associated to each neuron and a weight is assigned to each edge within a neural network. In order to perform the tasks of classification and pattern recognition neural network is mainly used.

III.CONCLUSION

A comparative analysis of data mining applications in the healthcare sector by various specialists has given in detail. Primarily data mining tools are used to predict the results from the information recorded on healthcare problems. Various data mining tools are utilized to predict the precision level in different healthcare problems. In the given list of medical problems have been examined and evaluated. Data mining is the widely used techniques for mining the essential information from large medical dataset.

This technique can be used for both communicable and non-communicable disease detection and prevention. In the study of data mining techniques and its application in health sector for early prediction and diagnosis of communicable disease.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Sentiment Analysis and Applications – A Review

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ABSTRACT

Sentiment Analysis is considered as a section of opinion mining. Its objective is to extract the emotions and attitude of people about a particular topic from a structured, semi-structured or unstructured data. From a bit of text, sentiment analysis can govern the writer's attitude towards a specific topic i.e. neutral negative or positive. It has a vast range of implementation because opinions are primary to almost all human activities and are key influencers of human habits. Truly concentrate to a customer's voice requires deeply recognizing what they have conveyed in natural language. NLP is the best way to reveal the sentiment behind it. A sentiment analyzer for analyzing text make use of machine learning also use natural language processing techniques (NLP) .Sentiment analysis is frequently carried out on textual data to help businesses and sentiment about a product helps in customer feedback analysis and understanding customer needs. This paper presents the review on sentiment analysis to identify the concept and its application areas. This will be helpful to get a clear knowledge for students and researchers who have deep interest in this topic.

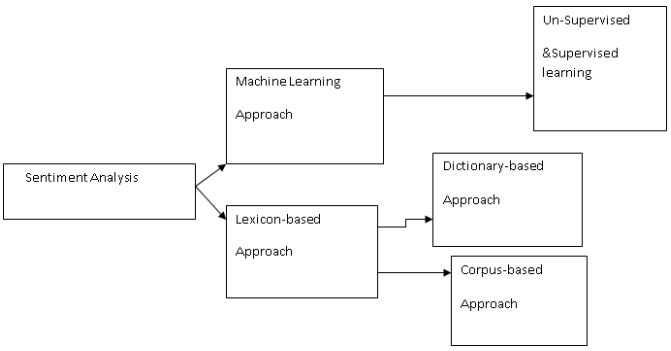
Keywords: Opinion Mining, structured, Natural Language Processing, Machine Learning.

I. INTRODUCTION

Time equals to money or even more precious than money .As enormous amount of time is wasted for reading and to get the attitude of the text from reviews, sentiment analysis can be used instead ,which automates the objective, and perform the same more efficiently in lesser time. Sentiment analysis is one of the most keen research zones for prediction and also used for classification. While product and services are analyzed by customers and critics .Automated sentiment analysis of text issued. Business considers sentiment analysis more important to draw a general opinion about their product and services. When we consider a movie for sentiment analysis it helps concerned organization to find the opinion of people about movie from the reviews .To detect whether it is neutral, negative or positive .One can in-turn make a general judgment about a movie. The aim is to calculate or find the polarity of sentences that we take out from the people reviews. We will represent sentiment from movie review and try to discover how this sentiment works well for this movie.

Generally we can demonstrate the working of sentiment Analysis in five steps the very first step is Tokenization- it is the process of dividing the statement into different set of words. The second Step is cleaning the data - it is the process of removing the special characters from the statement. The third Step is removing the stop words - it is the process of removing all the stop words like was, the, she, it from the statement. Classification is the process of assigning sentimental score to the words. -1 sentiment score for a negative, +1 sentiment score for a positive and 0 for a neutral polarity. Classification is the fourth step. At last the final step is applying supervised algorithms for classification. Sentiment analysis is considered as a flourishing section of NLP i.e. natural language Processing.

II. METHODS AND MATERIALS



[5]Sentiment classification techniques

Sentiment Analysis also known as opinion mining it plays an important role in decision making. Organizations make use of these techniques. For better decision making the proper techniques must be used to get high accuracy results. **Machine learning** is a part of artificial intelligence (AI) that provides computers with the capability to learn without explicitly programmed. Machine learning aims at the development of computer programmers that can guide themselves to expand and change when reveals to new data. The process of data mining and machine learning is almost similar. Machine learning is categorized into supervised learning and un-supervised learning.

Supervised learning:-If a model is capable of predicting with the help of labeled dataset that is termed as supervised learning and here we are training with the help of features and labels.

Unsupervised Learning:-In the case of unsupervised learning we are training the machine without labels so the machine itself categories the dataset by observing the features of the data inputted. We can divide un-supervised learning into four parts they are Decision tree, linear, rule based and probabilistic classifiers which include the common algorithms used in sentiment analysis. Naïve bayes, Bayesian network and Maximum Entropy are the sub-areas of probabilistic classifier which is a part of un-supervised learning. Support vector machine (SVM) and neural networks which is the most emerging techniques comes under linear classifier.

Lexicon-based approach does not need prior training it uses some set of words that is established in advance and each word is associated with a specific sentiment. The corpus and Dictionary based approaches are the sub-areas of lexicon approach.

Corpus bases approach:-Corpus based approach is based on actual usage, real and authentic appearance of language as it is pronounced and written Semantic and statistical are the sub areas of corpus based approach.

Dictionary based approach:-It is a computational approach.

While thinking about the techniques of sentiment analysis the most basic techniques is machine learning and lexicon.

