Recent Trends and Developments in Applied Research

Kishor Kumar Dash

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PREFACE

Applied research is a methodology used to solve a specific, practical issue affecting an individual or group. This scientific method of study and research is used in various studies in order to find solutions that may solve scientific problems or develop new technology. Applied research can also be used to address everyday problems.

This Edited Book On “Recent Trends and Developments in Applied Research” tries to bring out the researches done in recent times in various areas which will prove to make this world a better place to live in.

This Edited Book addresses various topics like content based retrival using autoencoder and transfer leraning then it addresses how perceptions and buying intentions of today’s youth is affected by celebrity marketing. It further talks about Mobile cellular crowdsourcing for sharing agricultural market information, dissemination of the Oromia Region in Ethiopia. There is discussion on how Dietary habits affect the body mass index and physical fitness of athletes. Then one of the researcher talks about The societal impact of Malcolm X speech. One of the articles discusses an Empirical review on face recognition models. This edited book further talks about An efficient quality driven of face occlusion detection and recognition. Then this book also tries to emphasize on making life easy by showcasing a research on Optimisation of machining parameters for maximum tool life. Then it talks about a social cause of lessons for child rights protection officers to prevent Child sex tourism. Then it tries to put some light on Odd radio mean graceful labeling on degree splitting of triangular snake graphs. The last research Article talks about Business Networking and Relationship Building via Key Marketing Initiatives.

This Edited Book will prove to be helpful for academicians, students and research scholars.

ACKNOWLEDGEMENT

From the Editor,

First and foremost, praises & thanks to my late parents, for their shower of eternal blessings in successfully publishing the book titled "Recent Trends and Developments in Applied Research" at a time when conducting smarter research has become the need of the hour.

The pursuit of information that can be directly applied to practice is aptly known as applied research. It is an important tool in the process of understanding the human mind and behaviour while addressing the practical problems. Thanks to this kind of research, psychologists are able to investigate problems that affect people's daily lives. This type of research plays an important role in solving everyday problems that often have an impact on life, work, health, and overall well-being. However, it also contributes to our base of knowledge about how people think and behave.

The problem-solving nature of applied research means it is conducted to reveal answers to specific questions related to action, performance, or policy needs. In recent years, applied research, under the banner of operations research, has extensive applications in health and family planning programs to identifying problems and designing and evaluating policies and programs that will deliver the most significant benefit at an affordable cost.

I would like to express my sincere gratitude to the valuable authors those who have contributed their research papers for publication in this book. I am extremely thankful to my family for the keen interest shown to complete this book successfully.

Last but not least, I express my special thanks to Empyreal publishing house for extending all support in publishing this book which will be immense beneficial to the researchers, scholars, academicians and policy makers.

With Regards,

Mr. Kishor Kumar Dash, Ph.D. Scholar

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CONTENT BASED RETRIVAL USING AUTOENCODER AND TRANSFER LERANING

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ABSTRACT

The use of deep neural networks is a recent research area in content based image retrieval that has enhanced results on many datasets and outperformed handcrafted for fine-tuning of the network. The image feature is computed by combining different feature descriptors like shape with color and texture, so that it describes the image more effectively. In this paper, image retrieval on database images are doneto get the top-k most similar database images using kNN on the image embeddings with cosine similarity as the distance metric. Two Unsupervised methods are performed by generating image embeddings using a pre-trained network such as simple autoencoder ,convolution autoencoder and transfer learning such as VGG19,VGG16,ResNET152.This is done by removing its last few layers and performing inference on our image vectors for the generation of flattened embeddings. No training is needed throughout this entireprocessing, only the loading of the pre-trained weights is needed. We train both a simple autoencoder and a convolutional autoencoder on our database images with the objective of minimizing reconstruction loss.After sufficient training, we extract the encoder part of the autoencoder and use it during inference to generate flattened embeddings. This work is using transfer learning and autoencoder based retrieval system with classification. Experiments are carried out on flower and fruit datasets Thus results are recorded using GPU on google Collaboratory platform. Visualization is shown using "t-Distributed Stochastic Neighbor Embedding (t-SNE)".

Keywords— Transfer learning, T-SNE, VGG16, VGG16, ResNet152,Training autoencoder

1. INTRODUCTION

Day by day in the world processing and retrieval of images from social media is increasing and is storedin database. There is a need for scalable and efficient retrieval algorithm for indexing and searching images. The semantic gap between representation and features vectors for low or high or fusion of features is important issue to be considered In this era of deep learning algorithm semantic gap can be reduced by usage of transfer learning and CNN autoencoder. In image retrieval major issue is feature extraction which correspond to color shape texture which we extract allow to have efficient retrieval way of the images. In case of big image database, hand crafted features. like color histogram, gradient oriented histogram like SIFT and SURF have proven to be strong for image retrieval applications .Recent advancement has led us to use deep learning algorithms. This research we demonstrate the use of fully connected autoencoder, multi-layer convolutional autoencoder and transfer learning VGG16,VGG19,ResNet152 for object retrieval where training is not needed as it a unsupervised learningapproach to generate neural codes is easy which is costly and time consuming, neural codes are the features used to describe images. It is proven to be state of the art approaches on many datasets. where the autoencoder comes into come into picture.Technology is enhancing day by day, interesting research areain digital image processing is image retrieval with the increasing number of images available through internet and stored in databases, which led to importance of scalable search algorithms. Selecting image structures, feature vector measurement, process and technique for presenting final results are some of theproblems which disturb the scheming of object retrieval. Indexing and matching images has become challenging to overcome semantic gap by using low or high or fusion features in case of large diversity of image databases[4][5].Uunsupervised learning technique is autoencoders where neural networks are used for the task of representation learning, which impose a compressed knowledge representation of the original input. Optimization technique is transfer learning which allows rapid improved performance while building the second task. It is learning in a new task from the knowledge of related task which is already learned.

2. LITERATURE SURVEY AND RELATED WORK

Ruigang Fu, Biao Li, Yinghui Gao, Ping Wang[1] proposed “convolution neural network” using linear support victor machine for feature representations and to perform the similarity measures. Mayank Jain and Divakar Singh[2] proposed methods which compares all the feature extraction techniques.Ramesh K Lingadalli , N.Ramesh[3] proposed a method to enhance the image retrieval multiple features can be used to represent the whole image property.Proposed algorithms improve the accuracy and performance of retrieval system.Satish Tunga, D.Jayadevappa & C.Gururaj[4] presents do’s and don’t do with respect to various distance measures. Nishant Shrivastava, Vipin Tyagi [5] proposed technique in which global region features are used which gives good results consumes less computation time for large image sets. Yogita Mistry, D.T. Ingole, M.D. Ingole[6] proposed blend of feature based system using distance measure. Jun Yue , Zhenbo Li , Lu Liub , Zetian Fub[31] proposed a fusion of color and texture based method which gives more accuracy .Ahmed J. Afifi and Wesam M. Ashour[32] used ranklet transform for pre-processing and image enhancement operations thus images are clustered with k means clustering

. Y. Rui, T.S. Huang , et al [33] proposed relevance feedback which was adjusting the query using feedback by the user for multimedia object model . Lei Zang, Fuzong Lin, Bo Zhang [34] proposed SVM where classification learned from training data .Pengyu Hong, Qi Tian, Thomas S [35] proposed SVM in whichlearning method is based on both positive and negative feedback depending on weights. Y. Lu, C. Hu at al [36] proposed a framework for retrieval at a given time simultaneously. Dacheng Tao and Xiaoou Tang

[37] proposed SVM based on random sampling which overcomes over fitting due to the feature dimension. Johnny Ren[25] proposed a CNN model based on the cloud-computing platform in which feature maps are used for learning and classifying multi-modal images**.** Huafeng Wang, Yanxiang Zhang B[26] In this papers author build retrieval system which is highly describes feature extraction, feature processing and feature indexing needed for fully connected convolutional neural network. CNN model outperformed for generalization, relationship between the dimensional reduction ,accuracy loss, distance measure and coding techniques for improving the efficiency of CBIRs. Based on the binarization property of CNN features, high percent and achieve higher speed computation can save the storage and memory . Jin Xie, Guoxian Dai, and Yi Fang[27] propose a deep multimetric network for multidimensional shape retrieval which minimizes discriminative loss function for each type of shape feature,The fused distance metric with the learned weights are used as the similarity for shape retrieval. .M. Praveena, V. jaiganesh[28] propose research article with decision trees and support vector machine and presented supervised machine learning algorithm with boosting process increasing prediction efficiency.

3. PROPOSED WORK

Given a set of query images and database images, we perform image retrieval on database images to get the top-k most similar database images using kNN on the image embeddings with

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Euclidean similarity as the distance metric. We consider class of fruit, vegetable and flower database 10 images of each class carrot, sunflower, kiwi and perform similar image retrieval by querying 3 unseen test images. We applied two unsupervised methods such as trained and pre training network which is time consuming and task is monotonous.

3.1 Methodology

"Content based retrieval" is a retrieval mechanism features of key image is associated with the features of images in the database based on similarity metrics ,relevant images are retrieved from database .In this paper we have considered two unsupervised methods which are used for generating embedded images using a trained and pre-trained network such as simple autoencoder ,multi layer convolution autoencoder and transfer learning such as VGG19,VGG16,ResNET152.It is performed by removing its last few layers and inference on image vectors for the generation of flattened embeddings. No training is needed throughout this entire processing, only the loading of the pre-trained weights is needed. Trained network such as a simple autoencoder and convolutional autoencoder on the database images with the objective of minimizing reconstruction loss. After sufficient training, we extract the encoder part of the autoencoder and use it for inference to generate flattened embeddings. The system is developed performed by employing transfer learning and training autoencoder for classification based retrieval system. Experiments are carried out on flower and fruit ,vegetable datasets .Thus results are recorded using GPUon google Collaboratory platform. Visualization is shown using "t-Distributed Stochastic Neighbor Embedding (t-SNE)".

3.1.1 Image processing tools

Intial we have applied image processing tools .We consider a image apply image processing techniques:like greyscaling force resizing, K-means color quantization based cluster center colors and custom colors,,Edge detection we apply Gaussian blur and Sobel) processed images from the output directory before training images . As shown in Fig 3.1

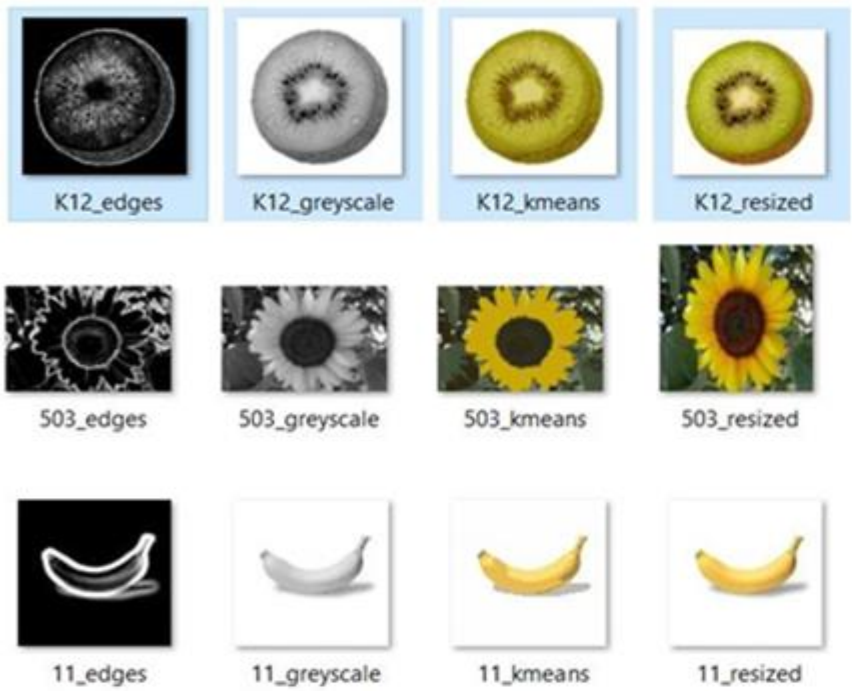

Fig3.1 Image processing like soble Edges ,greyscale, kmeans resized

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3.1.2 Transfer learning

By performing generating image embeddings using a pre-trained network such as VGG19. This is done by removing its last few layers, and performing inference on our images vectors for the generation of flattened embeddings. No training is needed throughout this entire processing, only the loading of the pre-trained weights as shown in Fig 3.2

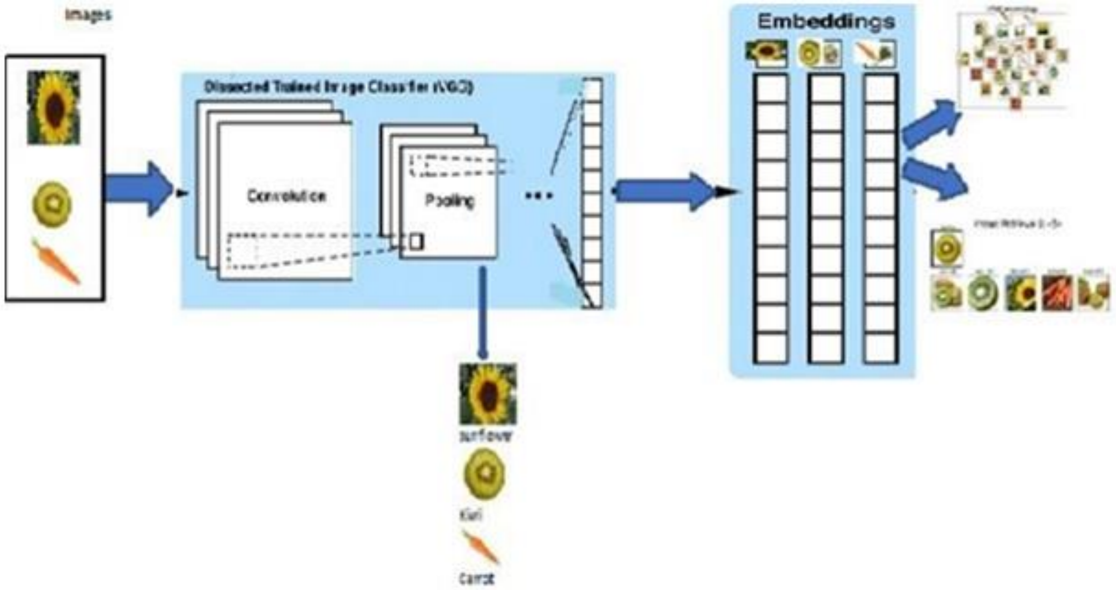

Figure 3.2 shown transfer learning

3.1.2.1 VGG16 and VGG19

VGG16 is a excellent convolution neural network vision model architecture.VGG16 have a large number of hyper-parameter consisting of convolution layers of 3x3 filter with a stride 1 2X2 filter , padding 2X2 filter and maxpool layer 2x2 which is followed throughout the whole architecture. For output it uses 2 fully connected layers followed by a softmax which uses 16 layers with weights. For large network it uses 138 million parameters.VGG19 is variant of VGG16 difference lies between the number of layers used has 16 layers in its architecture while the VGG19 has 19 layers. As shown in the figure below 3.3

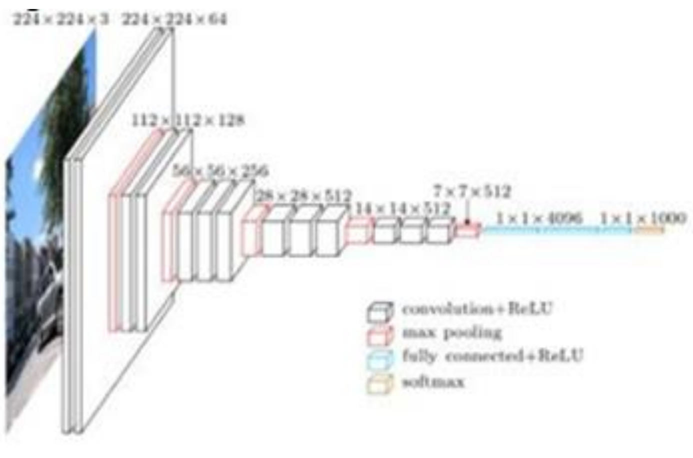

Figure 3.3 shown VGG16 Framework

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3.1.2.2 ResNet152

Residual Networks consists of 152 layers which is an deep convolutional neural network used as a transferlearning framework it uses the weights of pre-trained imageNet. As shown in the figure below 3.4