Hybrid approach is one of the techniques used in sentiment analysis which is the combination of these two approaches. But hybrid approach is less used when compare to both of these.

While making use of these sentiment classification techniques one can implement sentiment analysis in current market. Not only a single application the

applications of sentiment analysis increasing day by day with the advancement in the features of sentiment analysis. There are different applications of sentiment analysis in the current world and will surely increase in the number in the coming years.

III. APPLICATIONS

Sentiment analysis has so many applications but the most common and familiar application is product review and movie review.

A. Product Review

Many customers use online platforms for purchasing. But the customers need to know the review of the product to check whether the product is good or not. The reviews of products from other people who have already purchased the product and used were checked to ensure that the product is a good one. Also not only for a customer the company also can analyze whether there product is performing good in the market or not. Taking review from each and every customer manually will not work because the task is time consuming. By making using of sentiment analysis in reviewing a product the company can make modifications in the product according to customers need.

B. Movie Review

Sentiment analysis can be used in movie review to analyze the success of the movie from the review of the viewers. By making use of this we can analyze the performance of actor, actress, director etc. of movie. Instead of wasting the time and money for a flop movie people can analyze the review and choose the hit movie. Also this analysis will help movie makers to find the probability of their upcoming movie to be a hit or flop.

IV. CONCLUSION

Sentiment analysis is most widely used technique which analyzes sentiment and now it is one of the emerging fields. With the advancement in natural language processing and machine learning the organizations get deepest information's about their customers. This paper examined the sentiment analysis techniques and the applications of sentiment analysis. In future, we want to apply SVM classifier for extracting sentiment polarity from the text.

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A Comparative Study of Different Machine Learning Models for COVID-19 Prediction in India

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ABSTRACT

Machine Learning (ML) can be deployed very effectively to track the disease, predict the growth of the epidemic and design strategies and policies to manage its spread. Several prediction models for COVID-19 are being used by officials to make relevant control measures. Due to a high level of uncertainty and lack of essential data, standard models have shown low accuracy for long-term prediction .In several technology domains, ML models have been used to define and prioritize adverse threat variables. This study applies an improved mathematical model to analyse and predict the amount of forthcoming COVID-19-affected patients in India. An ML-based improved model has been used to predict the threats of COVID-19 in India. . In this paper, we have performed a comparative study of four machine learning standard models like linear regression (LR), decision tree, multi-layer perception (MLP) and random forest to predict the threatening variables of COVID-19. The prediction models such as Decision tree, MLP and Random forest are evaluated on the basis of loss functions such as R2 score.

Keywords : Machine Learning, Linear regression, Multi-layer perception (MLP)

I. INTRODUCTION

The COVID-19 pandemic in India is part of the worldwide pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2.Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. The novel Coronavirus disease (COVID-19) has been reported to infect more than 2 million people, with more than 132,000 confirmed deaths worldwide. The recent global COVID-19 pandemic has exhibited a nonlinear and sophisticated nature [2]. In addition, the outbreak has differences with other recent outbreaks, which brings into question the ability of standard models to deliver accurate results. The cumulative incidence of COVID-19 is rapidly increasing day by day. Machine Learning Machine learning provides a lot of support in identifying the disease with the help of image and textual data. Machine learning are often used for the identification of novel coronavirus. It can also forecast the nature of the virus across the globe. However, machine learning requires a huge amount of data for classifying or predicting diseases. Supervised machine learning algorithms need annotated data for classifying the text or image into different categories. Recent pandemic

has attracted many researchers around the globe to solve this problem.

This study applies an improved mathematical model to analyse and predict the expansion of the epidemic. An ML-based improved model has been applied to predict the potential threat of COVID-19 in countries worldwide. We tried to construct a meaningful machine learning model that is capable of performing predictions when fed with the dataset provided by the WHO to check the impact of the same and tried to perform basic analytic and visual operations to seek more a clear picture of the pandemic.

II. LITERATURE REVIEW

In this section, we tend to discuss concerning the opposite coincident researches associated with the COVID-19 international occurrence and its scientific applications. Scientists and practitioners everywhere the globe have pursued experimentation's on the worldwide real time COVID19 knowledge and have discovered valuable insights, patterns and information from the information. From the paper revealed in Journal of thoriac unwellness (2020), the authors showed however varied government policies to regulate COVID-19 affected the numbers. The authors have used the foremost updated COVID-19 knowledge with Associate in nursing merger of the amount of individuals migrating before and once Gregorian calendar month 23rd2020.The dataset was extracted from native and national government sites and therefore the UN agency web site. The modelling and approach was a four-step process:

(i) identification and process of COVID-19 data;
(ii) applied math model estimation for population death rates as a operate of your time since the death rate exceeds a threshold in a very location;
(iii) predicting time to exceed a given population death threshold in states early within the pandemic; and
(iv) Modeling health service utilization as an operate of deaths.

III. DATASET AND PREPROCESSING

The authentic datasets of COVID-19 have been gathered from https://www.mygov.in/ , the dataset is publicly available on cases from India from the first case index on January 30 2020. The datasets gathered were in a monthly format from January 2020 to February 2021. Table 1 displays the scenario of COVID-19 incidents in India from January 2020 to February 2021. As at February 2021COVID-19 dataset includes accumulated 15,075,501 total samples, confirmed cases of 11,063,491, 156,825 death cases.