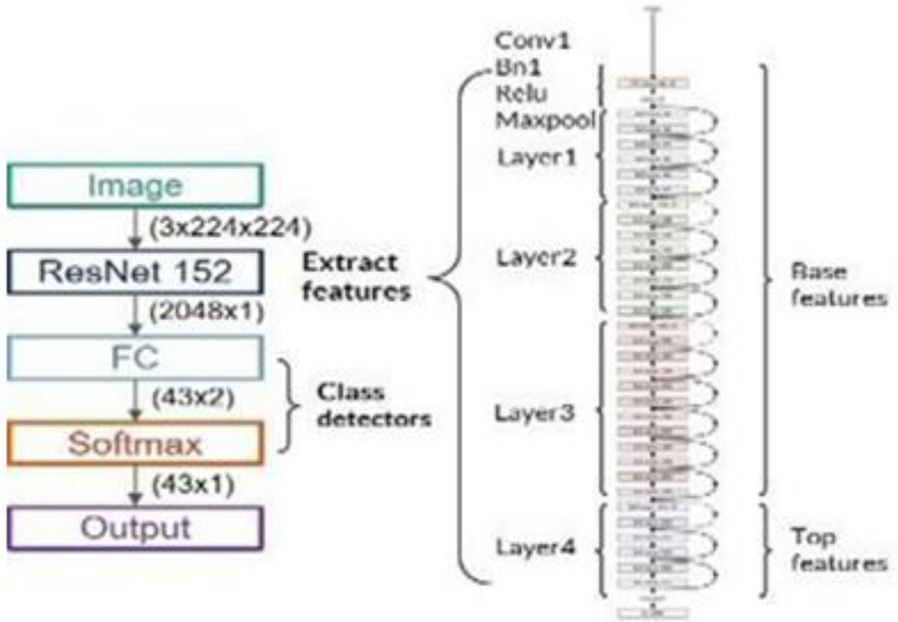
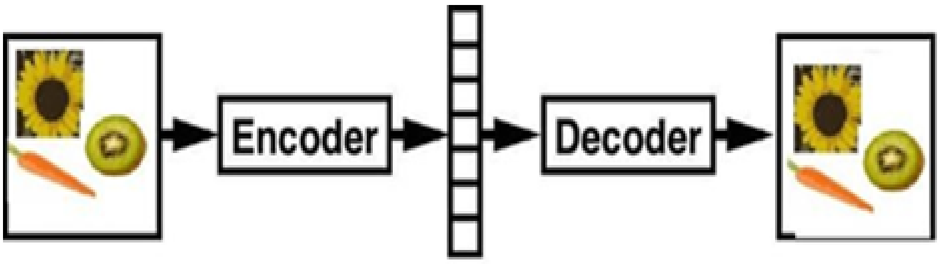


Figure 3.4 shown transfer learning

3.1.3 Training Autoencoders

We train both a simple autoencoder and a convolutional autoencoder on our database images with the objective of minimizing reconstruction loss. After sufficient training, we extract the encoder part of the autoencoder and use it during inference to generate flattened embeddings. As show belowin Fig 3.5



3.2.3.1 Simple autoencoder

Figure 3.5 autoencoder framework

Autoencoder are compression and decompression neural network uses encoding and decoding function. Used to find distance between compressed and the decompressed data representation between the amount of information loss.To. minimize the reconstruction loss using Stochastic Gradient Descent. parameters of the encoding and decoding functions is used. Data denoising and dimensionality reduction for data visualization is also performed by using it. Given below in fig 3.6

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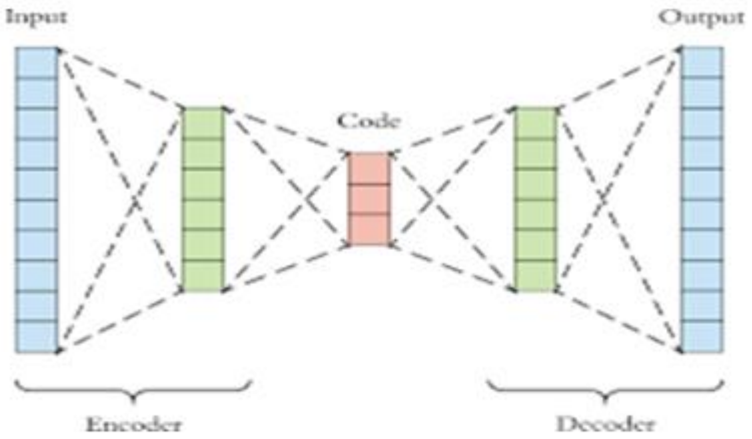

Figure 3.6 ResNet152 framework

3.2.3.2 Convolution Autoencoder

Autoencoder is used when input images in convolution neural network are to be encoded and decoded using encoder and decoder. It uses the convolution operator. Learn to encode the input in a set of simple

signals and then reconstruct the input to modify the geometry or the reflectance of the image. Image reconstruction, colorization ,latent space clustering is performed to generate higher resolution images. Autoencoders reduce the size of our inputs into a smaller representation where original data can be reconstructed from the compressed data. As shown in fig 3.7

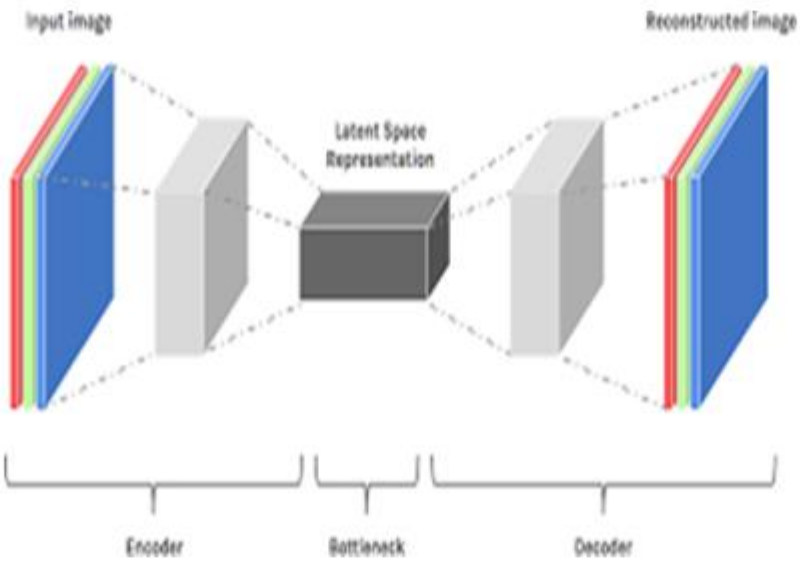

Figure 3.7 CNN autoencoder framework

4 .COMPARISON OF METHODS

Good strategy for visualizing similarity relationships in high-dimensional data in 2D visualization t- SNE.is gave good performance hence autoencoder is used to compress data into a low-dimensional spaceof 32-dimension t-SNE is used for mapping the compressed data to a 2D plane.

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4.1 Transfer learning methods

By performing generating image embeddings using a pre-trained network such as VGG16,VGG19 and ResNet152. This is done by removing its last few layers and performing inference on image vectors for the generation of flattened embeddings. No training is needed throughout this entire processing, only the loading of the pre-trained weights .Results are given below in Figure 4.1

Figure 4.1 ResNet152 VGG16 ,VGG19 output for k- top images and T-sne Visualization

4.2 Training Autoencoder

We train both a simple autoencoder and a convolutional autoencoder on our database images with the objective of minimizing reconstruction loss. After sufficient training, we extract the encoder part of the autoencoder and use it during inference to generate flattened embeddings

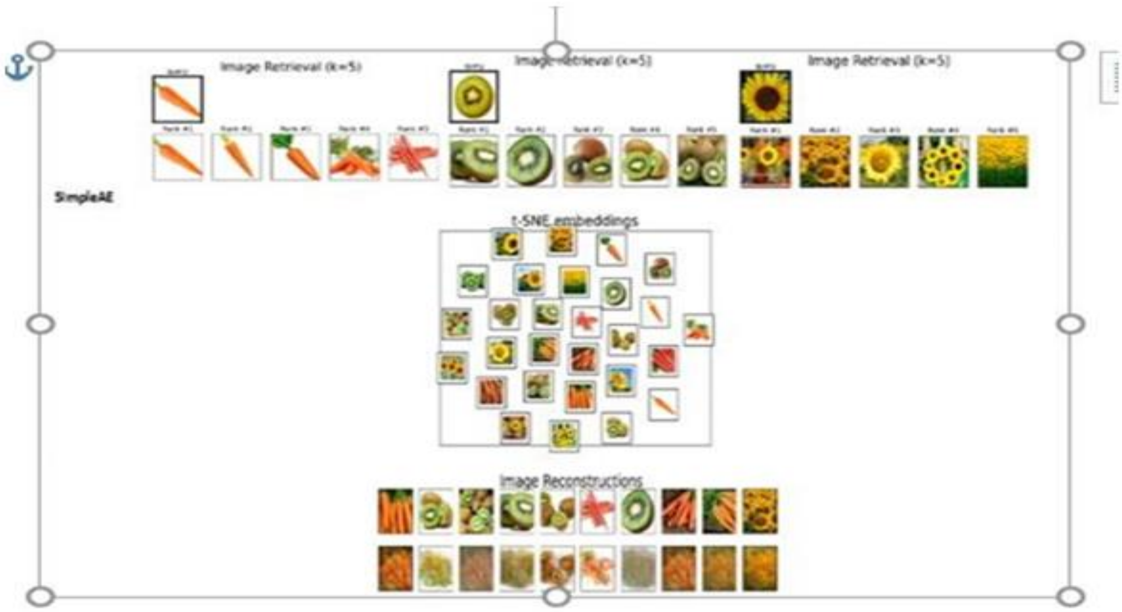

Figure 4,2 Simple Autoencoder output for k top images and T-SNE Visualization

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Figure 4,3 Convolution Autoencoder output for k top images and T-SNE visualization

5. CONCLUSION

In this proposed method which is based on two unsupervised method one without training and other with pre trained network. The transfer learning methods like VGG16,VGG19,ResNet152 out of which VGG16gave 100% results and training with autoencoder simple autoencoder gave 100% result compared to convolution method. Content based retrieval performance can be improved and also semantic gap can be overcome by by using Transfer learning and transfer autoencoder, The propose work we can state that deep learning algorithm outperform in Content based retrieval for large dataset to reduce semantic loss.Future direction we can think in the way how computational time ,usage of less storage can be takeninto consideration for adequate task..

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AFFECTING PERCEPTIONS AND BUYING INTENTIONS OF YOUTH WITH CELEBRITY MARKETING

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ABSTRACT

"Celebrity" is the one who make the public aware and attract them towards a brand. Youth get attracted toward the brand quickly so companies usually prefer their brand ambassador to be well known in the society. The general belief among advertisers is that advertising message delivered by the celebrities provide a higher degree of appeal, attention and possibly message recall than those delivered by the non-celebrities. In the world almost more than 40% of population are youth. This study attempts to understand that why brand ambassador of companies has such a colossal impact on the perception of the youth. Their awareness and perception related of FMCG brands are hugely impacted by these endorsements. The perception of youth regarding FMCG brands is hugely affected by celebrities. It was also concluded that the youth primarily believes that celebrity endorsed advertisement are reliable. FMCG brand companies endorse their products from some famous or well-known personalities to attract the youth and instigate them to purchase their brand extensively.

Keywords: Brand Ambassador, Youth Awareness, Advertisements, FMCG Brands, Celebrity Endorsement.

INTRODUCTION

Advertising is a marketing approach encompassing paying for space to promote a product, service or a social cause to the public. The tangible persuasive messages are named advertisements or ads for short. The purpose of an advertisement is to extend to people who are most likely willing to pay for a company's product or services. They are enticed into buying these offerings. It is the performance and repeats used to bring products, services, sentiments, or social causes to community notice with the purposefulness of urging the community to retort in an assured way regarding what is advertised.

While celebrity endorsement is the type or form of an advertising promotion or a marketing strategy employed by companies that promote and celebrate a brand which encompasses celebrities or recognized personalities expending their social status and eminences to support a product. In vindictiveness of the fact that the spectators are getting keener and cleverer, there survives a section of advertisers that still rely upon celebrities and their attractiveness for publicizing products. Hiring celebrities for advertising marks into making a contract with them. They have to be signed up for numerous advertising crusades, which consist of all genera of advertising including, print ads, television ads, social media platforms.

Perception of the target audience can be apprehended by recognizing as well as decoding the sensory information used by them about an advertisement. As the celebrity's characters who have an eye-catching lifestyle and an outgoing and philosophy. Their powerful impact on a person's thought process effortlessly inspires the audience especially younger ones. Their thoughts, beliefs, concentrations, and attitude towards trends and fads are easily affected.

Children are also effortlessly induced with what celebrity's project and they are easily accepted as role models. Celebrity endorsement has become an indispensable part of today's advertisement world. Celebrity promotion has become quite prevalent and even small companies have started linguistic communiqué via celebrities for their brand validations. Celebrities don't just advertise but they add a tinge of glamour.

ADVANTAGES OF CELEBRITY MARKETING

There are so many advantages of celebrity marketing. Few of them have been explained below:

NEWER AUDIENCE CAN BE TAPPED

When a renowned face endorses a company, it mechanically fascinates newer spectators especially the staunch fans of a celebrity. People who have normally not bought much of a brand will try it at least once because their most admired star or celebrity or model has been talking about it and authorizing its use.

BRAND PERSONIFICATION CAN BE DONE

A celebrity can ensure that that the profile of a company or a brand pairs with his/her personality which is directly symbolized by the audience. For example: Salman Khan has recently agreed to become a brand ambassador for the much-admired brand 'Pepsi'. He has been taken for his aura (swag) and single status that he proudly flaunts. These are the traits Pepsi aims to promote as well.

TRUSTWORTHINESS DEVELOPMENT BY A BRAND

People derive trust form the celebrity endorsing a brand. Celebrities are very strong ideals for the followers. In this extremely inhabited world, each celebrity that you'll encounter usually possesses lakhs of fans thus getting the thumbs up from a large cluster of people who are instrumental in bringing a lot of success for the brand they are endorsing. Now once these capacious folks can be an important link in escalating the value of a brand. This value can unconsciously progress within the most undeviating amount of time.

DISADVANTAGES OF CELEBRITY MARKETING

Some of the disadvantages of celebrity marketing have been discussed below:

CELEBRITIES LIMITED POPULARITY SPAN

One of the prime issues of endorsements done by celebs is that as soon as the celebrity loses his status and once the craze regarding the celebrity is off, the quantum of fans also will begin to recede and the company might feel the magnitudes of the problem too. This is the main reason why most organizations work on a contractual basis with these celebrities and make a periodic assessment to extend or replace the contract with existing celebrities and personalities at the end of the contract. Soft drink companies keep on changing their endorsers as per their popularity in the industry. Depending upon the type of personality a celebrity possesses they are chosen to represent a brand over different periods of time

CELEBRITIES OVERSHADOW BRANDS SOMETIMES

This is a common problem. Sometimes celebrities overshadow a brand. Their aura instantly overshadows the brand. If this happens it hampers the money that is spend on brand promotion. This stands the reason that some advertisements rely on more than one celebrity. Another issue lies the attention and the linkage of media on a new project taken up by a celebrity, publicity, press conferences all stressing more upon the celebrities upcoming project rather that the brand that he/she is endorsing. This shifts the attention on the celebrity rather than on the brand.

CELEBRITY ENDORSEMENTS ARE PRICY

Now this is a very palpable issue. So, unless the company is able to spend a lot of money from the company's revenue, using celebrity promotion can be a very heavy investing and so there shall be no whirling back once commitment is done. A lot of thought has to be put in by the company before venturing into this marketing.

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If a comparison is made with the last decade, there has been an escalation of advertisements on television that have a celebrity who has been projecting a product or service. The celebrity has been able to influence the audience by the way of projecting the image of a brand in congruence with his personality and aura. Companies are enthusiastic to pay even a high price for this to the celebrities. This also projects a need on behalf of the companies to choose their brand ambassadors very smartly because it is the celebrity's image that is being projected in a product or a service.

As we all known that almost all are using using the FMCG products in the daily life. Products offered by FMCGs are small but they are vended in large quantities. These are usually relieved or over a short period. It is significant to have a deep understanding of the postulations and philosophies held by patrons vis-à-vis these merchandises. Some consumers may use the price parameter as an index of the level of quality of a product whereas others may make different assumptions about a product. Sales may be based upon seasons, occasions. They may depend on the lifestyle of the consumers. As this study is about the youth perception towards the celebrity endorsement, it is necessary to understand how celebrities influence the attitudes and behavior of the youth.

While celebrities may put negative as well as positive impact on the youth as they attract them and, in many cases, they are the role models so they influence youth easily. However, in some cases they can also have a negative impact on the youth. There have been instances of famous celebrities leading to a negative impact on the youth. In specific, celebrity impact on the physical look and use of certain substance has often seen to be detrimental to youth especially teen mental health. They usually influence the youth negatively when they post their images drinking or smoking or promoting wrong causes on social media. Another issue has been raised by few well known celebrities have spoken out against the standards of beauty being endorsed by the advertising world. These ideals are blindly followed by the youth and are definitely not good.

Furthermore, it was also found that seventy one percent of the beverage endorsement encouraged sugar loaded drinks. Heavy amount of sugar consumption can lead to so many health issues amongst the youth blindly following what their favourite celebrities are endorsing. Also, around eighty one percent of the recognized foods were suggestively low in wholesome nutrients.

The modern world of marketing is flamboyant and swamped with advertisements, and it has become very challenging to get noticed in such a clutter. Celebrity support, if implemented efficiently, makes the brand gleam, stimulates brand recollection and expedites instantaneous consciousness amongst the consumers and to accomplish this, the seller really needs to be meticulous in selection of a celebrity. The contemporary modern societies stipulate ever accumulative chances for impromptu expenditure especially in the FMCG categories. Brand commendation by celebrities stipulates a way to get the product spotted amongst the disorder dominant in the market.

The celebrity actually assists in snowballing the brand aura and appreciation. Though celebrity commendation provides an approach to enable the brand to be detected amid the chaos dominant in the marketplace, the celeb essentially aids in accumulating the aura of a product. The verdict of choosing the best celebrity advocate is thus a relevant matter to be considered by the marketers and promoters for their image elevation.

The celebrity supporting a brand must be a robust personality brand and the attributes of the celeb must be equivalent with the aspects of product or service being emphasized upon by the marketer. Endorsing a celebrity does not give a guarantee for sales but they do play an imperative role as influencer in decision making process. Celebrity endorsement has become a fundamental part of these days commercial advertising world especially in FMCG sector. It is a popularly celebrated fact that the finest of testimonials accomplish an effectual stability between the product attributes and the celebrity traits. It can create a good feeling in the consumer. He might feel superior about using a product, which in turn give a sense of trust and belongingness of celebrity towards the brand because a celebrity is a recognized character who relishes public gratitude to a large extent. Marketers world works very harder to make brands popular by spending a huge amount of money every year on endorsing a brand through a celebrity. Many researchers have explored the concept of celebrity marketing and its effect on the consumers. some of the studies have been reviewed below:

Bimal Kaur, 2012 in her study was of the opinion that there are so many celebrities who represent diverse types of brands. This sometimes creates a confusion in the observances of the patrons regarding different brands, their propositions and their images. This paper help to understand the celebrity endorsement and non-celebrity endorsement and the perception of the customer towards the brand. As it talks about the difference between both types of ads; the celebrities' ads or non-celebrities' ads and how they influence the customer mind and their buying decisions. Arora & Anuj, 2015 opinionated that the marketers can see the analysis and results of the most of their brands. An attraction of the consumers towards a brand ambassador usually impact their buying behavior. This paper helped in figuring out the perception of people towards those brands which are endorsed by the Bollywood Celebrities. The paper helps in understanding why celebrity endorsements are necessary and how it attract customers for a particular brand. Kaur, Garg, 2016 in their study researched on the concept and opinionated that there was a way in which celeb marketing needs to be adopted by the marketers. Which kind of personality suits for a particular brand is the idea that needs to be pondered upon. The choice of a good celebrity is very important as this thing put a constructive impact on the mind of the shopper and give them better understanding of that particular brand.

Goutam, 2013 in his study emphasized that the real thing which contributes to the brand building process is the manifestation of a celebrated personality who symbolizes the product in such a way that helps in unravelling the difficulty of excess communiqué. As per the perception of consumers if any brand is endorsed by a credible source than it is believed to carry a superior quality and that is a specific reason why firms also invest huge amount on the advertising outflow. A research was carried out in Belgaum city on a sample of 100 respondents between the age between 17 to 35 years. Data was collected from both the primary and secondary source. The research explored all about the buying behavior of consumer and their perception towards soft drinks and it was concluded that tend to buy the product primarily because it endorsed their favourite celeb. Kumar, 2010 analysed that India happens to be a place where celebrities are adored and they hold God like status. People have continuously worshipped celebs (Katyal, 2007). Marketers take a benefit of this thought process to inspire the customers psychologically How these prominent characters are prompting the procurement conduct of the target market is an interesting thought. Singh, 2014 in his study suggested that it is very significant for a marketer to know and understand how the choice of brand ambassador affect the demand of a product in the rural areas. The study was done in the rural area of Haryana and it was observed that the rural people of these areas were not only aware about the celebs who were endorsing the brand but were well influenced by them as well. They were completely informed about which famous personality was endorsing which brand. Jeevananda, 2011 in his study made an attempt to understand how people differed in their perception about those FMCG brands that were supported and validated by celebrities. They believed that it framed their opinion about the price, quality, packaging as well as other traits of a product. It was however concluded that celebrity marketing was the best thing that could be adopted by a marketer in today's era.

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MOBILE CELLULAR CROWDSOURCING FOR SHARING AGRICULTURAL MARKET INFORMATION: DISSEMINATION OROMIA REGION, ETHIOPIA

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ABSTRACT

Agriculture takes center stage as the engine that can transform nations' economies. Smallholder farmers, who produce the majority of agricultural products, face various challenges, including access to adequate information, services, and key value chains. Information is dynamic and its source is distributed among the public and must be communicated, and all stakeholders get access to it. In Ethiopia's case, agricultural information, agro-market information, is important due to the fact that Ethiopia depends on agriculture. Sadly, there is an information gap between the various stakeholders, I,e the farmer and the business man regarding market information. So, updated agricultural market price information is strongly recommended.

Keywords: Agriculture, Information, Mobile phone, Ethiopia

1. INTRODUCTION

1.1 Background

People groups utilize common language to appropriate data and get the new information from one another. Exceptionally, in Oromia provincial territory where the ranchers share data is at market. In exchange adventures, the vast majority take an interest on agrarian market trade share market data. On the off chance that they need data that is at far separation they depend on different innovations like cell phones. The accessibility of market data is basic for people and nations' and local financial development. By its inclination market data is dynamic and its source is appropriated among people in general and should be conveyed so all partners gain admittance to it. ICT administrations give basic admittance to the information and data and innovation that ranchers need to improve the profitability and along these lines improve the nature of their lives and occupations. It is, henceforth, essential to furnish ranchers with the information and data in a quality and opportune manner. Publicly supporting can assume an imperative function in gathering market data from the overall population and give it back to the general public [1]. Information and Communication Technology is believed to play a pivotal role in disseminating information and linking farmers with clients in the agricultural value chain (Bayissa. U, 2014).

1.2 Motivation

Crowdsourcing is taking more quality in the research community, regardless of the fact that it is a recent concept in information technology [13]. This is because it is a way of collaboratively doing tasks or solving problems. In the developed countries, people are using crowdsourcing to be successful in their business areas (like market analyses and branding) and also solving their problems such as natural language processing (e.g., collaborative translation [4]) and mutuality of knowledge (e.g., Wikipedia [8]).

It is time for developing countries like Ethiopia to share the success and power of crowdsourcing in solving problems in different areas, especially in the agro-market area which is becoming very hard and competitive for the farmers in the rural areas that don't have much access to ICT. The following scenario will illustrate this concept.

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Assumption and scenarios

When farmers produce an agricultural product and prefer to promote it, they have to take their products to the nearby market and at once promote it to the clients or market brokers who will purchase their product and take it to different markets. As many farmers stay in rural areas, they solely have get right of entry to to the nearby market charge and they have to be counted on what others informed them about market expenses in different market places, particularly about fees in city markets. Due to this, unknowingly they will be compelled to promote their merchandise in lower priced and unfair expenses to the brokers that will promote the product in different markets with a massive profit. If there had been a way or a capability for the farmers to have the aggregated market rate facts for their product in the established market,they should have offered their products in a honest price.

What we can see from the above state of affairs is that, due to lack of market records in rural areas, farmers are now not getting what they deserve for their product and have persevered to count on market facts furnished and tested via ordinary viva-voice approach. We can additionally see the want for a provider or a technological machine in which it is feasible to talk market facts in a way appropriate and low cost to farmers in rural areas the place there is no laptop or Internet connection however solely low-end cell devices.

1.3 Statement of the Problem

Increasing production is a major challenge facing present agriculture. Smallholder farmers which dominate the landscape of developing world need to improve farming through acquiring adequate knowledge and information (Aker, 2010).

One of the fruitful execution areas of publicly supporting is gathering enormous volume of data or information from a group and giving them to the public utilizing ICT [9]. One of the issues in Oromia with respect to data sharing of exchange between rural areas is the absence of ICT uphold. This issue is amplified in horticultural showcasing where the ICT uphold is nearly non-existent. Thus, we suggest that planning and building up a publicly supporting assistance can be an answer for this issue.

As Abdo et al. [15] described that ICT has become driving force in today’s society strengthening national economies and supporting democratic processes throughout the world and in this country. In our country and also in Oromia region agro-market information is very important due to the fact that most parts of Oromia community depend on agriculture. But there is a gap to share updated agro-market information between the various stakeholders, namely the farmer and the business man. Even if there are middle bodies that are responsible for collecting and providing market information in a variety of levels, they doesn’t have coordination of ICT support among themselves and with the stakeholders [2].

The fundamental trouble that extraordinary researchers identified is when farmers produce an agricultural product and prefer to promote it, they have to take their merchandise to the nearby market and without delay promote it to the clients or market brokers who will purchase their product and take it to different markets. As many farmers stay in rural areas, they solely have get entry to to the neighborhood market fee and they have to remember on what others advised them about market expenditures in different market places, in particular about expenses in city markets. Due to this, they will be pressured to promote their merchandise in low cost and unfair expenses to the brokers that will promote the product in different markets with a giant profit. If there had been a way or a potential for the farmers to have the aggregated market fee data for their product in the regularly occurring market, they may want to have offered their merchandise in a truthful price. What we can see from the above state of affairs is that, due to lack of market statistics in rural areas, farmers are now not getting what they deserve for their product and have persisted to be counted on market facts furnished and confirmed via regular word-of-mouth approach.

The Organization which is known as Ethiopian Commodity Exchange (ECX), an authority that provides market prices for commodities like Coffee and oil-seed products, plays a great role in bringing together the stakeholders and minimizing the aforementioned information gap [10].

The ECX, try to provides an ICT supported system to the users and is able to provide a fair market price for the farmer and the businessman by collecting market prices and collecting the products from the farmers in their satellite offices and biding the products on the exchange system and thus, allowing the farmers to sell the product by the bided value. Products along with their bid prices are transmitted live on sonic screens that are found in various regions of Ethiopia. Even though ECX is playing a vital role in providing market information to the general public, it has limitations due to the fact that at the first it only concentrates in few products and the price information's are only available in places that the sonic screen is available [10] and at the second it is only depend on international market which doesn't help the local market which is farmer based. At the third it doesn't support crowdsourcing which is agent between farmers, stakeholders and different government sectors those are responsible to control agricultural market.

1.4 Research Questions

Hence, the problems to be addressed by this research are:

- How to enhance the home fee seize mechanism and graph crowdsourcing structure for low- end cellular systems?
- How to extend the degree of charge co-ordination and alternate in Oromia rural areas via the on hand ICT?

What variety of ICT aid can be used to fill the collaboration and sharing hole that exists in the agricultural market information?

1.5 Objectives

General Objective

The general objective of this research is to study Mobile Cellular Crowdsourcing for sharing agricultural market information in Oromia rural areas that provides agro market price gathering analysis and dissemination.

Specific Objectives

The specific objectives of the research are:

- To study problem of traditional agricultural market information sharing between farmers and different stakeholders.
- To identify most challenges hold back to use ICT based crowdsourcing for agricultural market information
- To capture existing market information exchange and transforming into crowdsourcing architecture
- To forward recommendation for agricultural and trade related government sectors.

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1.6 Methodology

In undertaking this research, the following methodologies will be used:

- **Literature Review**

This research will be conducted by first reviewing a number of related literature's and various crowdsourcing services so that it will be easier to choose the appropriate tools and platforms that are required to develop the crowdsourcing architecture.

1. **Studying and assessing existing services**

We will also study the existing agro-market information sharing mechanism and model it. This will help us to come up with and propose a new crowdsourcing architecture that fits to our context and need.

Scope and Limitations

There are many sectors that require information sharing regarding to market but the scope of our study is focus on ICT supported sharing of agricultural market information, which mainly focuses on collection and analysis of market prices for agricultural products and service. While developing the prototype for the crowdsourcing service, we will be limited to focusing on two languages, Afaan Oromoo and Amharic. The proposed system is also limited with agricultural market information exchange.

Significance and Application of Results

Some of the significance of the research are:

- ✓ It provides better and fair agro-market product prices for various stakeholders such as farmers, market brokers, exporters, sellers or anybody interested.
- ✓ It supports to having a service for collaboratively sharing agro-market information using mobile phones SMS text service.
- ✓ It can also be used as a base for other crowdsourcing researches.
- ✓ localizing crowdsourcing mechanism for solving problems.

2. LITERATURE REVIEW

2.1 Crowdsourcing

Computer is one of the greatest inventions developed by human as a computational tool. After the invention of computers, humans have tried to automate their tasks and problem solutions so that they can easily be done by computer programs. Sadly, many tasks that are trivial for humans continue to challenge even the most sophisticated computer programs [11]. These problem forces the idea of crowdsourcing to be proposed. The main idea behind crowdsourcing is the wisdom of the crowd. In his book [9], Surowiecki explains wisdom of the crowd as being the collective knowledge, resource and creative power of a group of individuals. According to Surowiecki, under the right circumstances, groups can actually make better decisions than even the smartest person within them. This can be paraphrased as when performing a task or coming up with a solution, a group of people can perform the task or produce a better solution than a single individual or few individuals. Crowdsourcing has been proved to be effective in areas where the tasks can be easily described to humans and where these tasks are easier to do for humans than for computers [12].

The characteristic of crowdsourcing tasks is that they are typically difficult to solve by computers and easily accomplished by humans. Such tasks like image annotation and data gathering and analysis require the combined effort of human labor and computer's computational power.

Types of Crowdsourcing

As Gupta *et al.* [13] explains, recently there are a number of crowdsourcing systems and applications which are developed for accomplishing a certain task or solving a given problem. Crowdsourcing applications and systems can be categorized based on two main factors [11]. The first one is based on the type of platform used to develop the crowdsourcing application and the second category is based on the type of application the crowdsourcing system is to be used.

Crowd sourcing Based on the Platform

Crowd sourcing applications based on the platform on which they would be implemented can be grouped into two; web based and mobile based.

a) Web Based Crowdsourcing

As Man-Ching Y. et.al, propose [11] the Internet has become an essential web based platform for seeking and sharing information, communication, presentation, and collaborating for many users. This is facilitated by many applications, platforms, and services that are provided on the Internet [11]. For many of these systems, it is essential that Web users actively participate in generating content and providing services. This forces the creation and implementation of various crowdsourcing websites.

b) Mobile Based Crowdsourcing

Mobile phones are not only empowering most humans on the planet to connect with each other in real-time communication, but also allow us to coordinately share and analyze information, perform computational tasks and soon phones will enable anyone to conduct real-time, peer-to-peer financial transactions. Mobile devices now function as fundamental tools instrumental to billions of economic livelihoods [16]. Recently, the interest of developing crowdsourcing applications for mobile platforms has grown. This is due to the fact that mobile technology and devices have attracted a huge number of users all over the world as they have become smarter and more equipped with computational power [17].

Crowdsourcing Based on the Application

The authors of [11] grouped crowdsourcing applications into four categories based on the area in which the crowdsourcing applications are used for and they are voting system, information sharing system, game, and creative system.

Issues in Crowd sourcing

Lately, researchers and developers have become interested in crowdsourcing after seeing its various advantages. When developing a crowdsourcing application there are various issues to be considered. The authors in [11] stated that the major issues in developing a crowdsourcing application are: crowd participation, motivation, algorithms, quality assurance, and cheating detection.

The crowd is the one who is responsible for generating the content which can be information, data, or knowledge. The crowdsourcing applications relay on and make use of this crowd generated content to perform a task or solve a problem.

3. RESEARCH METHODOLOGY

3.1 Literature Review

This research will be conducted by first reviewing a number of related literatures and various crowdsourcing services so that it will be easier to choose the appropriate tools and platforms that are required to develop the crowdsourcing architecture.

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3.2 Studying and assessing Existing services

- In order to develop the crowdsourcing architecture, we will study the existing traditional agricultural market information sharing between farmers and different stakeholders.
- We will collect the data regarding to agricultural market information from written material, observation and interview.

A Sources of Data

In order to mitigate the stated objectives we will use both primary and secondary sources of data. The primary data collected will be from the survey of Oromia regional zone cities and districts. The secondary data collected will be from records and documents those are found in Oromia Trade Office and Oromia Agricultural Office.

B Developing a prototype

We will design the architecture and develop the prototype of crowdsourcing service that will provide users the ability to share and access agro-market information on their mobile phones using an SMS text that is written in natural language, in our case Amharic or Afan Oromo.

To develop the prototype, Java programming language will be used to develop the crowd management interface, which is responsible for collecting and gathering the incoming and outgoing SMS texts. The database needed for the data will be handled by a dynamic crowd database that is capable of handling crowd database queries. In order to rate and analyze the natural language data gathered from the crowd, a combination of ontological (semantic) approach and statistical analysis will be employed.