IV. COMPARATIVE STUDY OF ALGORITHMS

For solving this particular regression problem, we have taken into consideration the following three algorithms:

- Linear regression (LR),
- Decision tree
- Multi-layer perception (MLP)
- Random forest

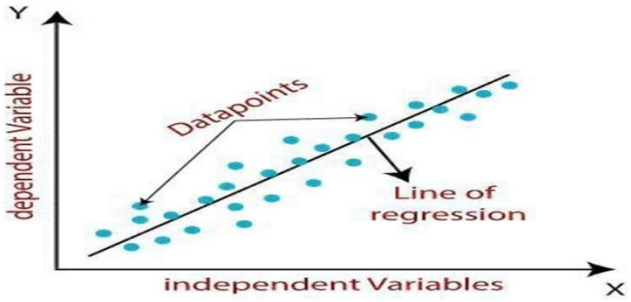
These algorithms would be explained in the section below.

A. Linear Regression

Linear regression algorithm shows a linear relationship between a dependent (y) and one or more independent (y) variables, hence called as linear regression. Linear regression algorithm shows a linear relationship between a dependent (y) and one or more independent (y) variables, hence called as linear regression. Since rectilinear regression shows the linear relationship, which suggests it finds how the worth of the variable is

changing consistent with the worth of the experimental variable. The rectilinear regression model provides a sloped line representing the connection between the variables.

The linear regression model provides a sloped straight line representing the relationship between the variables. Consider the below image.



Mathematically, we can represent a linear regression as:

y= a0+a1x+ ε

Here,

y= Dependent Variable (Target Variable)

x= Independent Variable (predictor Variable)

a0= intercept of the road

a1 = Linear regression coefficient

ε = random error

The values for x and y variables are training datasets for Linear Regression model representation.

B. Decision Tree

Decision tree falls under the category of supervised machine learning algorithm. It can be used for both continuous as well as categorical output variables. It uses a decision-making flowchart like tree structure to make decisions. The branches/edges usually represent the results of the node and therefore the nodes have either:

- Conditions (Decision Nodes)
- Results (End Nodes)

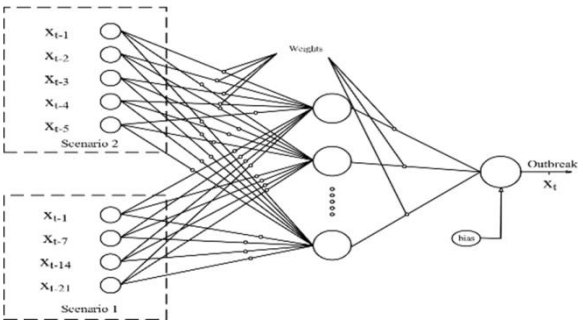
Decision tree regression observes features of an object and trains a model within the structure of a tree to predict data in the future to form meaningful continuous output. Output that is not discrete is known as continuous output, i.e., it is not represented just a discrete set of numbers or values [7].

C. Multi-layered perceptron (MLP)

ANN is a thought inspired by the biological system a nervosum, which processes information just like the brain. The key element of this concept is that the new structure of the knowledge processing system [76-78]. The neural network is about up during a learning process to perform specific tasks, like identifying patterns and categorizing information.

In the present research, one among the frequently used sorts of ANN called the MLP [76] was employed to predict the outbreak. MLP was trained using a dataset. For the training of the network, 8, 12, and 16 inner neurons were tried to realize the simplest response. Results were evaluated by R*R and correlation coefficient to reduce the cost function value.

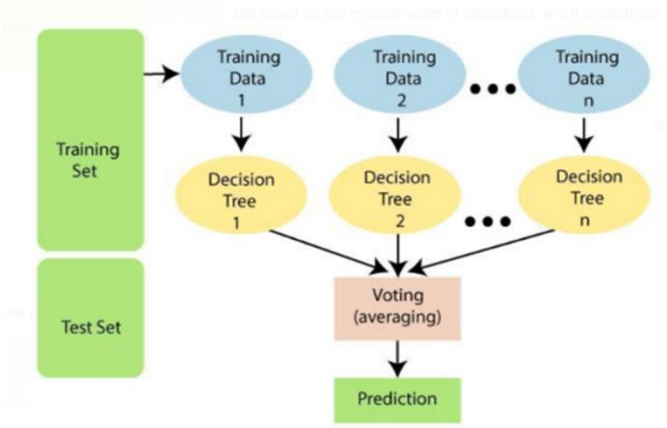
Figure 5 presents the architecture of the MLP.



D. Random Forest

Random Forest may be a popular machine learning algorithm that belongs to the supervised learning technique. It is often used for both Classification and Regression problems in ML. It is supported the concept of ensemble learning, which may be a process of mixing multiple classifiers to unravel a posh problem and to enhance the performance of the model. "Random Forest may be a classifier that contains variety of decision trees on various subsets of the given dataset and takes the typical to enhance the predictive accuracy of that dataset."