4 CONCLUSION AND FUTURE WORK

4.1 Conclusion

Among trendy ICT modes, mobile telephone has been most up-to-date and wide accepted mode of delivering info not only in African country however conjointly in alternative South Asian and alternative African countries. in keeping with Baumüller (2015), many studies conclude that the final use of mobile phones to access info has helped to cut back search times and prices. Increasing movable and mobile phone based mostly services enhances the provision to information and knowledge and can any facilitate in rising awareness, education, higher adoption of technology, higher health and potency, reduced dealings prices, higher market efficiencies. Extent of mobile phone usage for disseminative agricultural info in African country is high, particularly in phone occupation, receiving decision and listening to radio for agricultural functions.

Mobile phones are getting a lot of and a lot of necessary in agricultural extension services. during this regard, information regarding information wants and seeking behavior of farmers, the extent of usage of movable for accessing agricultural info, the interaction between movable and radio and factors constrictive the employment of ICTs area unit crucial. These also are necessary for mobile phones and alternative ICTs to be used expeditiously to facilitate agricultural extension services (Deribe.K, 2016). Effective information and information management within the agricultural sector are achieved once the correct information {and info|and knowledge|and data} is delivered to the farmers and alternative stakeholders at the correct time in an exceedingly easy and accessible manner("Promoting ICT based mostly agricultural knowledge management," 2012).

The main challenges inhibiting the employment ICT in disseminative agricultural information and information, which incorporates the low level of access to ICT infrastructure and services, got to be addressed ..

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5 RECOMMENDATION

Generally the proposed mobile based crowdsourcing system will provide an aggregated and summarized market price information to any user by accepting an SMS message from the crowd which provides an agro market information.

- The regime ought to encourage course of study, making awareness, giving trainings for farmers permits them to use mobile phone and find a lot of information that may facilitate them to increase their production. it's suggested to approaching educated and senior folks to distribute the data and upbringing on movable utilization. this is often the time to move from discussing straightforward mobile distribution, affordability and accessibility to completely different mobile applications.
- The agriculture ministry once coming up with ways for effective and economical use of portable for scattering agricultural info, they need to contemplate those known factors of portable usage.

6 ATTEMPT OF THE WORK

Besides designing a new mobile based crowd sourcing agro market information system architecture, we have the following contribution:

- The study has created a system that can be implemented using the existing SMS messaging service.
- The study has successfully combined mobile based crowdsourcing with information extraction.
- The study has implemented ontology based information extraction on SMS messages.
- The study has showed that crowdsourcing can be used to exchange market price information in a collaborative manner.

7 FUTURE WORK

As a future work, we recommend the following works to be done in the future as additional investigation and implementation to improve the performance of the proposed system.

The execution of dynamic ontology, so that new products and places can be added to the ontology and increase the information extraction process.

- Using Natural Language Processing along with ontology approach in order to increase the performance of the information extraction process.
- Using Multilingual Ontology to process SMS messages written in various language.
- Implementing the system to be used by all type of mobile phones, not only java based mobiles but also android based and IOS based mobile phones.

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DIETARY HABITS, BODY MASS INDEX, AND PHYSICAL FITNESS OF ATHLETES: A BASIS FOR PROPOSED TRACK AND FIELD PROGRAM

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ABSTRACT

This study was conducted to determine the possible relationship among dietary habits, body mass index, and physical fitness of athletes. To achieve the purpose of the study, the descriptive-correlational research design was used. Fifty-four athletes from the Province of Pampanga who competed in the Central Luzon Regional Athletic Association (CLRAA) in the School Year 2019-202 served as respondents of the study. Results revealed that dietary and body mass index have significant relationship to the physical fitness of the athletes. Based on the findings, it is suggested that a continuous dietary awareness program should be implemented, unfit athletes should be closely monitored, and coaches and trainers should design and implement effective health and skills related programs for the athletes' welfare.

Keywords: Body Mass Index; Correlation; Dietary Habits; Physical Fitness; Student Athletes

INTRODUCTION

The government, through the Philippine Sports Commission (PSC), has adapted since 1992, Sports-for-all as a national policy and program. Sports-for-all is a sports program that allows the involvement of all Filipinos regardless of sex, religion, age and capacity. This guideline attracts non-government and government organizations to take on sports (Castro 2012). Moreover, the 1987 Philippine Constitution Article XIV Section 9 states that (1) The State shall promote physical education and encourage sports programs, league competitions, and amateur sports, including training for international competitions, to foster self-discipline, teamwork, and excellence for the development of a healthy and alert citizenry; and (2) All educational institutions shall undertake regular sports activities throughout the country in cooperation with athletic clubs and other sectors. In the education sector, sports are part of the BEC and K-12 curricula support the mandates suggests a continuous monitoring of students in their physical development from elementary level to tertiary. Sports should not stop after schooling but should be promoted in higher level such as intramural, division meet, regional meet, and Palarong Pambansa in order to carry out students' active participation in sports. The abovementioned directive can only be realized if well-built program for sports had been voted for by the academe. Potential athletes in sports should be monitored and given proper training to be totally developed. Developing athletes entails a lot of perseverance, hard work and proper guidance. Another consideration is monitoring the athletes' dietary habits, body mass index, and physical fitness. Moreover, the importance of dietary intake to athletes most especially during training has been stressed over the years. Taking of adequate nutrients from foods, both in quantity and in quality and the body's capability to utilize them appropriately to meet its metabolic needs of health and fitness describes the concept of nutritional status. Body mass index is a measurement of general health and is based on height for weight ratio. The ideal body weight of an athlete depends on a number of different factors, which mainly revolve around the type of sports one plays. In many sporting activities, for instance, being lighter and leaner is beneficial, whereas in other sports, the higher the body mass index and the more muscle an athlete's carries the better. Assessing the demands body mass index of sports helps improve performance. Athletes' competitors in endurance sports are typically light, carry little body fat and have lower levels of muscle fat. The less weight on athletes have to carry, the easier it is for his muscles and cardiovascular system to sustain the energy needed for you to maintain speed over a longer distance. There is a direct link between body mass index height to weight ratio and speed in distance runners. The lighter the athlete, the better they perform. The same applies in any endurance sport, such as doing a triathlon, cycling and long-distance swimming. Being heavier has its advantages, particularly in strength and power on contact sports. Being heavier and carrying more muscle increases power to weight ratio. This can improve power and strength. When it comes to strength sports, such as power lifting, Olympic lifting or strongman competitions, as get heavier; there are natural increases in strength (Samuels, 2016). Finally, physical fitness is one of the main factors for an athlete's success. It has been notice that a high level of the elements of physical fitness such as body composition, cardiovascular endurance, muscular endurance, flexibility, agility, balance, coordination, reaction time, and speed is useful and effective in achieving success in different sports. To assist the Division of Pampanga Sports Development to plan sports and health program in order to mend the dietary habits, nutritional status and physical fitness of student athletes. Hence, this study was conducted to establish the correlation of dietary habits, nutritional status, and physical fitness of athletes.

OBJECTIVES

This study focused on the correlation of the dietary habits, body mass index, and physical fitness among athletes in the Province of Pampanga. Specifically it sought to answer the following question.

1. How may the dietary habits of the athletes be described in terms of consumption of liquids, vitamin and mineral supplement, food intake, dieting, and skipping meals?
2. How may the body mass index of the athletes be described in terms of underweight, normal, overweight, and obese?
3. How may the physical fitness of the athletes be described in terms of health-related fitness and skill-related fitness?
4. Is there a significant relationship among the dietary habits, body mass index, and physical fitness of the athletes?
5. What activities may be proposed to enhance the track and field program of the athletes?

LITERATURE REVIEW

Dietary Habits

Samuelson (2000) stated that food lifestyles are categorized by irregular meal pattern. Skipping breakfast and school lunch were practiced by numerous adolescents. Taking light snacks and meal are very frequent, contributing 25-35% of daily energy intake. Two factors are linked to the dietary habit of the adolescent. Smoking is associated to their dietary habits as well as socio - economic status. Dietary expenditure of vitamins and minerals are sufficient for normal health growth. In addition, Daniels (2004) cited in his work that adequate and quality diet provides increase amount of energy which could sustain longer physical activity among individuals. Meanwhile, Bull (1992) stated that adolescents and young adults adopt eating patterns which may well form the basis of their dietary habits for much of their lives. At the same time, this section of the population can come under considerable pressure from the world at large, to conform to the current trends in fashion, language, behavior, or foods. Moreover, Paugh (2005) specified that the dietary practices of athletes can hurt their performance in the long run. By not getting the right foods athletes will not be able to reach top performance. Some of the common sources of intake that athletes are encountering are: fast food restaurants, quality of food, eating on the run, and the service of the food. Likewise, Nogueira, and Da Costa, (2005) quoted that endurance athletes have negative energy balance, low intake of carbohydrate, adequate to high intake of protein, and high intake of fat. In addition, Rodriquez, Di Marco, and Langley, (2009) Stated that carbohydrate and protein intake must be met during times of high bodily movement to sustain body weight. Physical activity can be affected by body weight and body composition. Meanwhile, Student athletes are left with very little time to meet their nutrition needs. These athletes tend to grab the easiest on the go food for their meal. Little do they know that this lack of nutritious food affect their performance. Student athletes need regular well balanced meals and snacks to maintain the high energy demands of training for competition Reid (2003).

Body Mass Index

The nutritional status of children in the Philippines is caused by a host of interrelated factors-health, physical, social, economic and others. Food supply and how it is distributed and consumed have an impact on nutritional status. In addition, Whitehead, (2012) states that a Filipino nutrition research institute (FNRI) surveyed the nutritional status of selected Filipinos, the survey found out that the prevalence of underweight children less than five years old stands at just 20%, while the total of overweight children is 4.3%. A total of 35% of adolescents between 10 to 19 years are stunted, while seven in every hundred were found to be obese. Moreover, Assistant Secretary of Health Flores (2015) noted that more Filipinos, especially adults are becoming fat. Among adults 20 years old and above, the prevalence of overweight and obesity increased from 16.6% in 1993 to 31.1% in 2013. Women tend to be fatter than men with the prevalence at 34.4% for females and 27.5% for males. Use of weight for height as a measurement of obesity, the waist and circumference and height waist hip ration among adults has also been increasing. The same trend noted among preschooler and school age children. Overweight and obesity prevalence among children is at 5% while among teenagers it is at 8.3%. Analysis of the 2013 nutritional status survey result showed that children who belong to wealthier families tend to be more overweight and obese than those coming from poorer household.

Physical Fitness

Physical fitness is the measurement of the lungs, heart and muscles both during exercise and while at rest. Typically, fit individuals have endurance and lower stress when compared to unfit individual. Basic factors that influence potential include the age, genetic inheritance, sex, eating patterns and level of exercise. Moreover, Caspersen, Powell, Christenson, (1985) stated that physical fitness is the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure-time pursuits and to meet unforeseen emergencies. A number of measurable components contribute to physical fitness the most frequently cited components fall into two groups: one related to health and the other related to skills that pertain more to athletic ability. The health related fitness is (a) Body composition, (b) Cardiovascular endurance, (c) Muscular endurance, (d) Flexibility, (e) Muscular strength. And the skill related fitness is (a) Agility, (b) Balance, (c) coordination (d) power, (e) Reaction time, (f) Speed. The health and skill related components of physical fitness are important to athletic ability.

RESEARCH METHODOLOGY

This study, made use of descriptive correlational design to determine if the respondents' dietary habits, body mass index, and physical fitness are associated with each other. Purposive sampling was adopted to determine the sample size of the respondents. This sampling technique was used since the researcher only included athletes of the track and field team. The questionnaire was

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organized into three parts. Part I included body mass index and the formula in solving the body mass index (BMI) or the Quetelet index and its classifications adapted from International Reference Standard (IRS). Part II of the survey focused on the dietary habits of the athletes. This part adopted from Marino (2001). Part III of the survey contained the physical fitness test categorized into health –related and skill-related fitness. This portion was adopted from the Department of Education physical fitness manual introduced by Dr. Aparicio H. Mequi, former Chair, Philippine Sports Commission (PSC) and Director, Bureau of Physical Education and School Sports (BPESS).

RESULTS AND DISCUSSIONS

1. The Dietary Habits of the Athletes

The athletes' dietary habits are described in terms of their consumption of liquids, vitamin and mineral supplement, food intake, regularity of meals.

1.1 consumption of liquids

The highest computed mean of 3.74 was recorded by the athletes' frequency of drinking water; a mean of 2.31 was posted by the respondents' frequency of drinking carbonated beverages. Adequate and regular water consumption of the athletes has numerous health benefits. Water helps the body well hydrated, which is essential because almost of the cells in the body need water to function properly during training (Baher, 2014).

1.2 vitamin and mineral supplement

The athletes indicated that they take vitamin and minerals **often**. Adequate amounts of vitamins and minerals aid in the normal healthy growth of an individual.

1.3 food intake

The food intake of the athletes in all categories in the food pyramid had means of 3.30 (eating three base meal daily); a mean of 3.22, bread, cereals, pasta, potatoes, or rice; 3.04, fruits; 2.80, vegetables; 2.76, dairy products; 2.81, berry jams, cookies, candies, or other sweets; 2.52, snacks like potato chips, cakes, candies, donuts or soda; 2.59, snacks like yogurt, popcorn or fruits; and 2.59, fast food.

1.4 dieting

The respondents reported that they **sometimes** recorded what they eat, with a mean of 2.20; likewise, they go on diet (2.20) and sometimes seek out nutritional information (2.20).

1.5 skipping meals

Eating breakfast and skipping meals each obtained means of 3.30 and 2.39, both with the descriptive equivalent of **sometimes**, this implies that athletes miss eating breakfast; at other times they miss eating lunch or dinner.

Table 1. Dietary habits of the athletes

Statement	Mean	Std. Deviation	Interpretation
A. CONSUMPTION OF BEVERAGES			
How many times do you drink water?	3.74	0.52	Always
How many times do you drink carbonated beverages? **B. VITAMIN AND MINERAL SUPPLEMENTS**	2.31	0.99	Often
How many times do you take vitamin supplements?	3.09	0.87	Often

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How many times do you take mineral supplements? **C. FOOD INTAKE**	3.30	0.88	Often
How many times do you eat three base meals per day?	3.30	0.82	Often
How many times do you eat breads, cereals, pasta, potatoes, or rice?	3.22	0.88	Often
How many times do you eat fruits, such as apples, bananas, or oranges?	3.04	0.97	Often
How many times do you eat vegetables, such as broccoli, tomatoes, carrots, or salad?	2.80	1.00	Often
How many times do you eat dairy products such as milk, yogurt, or cheese?	2.76	0.75	Often
How many times do you eat berry jams, cookies, candies, or other sweets?	2.81	0.93	Often
How many times do you snacks on foods like potato chips, cakes, candies, donuts, or soda?	2.52	0.91	Often
How many times do you snack on foods like yogurt, popcorn or fruits?	2.87	0.73	Often
How many times do you eat fast food? **D. DIETING**	2.59	0.77	Often
How many times do you record what you eat?	2.20	0.89	Sometimes
How many times are you on a diet?	2.20	1.05	Sometimes
How many times do you seek out nutrition information? **E. SKIPPING MEALS**	2.20	0.90	Sometimes
How many times do you eat breakfast	3.30	0.88	Sometimes
Based on three meals per day, how many times do you skip at least one meal per day?	2.39	1.09	Sometimes

Legend:

3.50 – 4.00 Always 5-7 times a week 8 and above glasses of water
2.50 – 3.49 Often 3-4 times a week 6-7 glasses of water
1.50 – 2.49 Sometimes 1-2 times a week 4-5 glasses of water
1.00 – 1.49 Never Does not occur at all 3 below

2. The Body Mass Index of the Athletes

The athletes' nutritional status by differences of body mass index classification based on height for weight is shown in Table 1. They are classified as underweight, normal, overweight, and obese. The highest mean height of the athletes was 1.70 meters, while the lowest mean was 1.54 meters; minimum height was 1.40 meters, and maximum was 1.79 meters. In weight, highest mean was 86kg, while the lowest was 39.26kg; minimum weight was 30.00kg, and maximum was 88kg.

The mean body mass index of the athletes is described in the following:

2.1 Underweight

The lowest mean of the athletes' body mass index was 16.35; this means 23 athletes were classified as underweight.

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2.2 Normal

A mean of 19.56 or 27 athletes was described to be normal.

2.3 Overweight

The mean body mass indexes of 30.66 means 2 athletes were overweight.

2.4 Obese

The body mass index (BMI) mean of 29.06 means 2 athletes were classified as **obese**.

Overweight and obese athletes were those that play, throwing events that require higher body mass in order to execute muscular performances. A specific requirement is needed in specific sports and to the position that the player has in a particular sport. Throwing event competitors cannot afford to be underweight like sprinters, jumpers, and middle and long distance runners.