Rather than counting on one decision tree, the random forest takes the prediction from each tree and supported the bulk votes of predictions, and it predicts the final output. The greater number of trees in the forest leads to higher accuracy and prevents the problem of over fitting. The below diagram explains the working of the Random Forest algorithm:

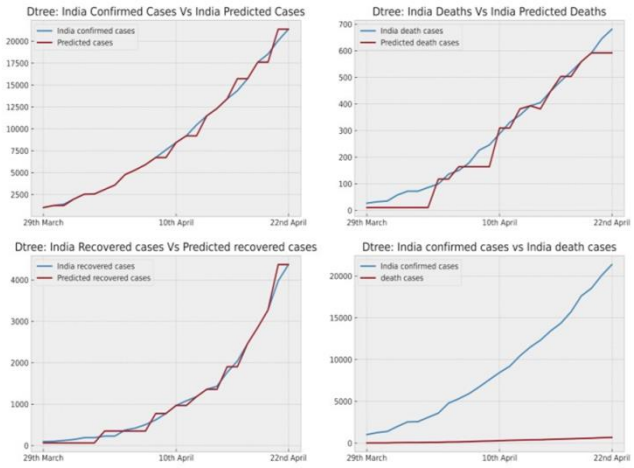


V. EXPERIMENTAL ANALYSIS

In this research, we have used MLP, Random forest and Decision tree Regressor from Python's sklearn library. The country selected for 'International COVID19 Spread Analysis' is India. All the confirmed cases, confirmed deaths, confirmed recovered cases have been analysed, compared and ran through the prediction methods for the Country.

The International COVID19 Spread comparison and analysis for India using decision tree algorithms have been shown below:

Prediction and Analysis for India Using Decision Tree:



Prediction and Analysis for India Using Decision Tree

VI. RESULTS & EVALUATION

The developed model was tested based on r2 score, which is imported using sklearn library's metrics package. The equation of r2 score is shown below:

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Where

r = the correlation coefficient

n = number in the given dataset

x = first variable in the context

y = second variable

The Table shows the r2 score observations made when the model was executed on India's dataset:

Algorithm used and R2 Score for India's dataset

Algorithm	R2 Score
MLP	0.9988
Random Forest	0.9947
Decision Tree	-0.8215

The table clearly shows that the performance of the model is the best when the algorithm used is MLP, and its r2 score is 0.9988.

VII. CONCLUSION

In this paper, we had done the comparative study of different machine learning models for Covid 19 prediction with the collected dataset . Most popular ML models were used and was to able to achieve good result with the help of MLP. The scope of this research can be expanded by adding more country and state-level data for increasing the efficiency of this comparative study. The algorithms used for this study can be evaluated on more than one performance metric which can be mean square error (MSE), variance etc.

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Role of Socio-Informatics Participation in the COVID-19 Study: Highlighting Healthcare Arenas to Benefit from Information and Communication Technology

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ABSTRACT

The coronavirus 2019 (COVID-19) epidemic has had a profound impact on human health and well-being. Biomedical informatics is important in the efforts of the COVID-19 study and the delivery of health care to COVID-19 patients. Central to this effort is the participation of students who are actively engaged in other scientific or clinical issues. The purpose of this study is to highlight specific examples of COVID-19 research spots that can benefit from information technology. We present here two related approaches focusing informatics applications health care concealment. The first focuses on the use of Smart devices and related technologies on educating and monitoring, and the second focuses on the use of sensors in the domain. Few tools have been used to monitor patients and the community found to be helpful in creating information that provides acumen into the dominance of sickness and fitness needs. Digital tools have the power to connect people and to form active support groups. There exists need for tools that can include video conferencing, seamless communication, and more sophisticated functionalities such as virtual reality and augmented reality, designed for diverse audiences with the aim of promoting social interaction meanwhile maintaining physical distances. Modelling COVID-19 cases accumulated daily in regional variations illuminate the comparative effectiveness of different policy decisions and may point to countries like India, through policies that have succeeded in reducing the spread of epidemic. Rather than proposing any solid findings, it is our hope that this slice drives to inspire and make it easier for other gurus to embrace the COVID-19 research projects leveraging socio informatics on the base.

Keywords : COVID-19, Epidemic, ICT, Informatics, New-Media, Sensors, Smart-Devices

I. INTRODUCTION

The coronavirus 2019 (COVID-19) epidemic has had a profound impact on human health and well-being. Research efforts are underway to identify vaccines [1], to improve testing [2, 3], to understand transmission [4], to improve serologic testing [5], to improve treatment methods [6], to predict risk [7], and to

develop strategies for mitigation and prevention [8, 9]. Biomedical science is central to all of these research efforts and to the delivery of health care to COVID-19 patients. Central to this effort is the participation of students who are actively engaged in other scientific or clinical issues. The purpose of this plan is to highlight specific examples of COVID-19 research sites that can benefit from informatics technology. Each research concept summarizes the application area of the COVID-19 followed by a methodology, method, or technology that can make a contribution. This is followed by some practical suggestions for getting started. These are organized under Consumer Health Informatics studies focusing on the use of mobile devices and telemedicine, as well as Public Health informatics focusing on research questions at the human or community level. We sincerely hope that this section will inspire and make it easier for other educators to embrace the COVID-19 research projects.

Our study focuses on the use of Smartphones and other technologies to educate the public about epidemics and how to prevent infection and monitoring, and also on the usage of sensors in the domain.

II. PATIENT EDUCATION PREPARATION AND TOLERANCE

Consumer health information, which focuses on tools and programs that include and empower patients and general health consumers in health delivery and decision-making processes, plays a major role in the epidemic context. Some areas that consumers of consumer informatics and programmers can look at include consumer education, independence, monitoring, and community involvement. At a time when ethical guidelines are being continually updated with new information, consumer education is critical to transmitting and disseminating possible and timely information. Tolerant sites and other websites may provide educational content that can be used in accordance with the needs of individual knowledge as well as literacy and health standards. In addition, systems can incorporate interactive features that can help support decisions and analyze them. One such example is the patient self-report and planning platform developed at the University of California San Francisco to empower underprivileged patients to report exposure and patients with symptoms to be evaluated and linked to appropriate levels of care [10]. The system is already widely used and performed with high sensitivity in recommending emergency care to patients with the disease. It also prevents unnecessary visits. The tools that have been traditionally used to monitor patients at home and in the community can also be helpful in creating information that provides insight into the prevalence of disease and health needs. An example is that of a smart thermometer vendor that has developed an app that allows users to record their temperature and other signals through a platform that complies with the Health Insurance Portability and Accountability Act (HIPAA); the data is compiled and shows how the virus travels from one village to another, providing a detailed view map highlighting areas with an unusually high fever rate.

Other mobile health tools that track aspects of daily life including activity levels, sleep quality, or symptom self-regulation can make it easier to monitor better health and well-being and can lead to effective symptom management at each level, and contribute to quality control. Examples include activity tracker data that informs the observation of social distance patterns, and home spirometer data and oximetry data that can cause signal progression in various societies. Finally, in times of "social isolation", vulnerable people such as elderly adults living alone are at greater risk of further social isolation, often referred to as the silent epidemic and greater health risk [11]. Digital tools have the power to connect people themselves to the delivery of social services, and to

form active support groups for peer-to-peer and connected communities including friends and family members. The current epidemic has highlighted the need for available and secure tools that can include video conferencing, harmonious and seamless communication, and more sophisticated features such as virtual reality and augmented reality, designed for diverse audiences with the aim of promoting social interaction during physical distances.

III. SMART DEVICES AND SENSORS

Smartphones and other smart wearable devices contain sensory-level sensors that can illuminate at least a subset of COVID-19 symptoms including fever, fatigue, dry cough and shortness of breath. For example, the temperature recorded by the fingerprint sensor, now standardized in most modern smartphones, was previously used to effectively predict the flu [12]. In addition, functional sensors such as the accelerometer have been used to detect fatigue. While high-resolution computed tomography (CT) imaging of a patient's lungs can provide a more reliable indication of infection, the higher costs and lower costs make this method less likely to work more widely at the general level. On the other hand, Smartphones are currently widely distributed even in low- and middle-income countries and their high-quality sensory data can be used at no cost to measure a subset of COVID-19 key signals as a testing tool to identify people who may need further testing or testing.

IV. COVID-19 MONITORING INFORMATION SYSTEMS

The critical need for any strategy facing COVID-19 is to monitor adequate disease. In the case of crime and death, several international efforts have been made to maintain and validate the census, including investigators at Johns Hopkins University (https://coronavirus.jhu.edu/map.html) and journalists in New York Times (https://www.nytimes.com/ interactive / 2020 / world / coronavirus-maps.html).

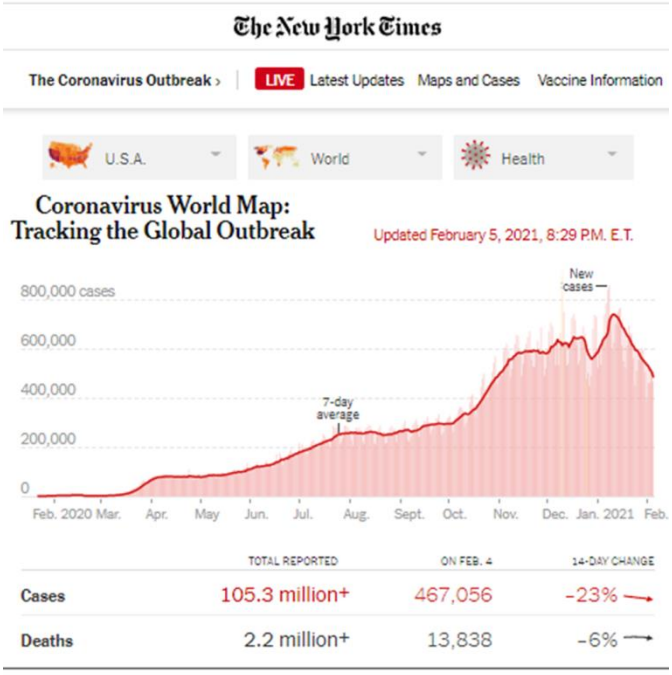

Fig.1 NYT Model for Corona Virus tracking

These and other efforts are based on reports from a variety of sources, many of which handle and store data separately, requiring experts to process and process data effectively. Crime and mortality statistics are helpful and widely used by health care systems, policy makers, government institutions and the general public. However, they are known to discriminate given the different availability and use of laboratory tests to determine the status of the COVID-19 case in different areas.

Extensive efforts to track the true impact of COVID-19 require that appropriate SARS-CoV-2 testing be appropriate. Knowing who is infected regardless of the symptoms or condition of the disease has effectively prevented further transmission, appropriate identification of risk factors leading to various symptoms, and adequate adjustment of health plans for treating patients who carry them while minimizing risk to uninfected providers and patients. The development and distribution of population tests should be the main goal for the successful acquisition

of COVID-19. In conjunction with applications developed by informaticists, contact tracking and case classification can continue to effectively control outbreaks [8]. Such efforts are thought to reduce the spread of COVID-19 in Singapore and South Korea. Because it is not possible in countries like the U.S., that national or local governments, or many citizens can use contact tracking without ensuring that each level data is protected, various educators are involved in efforts to create privacy to keep tracking applications.

Though nothing can replace a laboratory-based virus test that is suitable to understand disease transmission, but informatics solutions help to adequately overcome test failure. In the U.S., Canada, and Mexico, COVID near You (fig 1) is a public participation forum where anyone can donate their current state of health in relation to COVID-19 symptoms and test results.