Table 2. Body mass index of the athletes

Classification		Height(meters)	Weight(kg)	BMI
	N	23.00	23.00	23.00
	Mean	1.54	39.26	16.35
UNDERWEIGHT	SD	0.09	5.57	1.24
	Minimum	1.40	30.00	12.82
	Maximum	1.78	52.00	17.98
	N	27.00	27.00	27.00
	Mean	1.60	50.22	19.56
NORMAL	SD	0.09	6.66	1.17
	Minimum	1.47	40.00	18.03
	Maximum	1.79	63.00	23.12
	N	2.00	2.00	2.00
	Mean	1.69	83.00	29.06
OVERWEIGHT	SD	0.06	4.24	0.46
	Minimum	1.65	80.00	28.73
	Maximum	1.73	86.00	29.38
	N	2.00	2.00	2.00
	Mean	1.70	86.00	30.66
OBESE	SD	0.02	2.83	0.81
	Minimum	1.68	84.00	30.09
	Maximum	1.71	88.00	31.23
	N	54.00	54.00	54.00
	Mean	1.58	48.09	18.96
Total	SD	0.10	13.10	3.67
	Minimum	1.40	30.00	12.82
	Maximum	1.79	88.00	31.23

The Physical Fitness of the Athletes

A. Health - Related Fitness

Table 3 reveals the test results on cardiovascular endurance of the athletes. Data shows the highest computed mean of 118.33 or 15 athletes whose physical fitness was described as **above normal**. In addition, 79.73 or 15 athletes were found to be in the **needs improvement** category, On the other hand, athletes' minimum heart rate was 60.00 beats per minutes while the maximum was 132.00 beats per minute. Fit athletes can persist in physical activities for relatively long periods without undue stress. Cardiovascular endurance is the most important aspect of fitness.

Table 3. Cardiovascular endurance of the athletes (Heart rate, Minute)

Scale	N	Minimum	Maximum	Mean	Std. Dev.
Needs Improvement	15	60.00	91.00	79.73	9.48
Below Normal	9	72.00	96.00	89.33	8.86
Normal	15	91.00	110.00	100.67	5.07
Above Normal	15	107.00	132.00	118.33	8.62
Total	54	114.54	139.67	1.01	110.00

As per the results of athletes' muscular endurance tests, Table 4 this shows that the highest computed mean was 24.89. This means that 18 respondents had an **excellent performance**; 15 athletes with **high performance** (.00); 14 athletes described to have **very high performance** (13.29); and 7 athletes had **very low performance**, with a mean of 15.14. On the other hand, athletes' minimum muscular endurance was 5 push-ups, maximum was 40 push-ups. Athletes with excellent performance, high performance, and very high performance possess strength and endurance of the upper body muscles which they need to perform activities continuously for long periods without becoming tired. Apparently, athletes with very low performance cannot sustain the long-continued contraction of the muscles, resulting to fatigue.

Table 4. Muscular endurance of the athletes (Number of push-up made)

Scale	N	Minimum	Maximum	Mean	Std. Dev.
Low Performance	7	10.00	23.00	15.14	3.93
High Performance	15	10.00	20.00	.00	4.22
Very High Performance	14	5.00	23.00	13.29	4.08
Excellent Performance	18	16.00	40.00	24.89	6.79
Total	54	5.00	40.00	18.46	6.96

Table 5 shows that the highest mean flexibility of the athletes was 66.50, which means that two (2) athletes had **advanced** flexibility, 51.29 or 14 athletes were **proficient**, and the lowest was 29.11 or 9 athletes were classified as **beginner**. In addition, the minimum flexibility of the athletes was 9.00 centimeters and a maximum of 72.00 centimeters. To achieve peak performance, athletes must utilize the full length of muscles to exhibit power and strength. If muscles are too tight, they may not be able to provide the explosiveness necessary for a particular movement.

Table 5. Flexibility of the athletes (Sit-and-reach, centimeter)

Scale	N	Minimum	Maximum	Mean	Std. Dev.
Beginner	9	9.00	36.00	29.11	8.07
Developing	14	33.00	42.00	37.64	2.50
Approaching Proficient	15	39.00	57.00	45.73	5.15
Proficient	14	40.00	58.00	51.29	5.46
Advanced	2	61.00	72.00	66.50	7.78
Total	54	9.00	72.00	43.07	10.40

Table 6 reveals that the highest mean of the athletes' muscular strength was 46.20. This means 25 of the athletes were found to have **excellent performance**. In addition, 17.25 or 8 athletes were found to have **very low performance**. Whereas, the minimum muscular strength was 4.00

curl-ups and the maximum was 90 curl-ups. Athletes with excellent abdominal strength and endurance can exert against resistance. It can help to push, lift, pull, jump, twist, turn, and bend. Having muscular strength and endurance can keep a person from getting tired easily.

Table 6. Muscular strength of the athletes (Number of curl – ups made)

Scale	N	Minimum	Maximum	Mean	Std. Dev.
Very Low Performance	8	4.00	22.00	17.25	6.14
Low Performance	5	17.00	27.00	20.60	4.62
Normal	13	20.00	32.00	25.69	5.36
High Performance	3	35.00	35.00	35.00	0.00
Excellent Performance	25	20.00	90.00	46.20	15.68
Total	54	4.00	90.00	33.98	16.46

B. Skill – Related Fitness

The skill – related fitness of the athletes is determined by their agility, balance, coordination, power, reaction time, and speed.

As shown in Table 7, the shuttle run tests were used to assess the agility of the athletes. The highest mean score of the test was 19.16; meaning 2 athletes had a **developing** agility. In addition, 17.80 or 24 athletes, 17.48 or 28 athletes whose agility are described as **approaching proficient** and **proficient,** respectively. Moreover, the minimum agility of the athletes was 16.00 seconds and the maximum was 19.40 seconds. An athlete with better agility has the ability to change position in space with quickness of movement, which is a relevant skill in the success of the athletes.

Table 7. Agility of the athletes (Shuttle run, seconds)

Scale	N	Minimum	Maximum	Mean	Std. Dev.
Developing	2	19.11	19.20	19.16	0.06
Approaching Proficient	24	17.06	18.78	17.80	0.52
Proficient	28	16.00	19.40	17.48	1.22
Total	54	16.00	19.40	17.69	0.99

The balance of the athletes was assessed through the stork balance stance test. A table 8 show that the mean score of 30.00 implies that one (1) athlete was described to be **proficient**. Moreover, 4.34 or 53 athletes were classified as **needing improvement.** The minimum balance of the athletes was 1.03 seconds and the maximum was 30.00 seconds. Movement is essential to perform any daily task. Our ability to move efficiently requires control of the body’s postural alignment. In order to move efficiently strong balance is needed. Lack of balance, such as walking, jumping, running, and throwing would be extremely challenging to perform. Balance and stability are key drivers of athletic performance. They increase the athlete’s center body gravity, allowing body to produce force and strength and make more precise movements. Having both balance and stability ensures an optimal level of performance (Harper, 2016).

Table 8. Balance of the athletes (Stork balance stand test, seconds)

Scale	N	Minimum	Maximum	Mean	Std. Dev.
Needs Improvement	53	1.03	12.44	4.34	2.49
Proficient	1	30.00	30.00	30.00	.
Total	54	1.03	30.00	4.82	4.28

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Table 9 shows that the paper juggling coordination test obtained the highest mean score 21.55, indicating that 47 athletes were described as **excellent**. In addition, 2.00 or 2 athletes were described as **poor**. Furthermore, athletes' minimum coordination was 2.00 times hit the paper and the maximum was 56.00 times hit the paper. Well-coordinated athletes also display good timing. Zetou, et al. (2012) proves in their study that coordination abilities are the most important skills for athletes.

Table 9. Coordination of the athletes (Paper juggling, number of times athlete hit the paper)

Scale	N	Minimum	Maximum	Mean	Std. Dev.
Poor	2	2.00	2.00	2.00	0.00
Below Average	2	3.00	4.00	3.50	0.71
Above Average	3	5.00	5.00	5.00	0.00
Excellent	47	5.00	56.00	21.55	12.79
Total	54	2.00	56.00	19.24	13.37

As shown in Table 10, the highest mean score of athletes' power was 5.75. This suggests that 22 athletes were described as **needing improvement.** The lowest mean score was 1.56 or equivalent to 8 athletes described to be **approaching proficient**, and 2.00 or 12 athletes classified as **advance**. Moreover, the minimum power of the athletes was 1.10 meters while the maximum was 2.77 meters. The better the power of the athletes, the better their physical performance. According to Gariartr (2012), power is an important factor influencing physical performance, an attribute may have extra greater influence on physical performance.

Table 10. Power of the athletes (Standing long jump, meters)

Scale	N	Minimum	Maximum	Mean	Std. Dev.
Needs Improvement	22	1.10	96.00	5.75	20.16
Beginner	4	1.62	1.83	1.75	0.10
Developing	3	1.27	1.89	1.60	0.31
Approaching Proficient	8	1.31	1.96	1.56	0.25
Proficient	5	1.41	1.95	1.59	0.25
Advanced	12	1.51	2.77	2.00	0.35
Total	54	1.10	96.00	3.38	12.84

Reflected in Table 11 are the mean scores of the athletes' reaction time. The highest mean was 18.24 or 14 athletes described to **need improvement**, and the lowest was 2.50 or 4 athletes described as **advanced**. On the other hand, the minimum reaction time of the athletes was 2.00 inches and the maximum was 22.00 inches. Reaction time is an inherent ability, but overall response can be improved by practice. Coaches need to analyze the type of skills and requirements of specific sports. Young, et al. (1999) stated that reaction time had a significant influence on the success of Taekwondo athletes. Moreover, Heler, et al. (1998) found a connection between reaction time and the competitive performance of each competitor. Cho (1988) believed that exercise could contribute to an improvement in reaction time.

Table 11. Reaction time of the athletes

Scale	N	Minimum	Maximum	Mean	Std. Dev.
Needs Improvement	14	2.30	22.00	18.24	5.19
Beginner	12	13.00	15.00	13.67	0.89
Developing	11	10.00	13.00	11.45	0.93

Approaching Proficient	8	7.00	9.00	8.50	0.76
Proficient	5	4.00	6.00	4.60	0.89
Advanced	4	2.00	3.00	2.50	0.58
Total	54	2.00	22.00	11.97	5.65

The speed of the athletes was assessed through the 50-meter sprint. Table 12 shows the highest mean score was 8.77 or 6 athletes were described to **need improvement**, followed by 8.14 or 8 athletes described to be **developing**, and the lowest was 6.99 or 6 athletes described to be **advanced**. Moreover, the minimum athletes speed was 6.74 seconds and the maximum was 9.11 seconds. Speed is the ability to perform a motor skill as rapidly as possible. It is the ability of the athletes to move quickly, which is an essential quality in track and field sports. Young (1999) stated that speed has a significant influence on the success of athletes.

Table 12. Speed of the athletes (50 Meter Sprint, seconds)

Scale	N	Minimum	Maximum	Mean	Std. Dev.
Needs Improvement	6	7.31	9.11	8.77	0.72
Beginner	1	7.85	7.85	7.85	.
Developing	8	6.90	8.80	8.14	0.74
Approaching Proficient	16	6.79	8.16	7.58	0.50
Proficient	17	7.28	7.76	7.50	0.16
Advanced	6	6.74	7.40	6.99	0.31
Total	54	6.74	9.11	7.71	0.66

The relationship among the Dietary Habits, Body Mass Index, and Physical Fitness of the Athletes

As reflected in Table 13, the computed p-value of .019 for flexibility shows that there is a significant relationship between body mass index and dietary habits.

In addition, with a computed p-value of .010 for muscular strength, .009 for agility, and .002 for coordination all mean that there is a significant relationship between body mass index and flexibility. Furthermore, as computed p-value of .010 for flexibility, and .034 for coordination show that there is a significant relationship between body mass index, and muscular strength. Meanwhile, as computed p-value of .009 for flexibility, .000 for speed shows significant relationship between body mass index, and flexibility. Moreover, as computed p-value of .002 for flexibility and .034 for muscular endurance show significant relationship between body mass index and coordination. Finally, a computed p-value of .000 for agility suggests a significant relationship between body mass index, and speed.

Table 13. Relationship among the dietary habits, body mass index, and physical fitness of the athletes

	Control Variables		Flexibility	Muscular Strength	Agility	Coordination	Speed
	Dietary Habits	Sig. (2-tailed)	.019*				
	Flexibility	Sig. (2-tailed)		0.10*	.009*	.002**	
BMI	Muscular Strength	Sig. (2-tailed)	.010*			.034**	
	Agility	Sig.	.009*				.000**

		(2-tailed)					
	Coordination	Sig. (2-tailed)	.002**	.034*			
	Speed	Sig. (2-tailed)			.000**		

THE PROPOSED PROGRAM

Results of the study revealed that there is a relationship among the dietary habits, body mass index, and physical fitness of the athletes.

The following programs are:

1. One month meal plan to improve the body mass index of the athletes
2. Track and field programs to improve the flexibility, muscular strength, muscular endurance, agility, coordination, and speed of the athletes.

CONCLUSIONS

1. The dietary habits of the athletes indicate that some are amiss in taking vitamin supplements; food intake; and have a tendency to skip meals.
2. The body mass indexes of the athletes manifest a case of overweight, obese, and underweight.
3. Results of the athletes' physical fitness test show above normal muscular strength, high flexibility, and proficient muscular strength. However, some are unfit in terms of reaction time, power, and speed.
4. Body mass index and dietary habits are significantly related to flexibility, muscular strength, agility, coordination, muscular endurance, and agility.
5. A program for track and field was developed to enhance the athletes' performance.

RECOMMENDATIONS

1. There is a need to continuously promote the importance of having proper dietary habits among athletes because what they eat and how they eat are the sources of their strength and energy needed to perform their daily tasks and responsibilities as athletes. Since the primary sources of nutrition information of athletes are their parents, coaches, and trainers, it is important that these people are knowledgeable enough to give reliable and concrete information regarding nutrition.
2. The schools in the Division of Pampanga, which commonly administer body mass index tests, are prime sites for identifying high-risk student athletes. This study calls for development of effective preventive strategies for all unfit athletes who are at high risk for being underweight, obese, and overweight.
3. Coaches and trainers should design and implement training programs for improving health and skills-related fitness of the athletes' and perform their assessment according to the situation of athletes' fitness level.
4. The coaches and trainer should design programs that will enhance the training of athlete's health and skill-related fitness.
5. The proposed activities to enhanced track and field program of the athletes

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THE SOCIETAL IMPACT OF MALCOLM X SPEECH (A CRITICAL DISCOURSE ANALYSIS)

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ABSTRACT

The paper reveals the Critical Discourse Analysis (CDA) of the famous speech of Malcolm X. who was a leader of Black people in America from1925 - 1965. The title of speech is the "Ballot or the Bullet" It is studied in socio-political perspective. Fairclough Model of CDA is used to carry the study. The paper scrutinizes the way Malcolm managed to communicate spirit of insurgency and the need of revolution also the way he conveyed ideological meaning proving he as an icon leader against racial discrimination and a strong resistance against White people of America.

Key Words: Critical Discourse Analysis, Fairclough, Racial Discrimination, Hegemony, Dominance, Inequalities

1. INTRODUCTION

Since the time immemorial human being has been seeking knowledge through his sense, game of power and the lust of supremacy has created divisions between the races and ethnic groups. This differences promoted and element of abhorrence on the earth and inclined the scholars to explore the question of peach. Since all the mankind is created by one God then why there have been arising the problems of inferiority and superiority and the issues of racial discrimination. It is a fundamental right of every human being to live in peace without being estimated by the difference of complexion. The hegemony has become the most important issue for the debate during the last centuries. It is the worst problem that destroyed not only the peace of a single person on earth but the peace of the billions or even countless people living on the earth.

Many articles and researches have been produced to investigate the social practices led to such type of discrimination all around the world. But the problem of racial discrimination has been the most prevailing and penetrating in the USA during the last centuries. With the observation of historical context, a study is carried to see how the prominent American figure X Malcolm inculcated the curse of superiority concept into the minds of oppressed people.

Malcolm X has been a prominent American leader who stood as the influential force to create awareness about civil rights among Black people. Advocating the Blacks as `rightful ´ physically and mentally, he struggles to draw Black's attention to prevalent unfairness in America. His socio-political discernment fostered his aim and he joined the "Nation of Islam".

This drive of Muslims contained concepts which brought together the vision of Blacks and Muslims one forum. It began in 1930. Putting his energy for the concepts of race, he rose as an influential force to challenge the pride of White Americans. To comply, he led a Civil Rights Movement. The famous poet Amiri Baraka along with number revolutionists (1967) considers that Malcolm is the picture of all Black people of the World. In his poem "A poem of Black hearts'' he says" *´Strong in his image of ourselves.'*

'Image 'of Malcolm symbolizes the dignified and powerful representation of the whole black community. His popularity in the social circle of America can be observed from the poet. Means, the Black people in America actually iconize the political figure of Malcolm as a symbol of African-American masculinity, prestige and self-conscious.