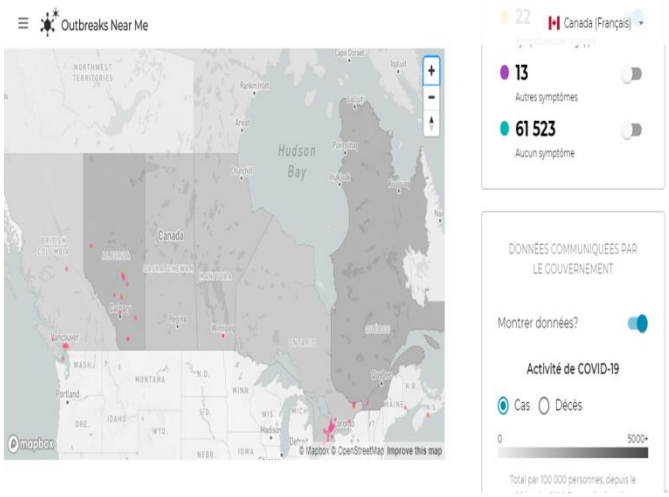

Fig.1 OutbreaksNearMe.org Public Participation Forum

The compilation of this individual-level data is used to track the quality of human life in real time. Other data that can be used to fill surveillance spaces include search engine data (e.g., Google queries for COVID-19-related terms), and less, contact data (e.g., COVID-19-related Twitter posts). Informaticists lead and contribute to these efforts around the world.

V. DATA VIEWING SYSTEMS AND COVID-19 RAPID SPREAD ANALYSIS SYSTEMS

The spread of infectious diseases such as COVID-19 provides a unique opportunity to assess regional prevalence and disease progression at the human level. The variability in the pathogenic strains of the various diseases facing the previous epidemic means that the spread of COVID-19 may not be completely predictable depending on the levels of view of the history of disease transmission. Details on the aggregate number of COVID-19 cases are available at national / regional / city levels and by studying the continuing spread of disease in the affected regions nearing the time of the first outbreak, effective identification of infection rates can be made in later affected areas. For example, by modeling COVID-19 cases accumulated daily in regions, regional variations in trends may illuminate the comparative effectiveness of different policy decisions and may point to countries and policies that have succeeded in reducing the spread of COVID-19, providing evidence of adoption of active public health policies epidemic. Introducing this information to the public using data recognition methods in an important informatics function.

VI. REAL-TIME MONITORING VIA SOCIAL MEDIA

The total number of social media users continues to grow worldwide, which has led to the creation of more data.(fig 3) Social networking sites such as Facebook, Twitter, and Instagram dominate the industry. About 500 million tweets and 4.3 billion Facebook messages are sent daily

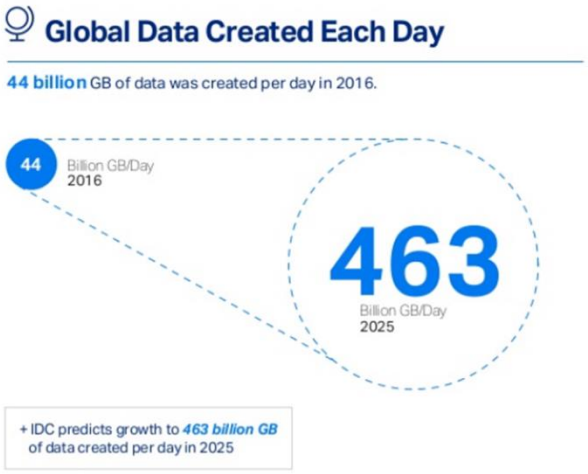

Fig 3. Growth of Internet Data: Info graphic by Micro Focus Inc.

The Pew Research Report (http://www.pewinternet.org/fact-sheet/social-media/) states that about half of all adults worldwide and two-thirds of all American adults (65%) use social media. The report states that for all users, 26% discussed health information, and, of those, 30% changed behavior based on this information and 42% discussed current health conditions.(fig 4) Advances in automated data processing, machine learning, and NLP suggest that this large data source may be used in health and community applications, if researchers face unique challenges in these media.

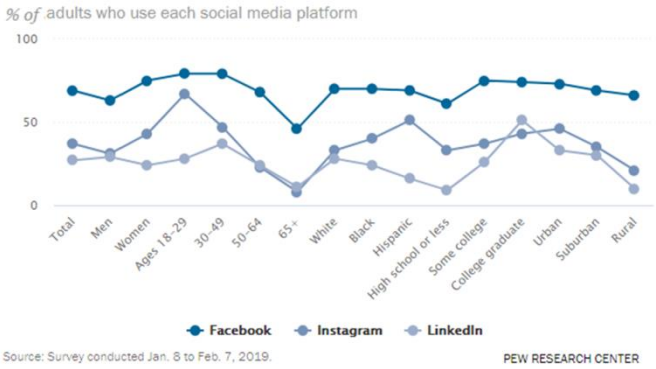

Fig 4. Social Media Usage graph by Pew Research

When events such as the COVID-19 epidemic sweep through the world, the public turns to social media. While there is a general belief that much content is useless, adequate collection, filtering and analysis can produce useful information for assessing public feelings. In addition, given the delays and shortcomings of testing available in the United States, social media can provide real-time monitoring capabilities like Penn COVID-19 Twitter map analysis (fig 5 below), which provides insight into real-world responsibility. of diseases. The initial function of this method is updated. A stored type of paper, with training data and annotation guidelines as additional items, is available [13].