Peniel E. Joseph March 31, 2020, in New York Times, gave his views on the movement, he said, the era in America from 1954 to 1965" has been marvelously combatted by X Malcolm. He reasonably argues that Malcolm X these years, King and Malcolm X directly impacted the thoughts of Black-Americans, Malcolm and Martin Luther King these two persons obtained the clear impression of the conditions of America and they timely came in the game of politics to tell about the right and wrong.

(March 31, 2020, in New York Times)

X Malcolm orated historical words in his speech on April 3, 1964 at in Cleveland, these words efficiently contributed to critical discourse studies. The speech flourishes for the study in the field of linguistics. Key features both the power and ideology of the speaker are taken for consideration. The important features of Critical Discourse Analysis are concern with the contextual meanings of language.CDA Model of Fairclough is determined by many aspects such as how it is prompted, the objectives of its users, their intended meanings, the purposes beyond the use, and the association it holds with other texts.

Discourses are influential due to their serving of production and reproduction unevenness power relations among the civilizations, social strata, sexes, different stages of ages, and occupational groups.

In the paper it is assessed that how the Malcolm attempted to speak against the hegemony of White people against the Blacks applying the language and how he went to inculcate his ideology and themes in the thought of the Blacks who were oppressed socially and politically.

1.1 Research Questions:

1. How does the application of textual/stylistic strategies reflect the view of the Black American community in speech?
2. To what extent the ideology of X Malcolm has been reflected with the help of linguistic choices?

1.2 Literature Review

For this part of study opinion and thoughts of scholars and researchers have been discussed to support the paper.

Fairclough (1988) presented his study for the analysis of text as critical language study. The main idea was to discover the discrimination of social relations and discursive practices which exploits the rights of masses with the help of language used in society. He argued that language is used as an instrument for functioning the power and hegemony. Gee (1990) and Sampson (1990) describes the CDA in a way that it creates the understanding of discourse, applying different approaches. Socio-political as well as the economic matching parts was also considered. Analysis is based more on social semiotics keeping in view the social factors in the specific context.

Fairclough (1989) Van Dijik (10997) see the CDA as the linguistic approach in relation to the exposition of matters concerning language power and ideology for the way ideology communicates ideology and encodes power.

The term cohesion means, in the syntax aspects the sense is made in the text (Baker & Ellece, 2011). Cohesive devices comprise forms of reference such as ellipsis, replacement, cohesion of lexis, conjunction and the substitution (De Beaugrande and Dressler, 1981).

Text structure related to discuss in large-scale organizational, which is interactional control that means concern turn-taking, the selection and change of topics, the control of the agenda and how interaction are established and finished.

Basically, interactional control talks about in oral speech genre that can display about the power relations that are being developed across the order of sentence and phrases.

Political Discourse has achieved much popularity with regard CDA study, it is due to the reason that all discourse taken into consideration as political (Shapiro, 1981).The topics of power, conflict, control, and harmony are being carried for examination in political discourse. Infect, the global emerging scope of political discourse includes all persons and institutions that work in political settings to attain political objectives. This type of achievement meets language choice which manipulation for specific political goals.

1.3 Research Methodology

A careful study is carried applying the framework presented by Norman Fairclough (1992). Text includes the practices of society in culture and discursive practices in society. CDA analysis text as analyzable socio-economic and political factors influences the practices of discourse in the society.

Critical analysis is taken as theoretical framework of this study. CDA shows the social-political exercises like authority, exploitations, domination and ill-treatment of the suppressed one. The title exposes variables as the social, cultural and political disproportion and ideology which are the main subjects.

The data for the study was taken from the famous speech of nationalist leader of Blacks in America ´Malcolm X`. The title of speech is ´Ballot or the Bullet`.

The speech is the representation of emotions and demands by the blacks living in America specific paragraphs have been selected for the study.

Qualitative research method is applied to look for the hegemonic behavior and discursive practices of the Whites towards the Blacks.

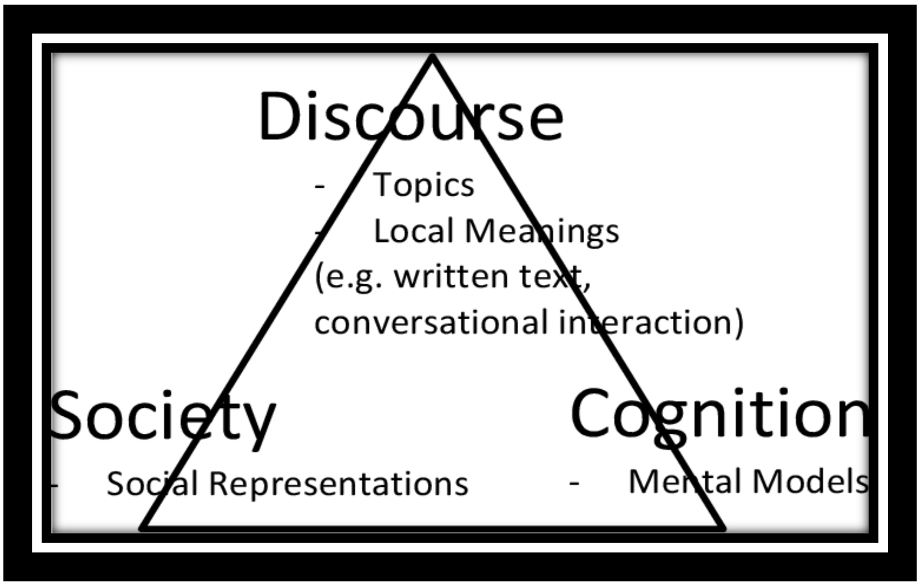

Figure-01: Tri of CDA Model

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2. DISCUSSION AND ANALYSIS

From the speech "Ballot or the Bullet" certain paragraphs that are (4, 8, 6, 23, 26, 49) have been taken for the study. Fairclough approach lightens the dimensions as it provides the sketch of linguistic features used in the text. It also interprets the links of that specific text in the interactions. Finally it reveals the relation of communication with the socio-political variables.

2.1 Analysis of the Background of Malcolm X

a) His Imprisonment and Rise as a Leader

X Malcolm was an African American Muslim minister. In America, African American refers to the ethnic group of Americans who have their forefathers from Africa. These people are known as enslaved descendants. X Malcolm was the leader for these Black people. He was a human rights activist. He had been a leading figure for the civil rights Moments in America also spent good time for the "Nation of Islam". By the American government he was charged for being involved in illegal political activities and penalized for the 10 years imprisonment in 1946. Two charges were launched against him; Larceny and Burglary. In prison, he joined the party the Nation of Islam. This imprisonment gave him fame and as he got paroled in 1952, he became the most influential leader for Blacks, started promoting the black empowerment, question of separation of Black and white Americans, he voiced for the desegregation and demanded the equal opportunities for all.

In 1960, he performed Hajj and became a Sunni Muslim. He left the Nation of Islam with a formal public announcement and inaugurated a Islamic Muslim Masque which is famous as MMI.

During 1964, threats of death were sent to him, On February 19, 1965, X Malcolm told in an interview that he was receiving threats. On 21 February the same year when he was just about to give speech at Audubon Ball stage, a man came out of audience and shot him in his chest.

b) Analysis Of The Political And Social Context Of His Speech

According to Rotney S. Tashaka (2015), ´Ballot or the Bullet` was especially for the Black youngsters of America because the new generation was reluctant to accept the hegemony of White people. The speech was admired by the large number of people, scholars, and suppressed nations of world because it talked about the depression of the rights and freedom of Blacks. People were categorized on their physical appearance rather the content of their characters. They were made classes as into native, colored, Indian or white as Posel (2001) described..

Realizing the torment behavior of white Malcolm told to unify all the Blacks against White rulers but the approach of Malcolm was on the aggressive grounds as it clearly opposes in his speech from time to time;

"Anytime you have to rely upon your enemy for a job, you're in bad shape. [applause] When you — and he is your enemy." You wouldn't be in this country if some enemy". (X Malcolm) (paragraph 18)

"They've become dissatisfied. And all of this has built up frustrations in the black community that makes the black community throughout America today more explosive than all of the atomic bombs the Russians can ever invent". (paragraph 33)

In New York Vining (2011), it is stated that the idea of Malcolm became culturally than a finely understood as a historical figure. In the social circles a large number of the people and groups have estimated their imaginations, ideas and dreams.

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2.2 Text Analysis

Text analysis is linked the analysis of the language applied in the real situation by one member or of one group. It contains the cohesion, coherence, lexical choices and stylistic features which highlights specific themes and broader socio-political perspective of the speaker.

Two divisions are made for the analysis. For the first part, statement and clauses expresses the ideology.

For the second part, sentences and clauses are analyzed in relation with each other to focus on types of thematic development.

There is a progress of series of theme, rheme on the basis of known and new information. This pattern makes the sentences well-arranged for the speech it also leads to cohesion and coherence in the text. The unity of grammar focuses information for structure.

The message of orator is considered through the feelings. Sentences are persuasive with logical ideas. The organization of new and given information for making the speech is effective. Mark and unmark theme work as a tool to capture new discourse collectively. There is a chain of ideas finely developed. The vocabulary focuses the core ideas. Listeners are well intact and motivation is inculcated in the audience to get freedom from the slavery. Continuous theme style targets the organization of deep emotional impact upon the listeners. There is a repetition of words and sentences by the speaker.

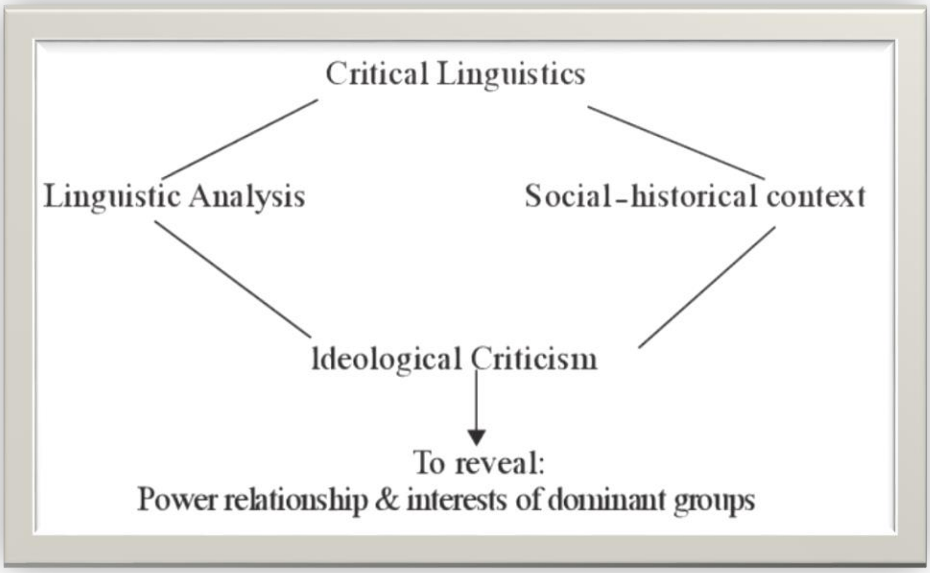

Figure-02: Textual Relationship of Speech

2.3 Analysis of Themes Addressed in Speech

Here the ´Ballot or Bullet` very clearly announces the message that now the Blacks have become much irritated by injustice of White rulers, It provides the most powerful representation of Black`s Ideology.

In the 4th paragraph of speech it is very clearly stated, *´I am a Black Nationalist freedom fighter”* (Paragraph 4).

The discourse reveals that it is a struggle for the Black Americans for getting basic rights of the Blacks. *´Black men should control the politics`* (paragraph 6) It states neither the social nor the political identity was given to the Black`s. Hence, the theme of nationalism is introduced.

Malcolm provides that audience with the spirit of progression. Actually wants to raise the social status of the Blacks. A true picture is portrayed as what is the actual position of Blacks in the eyes of whites. As stated in American poetry by Amiri Baraka (1965) "For Malcolm ´heart raising us above our filthy cities`. Means the Black people were called as the lowest class with no importance.

Amiri Barakav(1965) states that the area of black were ´´filthy cities`` But X Malcolm reawaken the sleeping blacks to revolt for achieving their equal participation in the services of the country.

´If you and I are going to live in a black community`(X Malcolm) (Paragraph 8)

Malcolm shows the moral blindness of the whites. Blacks were forced to serve as slave and were assigned the lowest category jobs.

´We will always be misled and astray`` (Paragraph 9).

The discourse reveal the loss of identity and loss of dignity. It states that in the legal papers segregation in USA had ended before 50 years. Yet in many parts of America people from different races cannot go to same school, they cannot shop at the same store, and they don't have the same services. Mostly the blacks were enforced to live either on country sides or in the tenements.

2.4 Repetition

According to (Kech 1996) repetition in linguistic means the copying of same previous unit in a text for instance a word, phrase or a sentence.

1)....... Black nationalism, the only way you can get involved in the civil rights struggle...... (Paragraph 23)

2) .... to black nationalist, those whose philosophy is black nationalism.... (Paragraph 26)

3)........ Black nationalism means ´give it to us now, don't wait for the next year` (paragraph 26)

Here the phrases black nationalism has been used 17 times repeatedly. It shows that it has been too long for the blacks being dominated and terribly ignored by the state rulers and the Whites. There is an open call of insurgency against the state government.

The deprivation of rights and thrust for having a reasonable part in the land can be seen.

2.5 Parallelism

Parallelism influences the grammar structure sentences but can impact the meaning of thoughts and ideas being presented. It is regularity over syntax. It actually balances the items of sentence which are equal in grammar. Malcolm X makes an impressive rhythm by applying parallelism to assist the listeners to go through bottom of ideas.

1) ..... If we own the stores, if we operate the business……..... (Paragraph 49)

Malcolm used the noun "Freedom" 8 times. It very clearly reveals that the chief themes are freedom and inequality in the socio- political perspective. The pronoun as ´We` is used 167 times, "You" is used 308 times, and the adjective 'racial'' is used 8 times.

This creates the attachment between the speaker and audience. A strong bondage is systematically increased between the listener and audience.

2.6 Metaphor

Metaphor is a thing that is the representation or a symbol of something other.

"If you were black, you were born in jail" (Metaphor)

Metaphor of a jail is applied to uncover the experience of African-Americans live in a barbaric system of enslavement and agony.

2.7 Rhetoric, Imagery and Cohesion

Politicians apply rhetorical devices to communicate intended meaning and ideologies. According to Robert A Harris (2019) rhetorical device is a technique that a speaker uses to communicate the audience a meaning with a good of persuading them towards considering a topic from a perspective, applying language intended to motivate or provoke an emotional demonstration of given perspective or action.

Flowerdew (2002) and Pinto (2004) state the question based on rhetoric do not find answers. Those are indirect methods to convey the meaning.

1....... "Ballot or the Bulle"t.

"Ballot or Bullet" is a complex rhetorical development.

According to Charland (1987), there is dream of equality, radically redrawing the ideological boundaries of Americans.

Managerial rhetoric is used. It is the most poignant and militant statement. It drew the attention of mass electronic and printed media. Establishment was a direct target in the rhetoric invoked the violence and bloodshed but for a positive and a true cause and for the sake of fundamental human rights.

"The Ballot or the Bullet" also designates a change in Malcolm X's rhetoric, as his departure from the "Nation of Islam" and new, liberated public involvement gave a change in the ways he delivered his listeners. Malcolm X kept his use of repetition as "*communications of the passion* which is fulfilled by a single sentence, but that someone who has indulged the seeds of the land of America, (paragraph 38) and this can be cleared by his continuous application of the phrase "*the ballot or the bullet*".

Besides, Malcolm X decorated the speech by applying imagery and to mask his ideas of society and religion. *"though Islam is my religious philosophy", "my political, economic and social philosophy is Black Nationalism"* (Paragraph 5). In new style he discusses issues into his perception for his spectators and encourages direct action. The most significant change of Malcolm X's rhetoric which can be seen in "The Ballot or the Bullet" is the widening of his audience, as he stresses personalized finding rather than group cohesion. And also allows for more analysis. , As he says "*The economic philosophy of black nationalism" (X Malcolm).*

2.8 Genre and Style

Genre analysis means analysis of text that relates to choices of lexical items applied in speech in socio-cultural context. Speaker's style holds the key important role in the critical analysis of any discourse. The value of expression and its relation with speech is linked with the analysis of speech through personal expression of the speaker as he says *"stipulation wherein whenever"*, *"voter rights*" (Paragraph 55)

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We came to know that speaker was a Negro and so he also suffered same deprivation of rights and worst attitude of the white people. His words are the complete representation of all Negroes. The rhetorical values reflect upon the connection between the speaker and audience. Since he was a part of the same trouble therefore he successfully induces his ideology.

Several times he uses Our, I, and We that state that he considers himself the part of audience. The sentiments are provoked with the help of racial themes.

3. CONCLUSION

The paper presented critical discourse analysis of X Malcolm`s speech ´Ballot or the Bullet`. It was shown that selected speech expresses multiple manifestations through which ideologies are communicated to listeners. The study reveals power, inequality, and ideology's relationship between structures in discourse of organized textual analysis. Malcolm X speech entitled "Ballot of the Bullet" shows contents of meaning of phrases hidden in the speech.

The use of Fairclough (1992) model was kept in practice to analyze the objectives of this study. For the data, the 9 paragraphs were selected from the full speech. This all data of speech focused on one idea that it is about discrimination issues of races in America. The conflicting American ethical problem was highlighted. The oppression by White toward Black people was the key issue to be discussed.

Malcolm's speeches assisted a lot on Civil Right Act as symbolic of Black group.As a result, it is true that Malcolm X delivered his ideology using the power of Black itself for standing up against races of Black people. His speech can stimulate all the Black people to act against discrimination in America.

3.1 Semantically Analysis of vocabulary section

CDA analysis looks for strategies used by X Malcolm for convincing his black ideologies and communicates his meaning to the audience and to the people of America.

According to Soring (1989), in CDA strategies speakers employ to convey their ideologies. Same is applied by the Malcolm to communicate his intended meaning.

1) You would never found - you cannot open up a black store in white community.

2) White man will not patronize you.

3) We should own and control economy of our country.

These above lines contain the artful selection of phrases and words.

1) Black Nationalism (2) we should own (3) we should own (4) never found (5) black store (6) cannot open (7) in white community (8) ever patronize you (9) should own (10) will not ever (11) we should control (12) our country.

The dictions aimed at describing the ill-treatment of the Blacks by the white rulers. The speaker used the pessimistic approach of the ruling class that`s why she shows the negative authoritative role practiced by the government of whites. The words display that the blacks neither politically nor socially given the part in the offices of the country. Malcolm through the uses of words maintains the spirit of awareness for demand for rights. He through his words motivates the blacks to understand the upcoming loss of their generation under the white supremacy. *´ Sense through to look himself`* He conveys that the white are swollen with the unnecessary pride.

´Won`t ever patronize you`

Through the words Malcolm intends that there will never be a legal place for blacks in America.

3.2 Vocabulary Analysis

Noun

1- "By ballots I only mean freedom".

2- "Compromising approach that have been using toward getting freedom".

3- "We want freedom now"

4- "Proclamations to give freedom to the white man".

5- "Supreme court decisions to give freedom to the black man".

6- "If it is a country of freedom".

7- "Let it be a country of freedom".

8- It is not a country of freedom change it.

The word freedom has been used eight times by the speakers. The writer selected the words because it is throughout to be the most appropriate representation for being enslaved in any way. The term challenges the dominance as the America is based on Greenberg theory toward dominance that has frequency of association of string in the world.

It displays the government of USA that the black community, the suppressed people and the deprived people of their primary and secondary rights.

1- To such extent you bleach, to get like one white men.

2- Here the white man are whisking them put you in jail for getting drunk.

The above two sentence reveals the comparison of skin color. In the 1st sentence, the mentality of black is shown that try to get involved in the country without any concern of skin. They want to make relations with Whites but in the 2nd sentence the word ´men` is intended to refer to white men or Americans. The impression is that ´a connotation meaning of white men functions like bad sides. There are no benefits for the blacks as for the whites.

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Appendix

The Ballot or the Bullet by Malcolm X

April 3, 1964

Cleveland, Ohio

EMPIRICAL REVIEW ON FACE RECOGNITION MODELS

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ABSTRACT

Face (expression) recognition (FR) is a very exciting problem in the area of image processing and computer vision. Any FR system should be savvy to unequivocally detect facial images. Several kinds of features have been considered for face (expression) recognition in past years. It is noticed that some of the simple aggregate statistical features have not attracted the researchers for face (expression) recognition problems. In this paper, our contribution is about feature ordering and discussing the ability of distinguishing and non-distinguishing images. This article explores the ability of representing and classifying facial images through some aggregate statistical features such as mean, standard deviation (Std), Coefficient of Variation (Cv), and 7 invariant (spatial) moments.

Keywords: ANOVA, Mean, STD, CV, IM, Post-Hoc Analysis, Invariant (Spatial) Moments

INTRODUCTION

The interest in the face (expression) recognition has been growing greatly during the past two decades due to the need for more secure ways of protecting information for both corporate and federal interests, and many more. With the invention of Digital Camera Technology and Internet Photo Sharing sites, the biometric facial recognition technology is now utilized in everything right from surveillance to targeted marketing. Today, many industries are getting assistance with facial recognition system. Like in taking logs, the official record of events, computer entertainment, virtual reality, multimedia, database retrieval, information security for example. operating system, medical records, online banking., automated border controls, personal security driver monitoring system, Forensic applications, passport, driver's license, the desire to development of human-computer interface (expression)s, interactive movies and games, home video surveillance system.

Computer and telephone companies are providing more layers of biometric security to customers, Law enforcement agencies using face (expression) recognition system to keep the public safer, in the investigation, in identity verification for example, in the year 2011, using facial recognition system confirmed the identity of Osama Bin Laden after he was killed in the USA. theraid, Airports, and metro station authorities improving travelers' security and convenience, big commercial companies have used facial recognition technology to draw attention and promote their sales. For example, in the year 2009, Coca-Cola Zero launched a Facial Profiler App on Face (expression)book that scanned photos for people who looked like you. In the year 2012 Suhas et al (2012) developed a face (expression) recognition system using Principal Component Analysis and Linear Discriminant Analysis.

Automatic facial detection and recognition system is an active research area bridging other disciplines like machine learning, image processing, pattern recognition, artificial intelligence, biometrics and computer vision. This is represented in the Figure 1. Face (expression)

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recognition system is a necessary first step in many applications such as human computer interface (expression), facial expression recognition, and gender recognition [6].

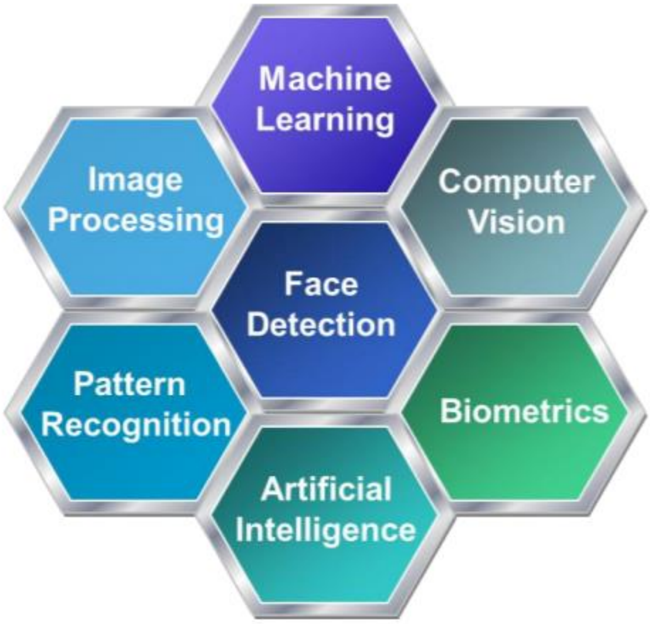

Figure 1: Interconnection of face (expression) recognition and other fields of study

LITERATURE REVIEW

In the late 19th century, Alphonse Bertillon, a police official in Paris, developed a manual database by storing photos of the suspect's full face (expression), profile with name, bodily measurements, and other information. He tried to identify criminals with accurate measurements. He also published guidelines to measure body parts and classified information. This was soon adopted by police worldwide. Later, the law enforcement started using photographs of wanted conspirators onto posters. In cases, where no photo of the suspect was available, the police were dependent on hand-drawing of a suspect's face (expression)Leone (2021).

In 1960, Woodrow Wilson Bledsoe, a pioneer of artificial intelligence introduced semi-automated computer-based facial recognition. He devised a system for manually noting key facial benchmarks on each image like the width of the mouth, the distance between eyes, nose etc. These metrics were inserted into a database. Then, when a new face (expression) photograph of an individual was given, the Bledsoe's system was able to retrieve the face (expression) from the database that most closely matched.

In the 1970s, the researchers Goldstein, Harmon, and Lesk were able to add increased accuracy of manual facial recognition system by including 21 specific key facial landmarks like lip thickness and hair color in order to identify face (expression)s automatically. The Kanade feature-based recognition system developed in1973 is one of the first automated face (expression) recognition systems. A work by Kelly (1970) on visual identification of people by computer related to automatic face (expression) recognition was also carried out at Stanford University.

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In 1980s and 1990s researchers continued working in the field of Biometrics. In 1988, the research by mathematicians Kirby and Sirovich(1990) at Brown University applied linear algebra to facial recognition called Eigen face (expression)s. They were able to show that feature analysis on a collection of facial images could form a set of basic features. They were able to prove that less than one hundred values were required in order to accurately code a normalized face (expression) image. In 1991, computer scientists Matthew Turk and Pentland (1991) at MIT expanded upon the Eigen face (expression)s approach by discovering how to detect face (expression)s within images using technology and environmental factors leading to the automatic facial recognition system.

From 1993 to 2000 the Defense Advanced Research Projects Agency (DARPA) and the National Institute of Standards and Technology (NIST) created a database of facial images. In 2003 the database was updated to include high-resolution images. In 2014 the FBI under state-of-the-art facial recognition technology replaced its old fingerprinting system with the world's biggest biometric database including voice features, palm prints, and even DNA profiles by combing civil and criminal information within one master database. It allowed them to compare the suspect information with a large database of facial images collected from digital camera devices seized under a search warrant, employment background checks, surveillance cameras, mug shots, etc. to find a correct match. The facial recognition system setup consists of advanced cameras that capture photos of people who pose or simply walk by, and sophisticated software working on those pictures will attempt to find the right match from this gigantic database to identify the person(s) in the image. The interest in the face (expression) recognition has been growing greatly during the past two decades due to the need for more secure ways of protecting information for both corporate and federal interests and many more.

PROPOSED MODEL

A randomly selected sample of 10 people images from BioIDFace (expression) Database with labels as given in Figure 2. The following section 1 gives the descriptive statistics of features and identifying the significant features using ANOVA. The number of treatments can be as many as distinct persons in the image pool. The extracted feature data can be viewed as multivariate data with several treatments.

In section 2 the conditional distribution of features/ ordering statistically significant features has been computed and hence an attempt form rule for distinguishing classes. A hierarchical clustering analysis has been carried out in section 3with Post-hoc analysis on each of the features and conclusions discussed.

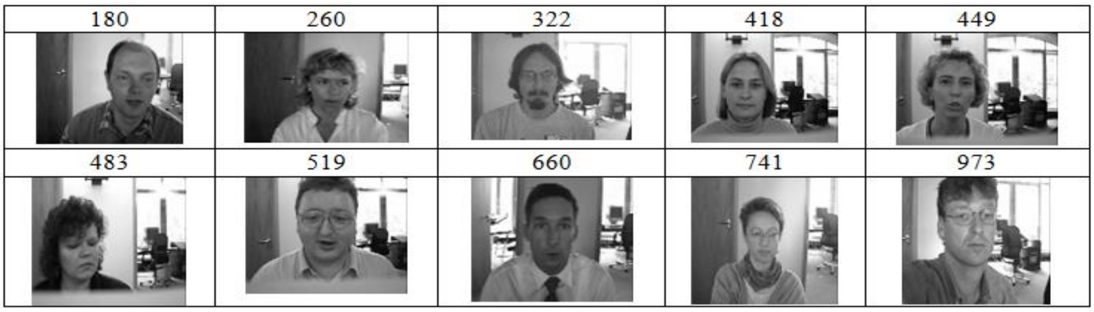

Figure 2: Sample face (expression)s of Selected 10 individuals

Descriptive Statistics and ANOVA

Ten features such as mean, standard deviation, coefficient of variation (Cv) and seven invariant moments IM1, IM2, IM3, IM4, IM5, IM6, IM7 descriptive statistics were extracted from test

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sample of10images. An analysis of variance was carried out on all extracted features by treating image labels as treatments and their feature values as responses to see which of these features is significant.

A detailed descriptive statistical analysis was carried out on this multivariate sample. A sample of descriptive statistics on 4 features is shown in Table 1.

Table 1: Descriptive Statistics Sample of Mean, Std, Cv, and IM1

Descriptive Statistics					
		Mean	std	cv	IM1
N	Valid	445	445	445	445
	Missing	0	0	0	0
Mean:		127.3593933320	66.2959908950	52.6754208830	.00136060037
Std. Error of Mean:		.69235505205	.31009820263	.36009793650	.000007739106
Median:		132.3478839000	66.4615373300	52.7363983200	.00132788600
Mode:		88.52934696[a]	55.50284044[a]	38.97597043[a]	.001135418[a]
Std. Deviation:		14.60524582308	6.54152875075	7.59627429217	.000163256624
Skewness:		-.590	.241	1.213	1.362
Std. Error of Skewness:		.116	.116	.116	.116
Kurtosis:		-.593	-.307	4.427	1.671
Std. Error of Kurtosis:		.231	.231	.231	.231
Percentiles:	10	106.8903645800	56.5492450660	42.9136372860	.00118799580
	20	109.3317617600	60.3117317900	47.2380004020	.00123061540
	25	113.6493162000	61.4752254600	47.6135338250	.00123663550
	30	122.7412114200	62.8173917200	48.5140544940	.00126492640
	40	125.3919398600	64.5046143920	49.9919658780	.00130659320
	50	132.3478839000	66.4615373300	52.7363983200	.00132788600
	60	133.5286713000	68.4346086340	54.8456347160	.00135116780
	70	136.9330073200	69.4104961080	55.6545403880	.00138998880
	75	138.6403109000	70.1546588800	56.3233889750	.00141607000
	80	140.2538880400	71.5579484180	57.4823551700	.00143902980
	90	142.6135744400	74.8565230460	61.6476134700	.00159126880

An analysis of variance is performed onfeature by feature and the results are provided in Table 2 and thenfollowed by their feature distribution Histograms.

Table 2: Analysis of variance of each of each of the feature

ANOVA						
		Sum of Squares:	Degrees of freedom:	Mean Square:	F:	Significance:
Mean:	between groups→	46366.135	9	5151.793	46.355	.000
	within groups→	48344.929	435	111.138		
	total→	94711.063	444			
Std:	between groups→	14433.191	9	1603.688	152.773	.000
	within groups→	4566.279	435	10.497		
	total→	18999.470	444			
Cv:	between groups→	10957.020	9	1217.447	36.117	.000
	within groups→	14663.282	435	33.709		

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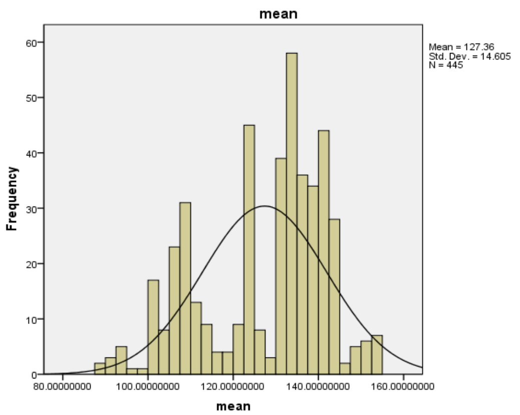
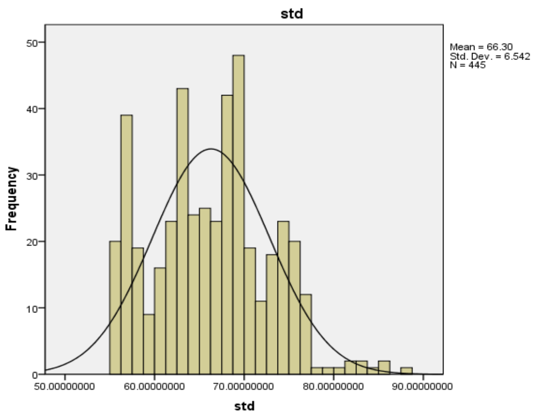
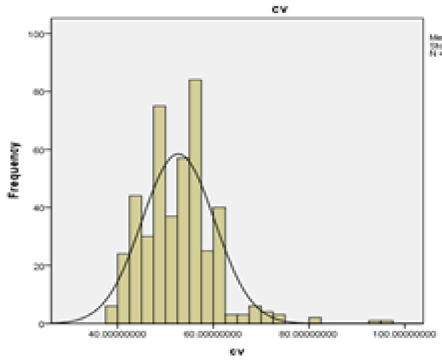
	total→	25620.302	444			
IM1:	between groups→	.000	9	.000	48.996	.000
	within groups→	.000	435	.000		
	total→	.000	444			
IM2:	between groups→	.000	9	.000	120.491	.000
	within groups→	.000	435	.000		
	total→	.000	444			
IM3:	between groups→	.000	9	.000	7.276	.000
	within groups→	.000	435	.000		
	total→	.000	444			
IM4:	between groups→	.000	9	.000	20.291	.000
	within groups→	.000	435	.000		
	total→	.000	444			
IM5:	between groups→	.000	9	.000	3.060	.001
	within groups→	.000	435	.000		
	total→	.000	444			
IM6:	between groups→	.000	9	.000	21.143	.000
	within groups→	.000	435	.000		
	total→	.000	444			
IM7:	between groups→	.000	9	.000	4.715	.000
	within groups→	.000	435	.000		
	total→	.000	444			

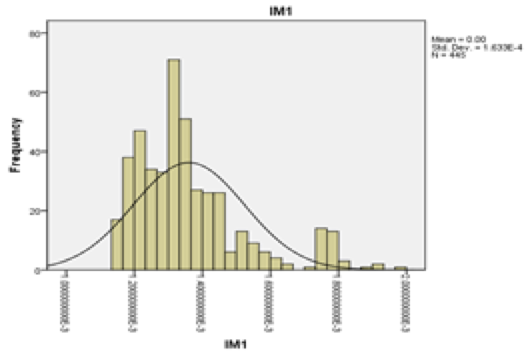
A univariate one-way analysis of variance on the sample image classes for each of the feature in Table 2 shows that the F-statistic is higher and their p value smaller than 0.05 or 0.01. We conclude that the considered features mean, Std, Cv, and the seven Invariant Moments (IM1, IM2….IM7) are significant and they contribute or consist information about the distinguishing facial image classes.