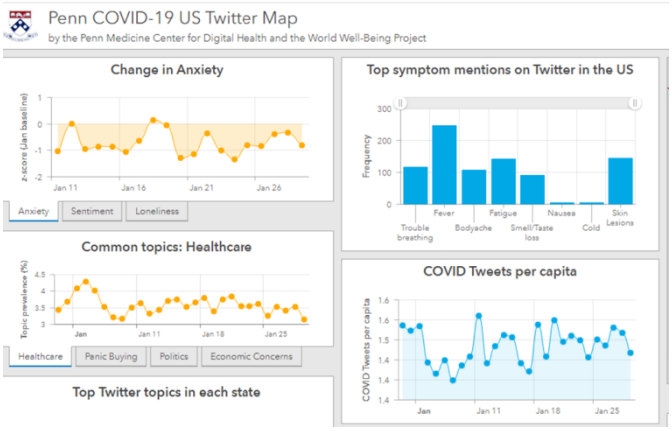

Fig 5. Penn COVID-19 Twitter map analysis

While research into the discovery of social media applications for health applications is still in its infancy, the domain has seen an increase in interest in recent years. Many studies have been published later in the regime, including pharmacovigilance research [13], identification of user behavior [14], identification of user-experience social gatherings (such as drug abuse), monitoring of misconduct [15], and tracking infectious disease / viral spread [16, 17]. Personal and public health topics are heavily addressed, although various social networks may be suitable for specific targeted activities. For example, while Twitter data has been used for content monitoring and analysis, a large portion of research using Facebook has focused on communication rather than language-related content analysis [18, 19]. In health research and surveillance studies from social media, the most common topic has been flu surveillance [20, 21]. From the perspective of informatics and NLP, the proposed strategies are based on data collection areas (e.g., keywords and

queries) [22, 23], text classification [24, 25], and data extraction. As new approaches are proposed, there is still a lot of progress to be made in this area.

The effective use of health-related information contained in social media will require the concerted effort of the research community, and gather researchers from a variety of disciplines including NLP, machine learning, data science, biomedical informatics, medicine, pharmacology and public health. Information gaps between researchers in these communities need to be narrowed down by public sharing of information and the development of practical novel programs.

VII. CONCLUSION

The COVID-19 epidemic presents a host of challenges and research opportunities in almost all scientific disciplines include biomedical informatics. From molecular and genetic sciences to human health, researchers in all fields of informatics stand to play a major role in addressing these challenges. Data Technologists and Information scientists can effectively contribute abundantly. Hopefully, with the many research examples we have considered in this paper, informatics researchers and practitioners can see potential ways in their works. There is no shortage of COVID-19-related opportunities for those working in informatics and it is our hope that experts will vigorously explore this as it emerges. In addition, we hope that non-academics should be appreciating the contributions that informatics researchers can make to their fields as we all want to address the COVID-19 epidemic and its effects around the world, thereby contributing our intellectual part in fighting against the pandemic, ultimately creating certain active forums of socio informatics, to serve the global society.

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Role of Socio-Informatics participation in the COVID-19 study: highlighting Healthcare arenas to benefit from Information and Communication Technology.

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National Conference on Trends & Technologies in Multi-Disciplinary Research
Organized by A2Z Edu-LearningHub and
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 3 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Corona Virus and Its Impact on Various Industrial Sectors

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ABSTRACT
The outburst of COVID-19 is the major incident that happened in 2020, till yet. It already impacted 12.5 million in the world and still going strong. The COVID-19 surge as a pandemic and affected millions of lives, along with the business operations in the global market. Considering the current market conditions, the virus is rapidly impacting the consumption and supply chain for the companies in the market. It will around and creates a high degree of uncertainty in all aspects of business. In this study, besides making a brief review of the overall challenges for restarting business and its impact on various industrial sectors like Tourism. IT, Textiles etc. Manufacturing MSMEs supply necessary items to other industries which have also stopped their operations as a result in reduced demand and cancellations of orders. Restarting of business is a mega challenge for these industries. Most are concerned that survival is only possible with a substantive financial and fiscal support from the government.

Keywords :- Pandemic, covid 19, supply chain, MSMEs, Fiscal support.

I. INTRODUCTION

Now days, the COVID-19 pandemic is a health and humanitarian crisis, and businesses are rapidly adjusting. Global economy was not in a good shape in 2019. All the major economies were unable to sustain the growth rate achieved in 2018. The global demand had dried up and the manufacturing sector was recession hit. Corona virus not only infected the lungs of human being but infected the lungs of economy by spreading recession to the service sector. The corona virus outbreak was labeled as Pandemic by the World Health Organization (WHO) on 11 March 2020. [1]

CURRENT SCENARIO OF INDIAN ECONOMY

The pandemic has hit the Indian economy at a time when growth has slowed to the lowest in a decade (2011-2020), investments are diminishing and a consumption recovery is slow and hesitant. This has incited economists to trim India's growth projection for 2020-21 closer to 5%. The Revised Budget Estimates for financial year 2019-20 in terms of fiscal deficit was Rs. 7.6 trillion. Moreover economic impact of COVID-19 will be visible on the Budget Estimates of fiscal deficit for year 2020-21 which was approximated to Rs. 7.9 trillion. [2].The scope of study is confined Manufacturing & Logistics, Travel & Tourism, Entertainment & Media, Healthcare, Commerce, Finance, Telecommunication & Technology and Education.

II. REVIEW OF LITERATURE

In a study conducted by Daszak et. al.,(2020),to prevent the next epidemic and pandemic related interfaces, research and investments necessary in three areas: 1) surveillance among wildlife to identify the high-risk pathogens they carry; 2) surveillance among people who have contact with wildlife to identify early spillover events; and 3) improvement of market biosecurity regarding the wildlife trade. They found that the emergence of a novel virus anywhere can impact the distant or remote place of our connected world, international collaboration among scientists is essential to fight against these risks and prevent the next pandemic.

III. OBJECTIVES OF THE STUDY

The main purpose of this research paper is to

a) To analyze the impact of corona virus on various Industrial sectors of Indian economy.
b) To study the measures taken by the Industries to reduce the impact of Corona Virus.

IV. METHODOLOGY

In order to gain the insight of economic implications due to corona virus, Qualitative research method is used to explore the ideas. Content analysis method is adopted by using literature of journals of social sciences, periodicals released by international and national organizations, to rationalize the approach of study. Periodicals such as WHO, Trading economics, World Bank, CRISIL, Newspapers and media content were studied to identify the sectors and economic variables requisite for the study.

V. RESULTS AND DISCUSSION

According to the World Bank's assessment, India is expected to grow 1.5 per cent to 2.8 per cent. And IMF projected a GDP growth of 1.9 per cent for India in 2020 because the global economy is affected by the COVID pandemic, the worst recession since the Great Depression in the 1930s. Also, can't ignore that the lockdown and pandemic hit several sectors .Some of them are:

1. Manufacturing & Logistics

The foremost industry that is scorching away because of coronavirus (COVID-19) is Manufacturing and logistics. As per the market experts, 1 out of 5 top manufacturing companies rely on the China market for supply of goods and materials required for production. And since this pandemic has hit almost all the countries, finding alternative routes has also become nearly an impossible task. Something that is highlighting that the coronavirus effect on the manufacturing industry is dreadful.(3)

2. Travel & Tourism

Travel and tourism, the one responsible for 10% of the world's GDP and jobs, is yet another sector seeing the worst of coronavirus effects on industries (and is on the brink of collapse).n fact, as per the World Travel and Tourism Council (WTTC), three months of global travel losses in 2020 will result in job reduction between 12% and 14%.(3)

3. Healthcare

Pharmaceutical and healthcare is also one of the sectors that have been feeling the effects of Coronavirus on industries. When talking about the impact of coronavirus on the healthcare industry, the organizations are struggling to provide the right treatment and assistance to all the patients. Especially when they have only one-third of the number of beds required at the hospitals. They are facing the shortage of protective gear and supplies because of supply chain issues.

4. Commerce

With the proposed idea of quarantine during the coronavirus period, 80% of people are avoiding shopping from brick-and-mortar stores and malls. They are controlling their appetite for non-essential items, while focusing on purchasing essential things abnormally. Another 65% of shoppers are showing concern about the product origins. This altogether has resulted in decline in the early March total retail traffic by 9.1% – with 3.9% and 14.7% of decrease in apparel and luxury retail traffic, respectively. (4)

5. Finance

The Coronavirus (COVID-19) pandemic outbreak is also having sweeping effects on the Finance industry. When focusing entirely on the negative impacts of coronavirus , both private and public sector banks have reduced their opening hours and are serving only a limited number of customers at a time because of social distancing rules. A clear evidence of which is that the digital mortgage software provider Blend, the one with 230 bank clients, saw a 85% to 95% increase in its usage since March 4. The platform is currently processing a loan of worth $8 billion and handling 15,000 to 20,000 applications on a daily basis. (4)

6. Telecommunication & Technology

More than 50% of the global technology companies export materials from China. Because of partial or full shutdowns of plants due to coronavirus, the tech economy is also getting slower down. In fact, around 12% and 16% of decline in the production of smartphones and laptops have been observed since the coronavirus outbreak. Various financial issues have also been signified because of cancellation of tech conferences like MWC.

7. Education

Last but not least, the Education sector is also one of the Coronavirus affected industries. As per UNESCO, various schools have been shut down in 22 countries and across 3 continents, and about 421 Mn students have been disrupted worldwide. A higher fraction of them, who have been relying on mid-day meals, are now struggling to feed themselves. Whilst, many medical students have been promoted earlier to provide them a source of income to survive this period.

VI. RECOMMENDATIONS

Recommendations

In order to prevent the next epidemic and pandemic research and investment are very important in the following areas: a) Surveillance among wildlife to identify the high-risk pathogens they carry, b) Surveillance among people who have contact with wildlife to identify early unexpected events. Moreover international collaboration among scientists is essential to address these risks and prevent the next pandemic (Daszak et. al., 2020)

Considering the nationwide lockdown the tax compliances deadline should be extended and taxes need to be reduced to minimize the impact of decline in demand. Manufacturing rules should be eased for essential commodities and import duties should be reduced for the same. Merchants, Retailers and consumers should be incentivized by reducing taxes and encouraging digitized payments.

VII. CONCLUSION

The problem has to be solved by investment in research has to be encouraged to prevent future pandemics. To tackle the situation of nationwide lockdown and to shift Business Landscape after Covid-19, Localization of Supply chain, digitalization, tax relief schemes by government, less dependence on imports and awareness regarding health care are strategically very important. Moreover, policies will need to develop gradually faster than the market and

policy makers will need to be more responsive and inclusive in this dynamic environment. Hence, measured, practical and informed approach from political and corporate leaders will enable economies to steer in the post Covid -19 worlds.

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