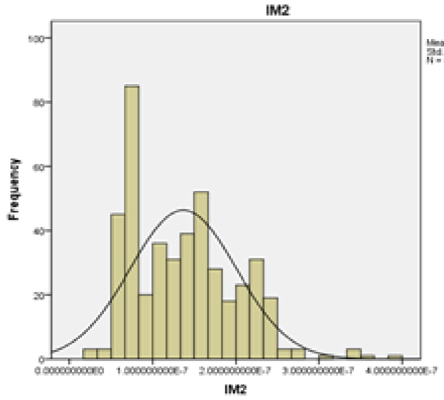
The histograms of features aredisplayed in the following Figure: 3.We see no outliers. All features are roughly normally distributed. The distribution of IM3 and IM4 data is nothing like a normal distribution.

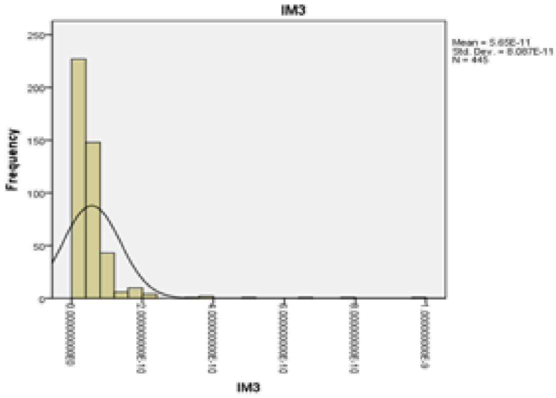


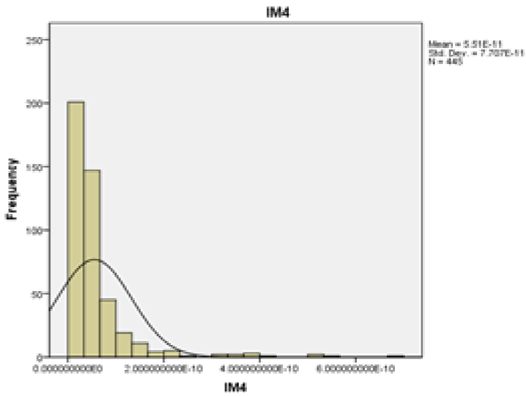


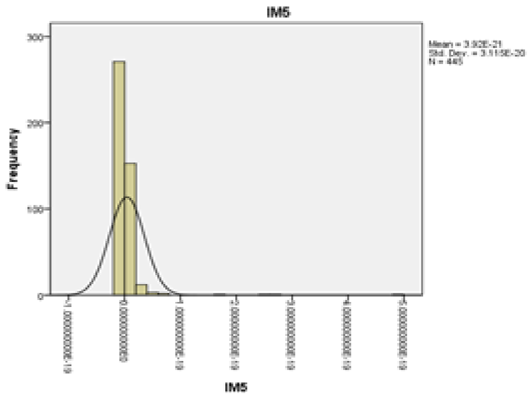

cv
Mean = 52.68
Std. Dev. = 7.596
N = 445
Frequency
cv

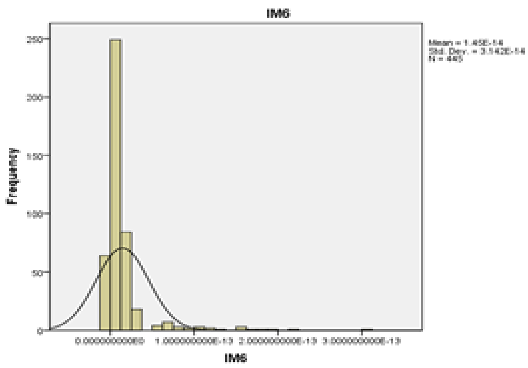

IM1
Mean = 0.00
Std. Dev. = 1.633E-4
N = 445
Frequency
IM1

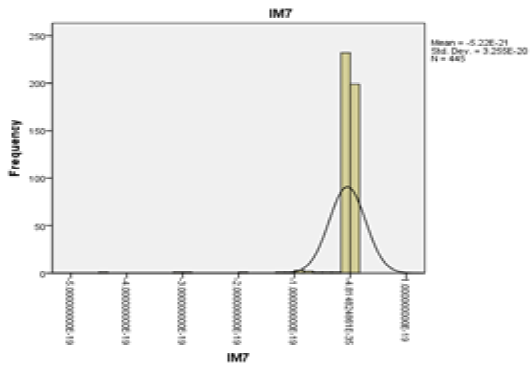

IM2
Mean = 1.37E-7
Std. Dev. = 6.381E-8
N = 445
Frequency
IM2


IM3
Mean = 5.65E-11
Std. Dev. = 8.087E-11
N = 445
Frequency
IM3


IM4
Mean = 5.51E-11
Std. Dev. = 7.707E-11
N = 445
Frequency
IM4


IM5
Mean = 3.92E-21
Std. Dev. = 3.115E-20
N = 445
Frequency
IM5


IM6
Mean = 1.45E-14
Std. Dev. = 3.142E-14
N = 445
Frequency
IM6


IM7
Mean = -5.22E-21
Std. Dev. = 3.255E-20
N = 445
Frequency
IM7

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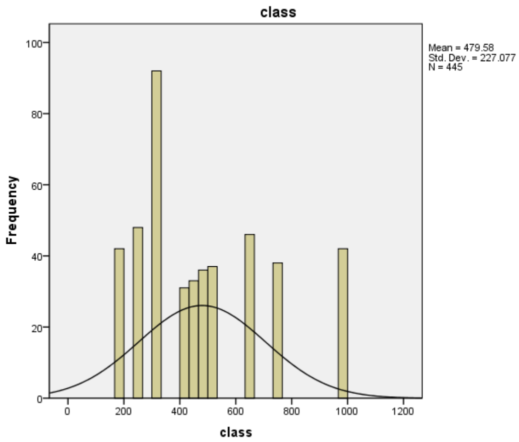

Figure 3: Histograms of features

ORDERING OF FEATURES

The significant features recognised from ANOVA table are arranged in the decreasing value of F statistic. This is the feature ordering. The features are now ranked as given in table 3. Hence, we assume that these features are potential enough to distinguishing and non-distinguishing image classes.

Table 3: Ranked features

Feature name	F-statistic from ANOVA	Ranks
Std	152.773	1
IM2	120.491	2
IM1	48.996	3
mean	46.355	4
Cv	36.117	5
IM6	21.143	6
IM4	20.291	7
IM3	7.276	8
IM7	4.715	9
IM5	3.06	10

The feature with highest F value will be routing into the Image classes distinguishing model first, then the second feature with the next highest F value, and so on.

Post-Hoc Analysis

Post hoc tests are an integral part of Analysis of Variance (ANOVA) and useful to analyze the results of the experimental data. Since all the selected features are significant among 10 image classes, a post-hoc analysis is carried on eachfeature data to see which pair of image classes differ significantly under each feature. A post-hoc analysis is carried out on each feature. A sample of post-hoc pair wise statistics analysis for the top ranked significant feature variable "std" on the image class 180 with each of other classes is given in table 4 below.

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Table 4: Post-hoc test results on feature" std"

Dependent Variable:	(I) Class:	(J) Class:	Mean Difference (I-J):	Std. Error:	Sig:	95% Confidence Interval:	
						Lower Bound:	Upper Bound:
std	180	260	5.60412497738*	0.684562	0	4.258665	6.949585
		322	-3.33141414987*	0.603352	0	-4.51726	-2.14557
		418	-3.11159204208*	0.767172	0	-4.61942	-1.60377
		449	-3.29872666656*	0.753678	0	-4.78003	-1.81742
		483	-10.24388442845*	0.735882	0	-11.6902	-8.79756
		519	3.64732255810*	0.730507	0	2.21156	5.083086
		660	8.00676296579*	0.691472	0	6.647722	9.365804
		741	10.05779259221*	0.725379	0	8.632109	11.48348
		973	-2.43322305262*	0.707012	0.001	-3.82281	-1.04364

We noticed that the "std" has successfully distinguished the class 180 from all other classes. The labelled class 180 is significantly differing with 260,322,418, 449, 483, 519, 660, 741 and 973classes. Thus the feature "std"will contribute information about the image distinguishing andcan be the part of the modelof face (expression) recognition.

Another sample of post-hoc test on the significant dependent variable "mean" discussed below. The class of 180 with all other classes is given in table 5 below.

Table 5: Post-hoc test results on feature" Mean"

Dependent Variable:	(I) Class:	(J) Class:	Mean Difference (I-J):	Std. Error	Sig:	95% Confidence Interval:	
						Lower Bound:	Upper Bound:
Mean:	180	260	-18.15018680446*	2.227444	0	-22.5281	-13.7722958
		322	-19.52397918021*	1.963201	0	-23.3825	-15.6654411
		418	-30.22499182496*	2.496242	0	-35.1312	-25.3187959
		449	-32.01614348723*	2.452335	0	-36.836	-27.1962442
		483	-34.65693781071*	2.394431	0	-39.363	-29.9508464
		519	-25.05634818346*	2.376944	0	-29.7281	-20.3846262
		660	-4.1201	2.249928	0.068	-8.54218	0.301983838
		741	-24.54972619712*	2.360257	0	-29.1887	-19.9107996
		973	-16.78028503095*	2.300494	0	-21.3018	-12.2588187

As we noticed the individual labeled 180, is significantly differing with all other labeled classes except 660. In other words, the feature "mean" is able to distinguish the class 180 from 260, 322, 418, 449, 483, 519, 741, and 973. The images 180 and 660 have the same mean. Therefore, it means there will be some classes with equal mean among the image classes. Thus this feature may not contribute clear information in distinguishing image classes even though is proved to be a significant feature in ANOVA. This feature may be considered in building the model. There is a need to probe further in this direction.

Mean Plotting

A visual display of the feature means plots help us to visualize our results and therefore included them in our write up. We can see increases and decreases in mean values of each feature. For example, in first mean plot of data it shows that label 519 and 741 are not clearly distinguishable with respect to mean of means.

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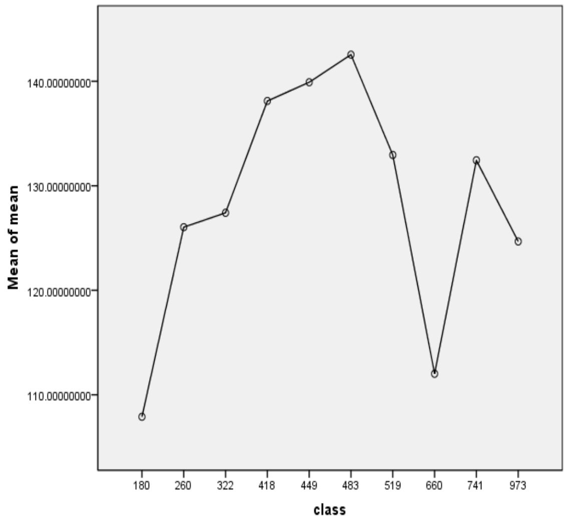

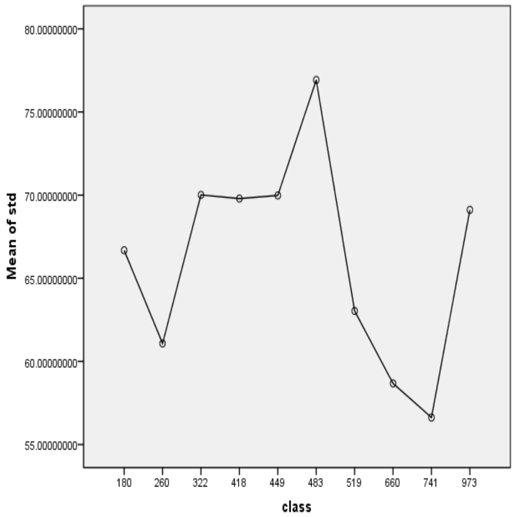

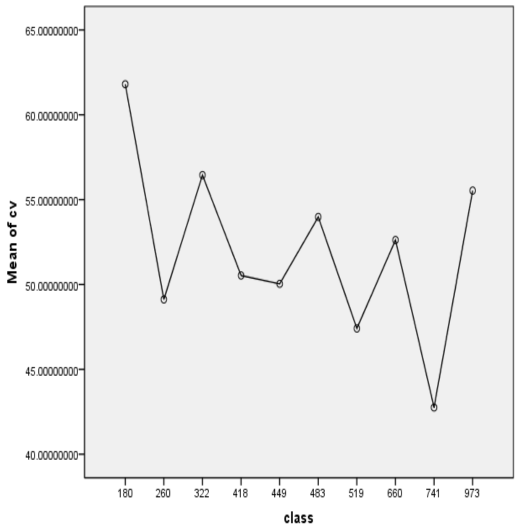

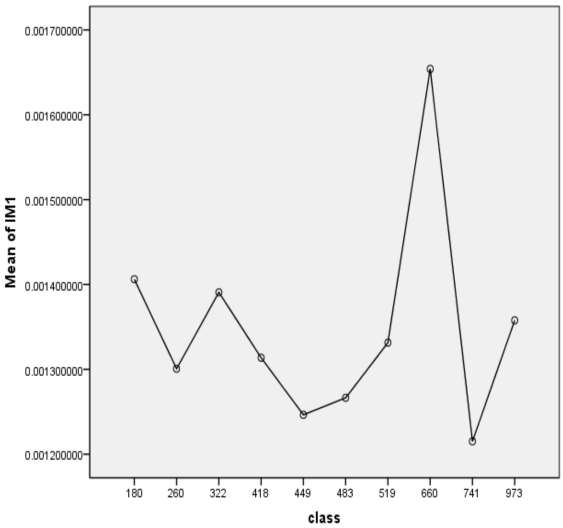

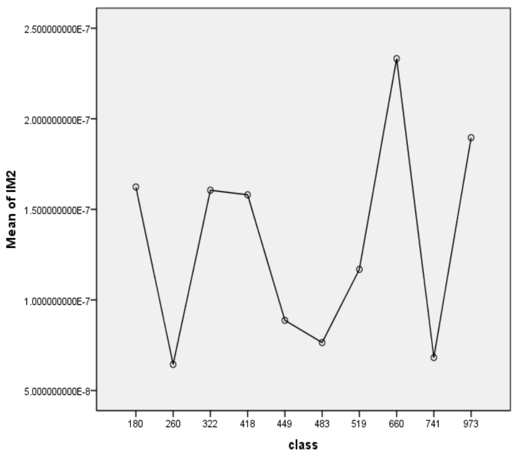

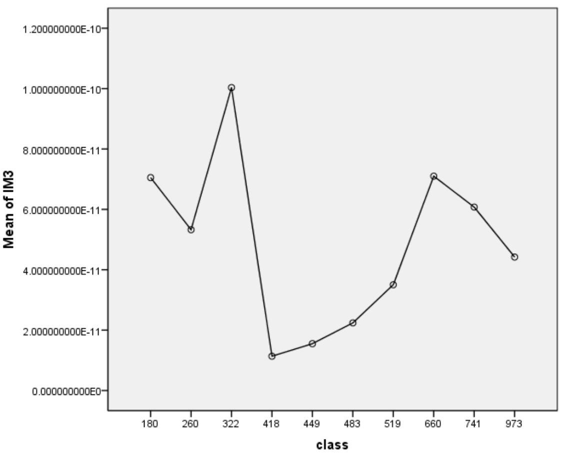

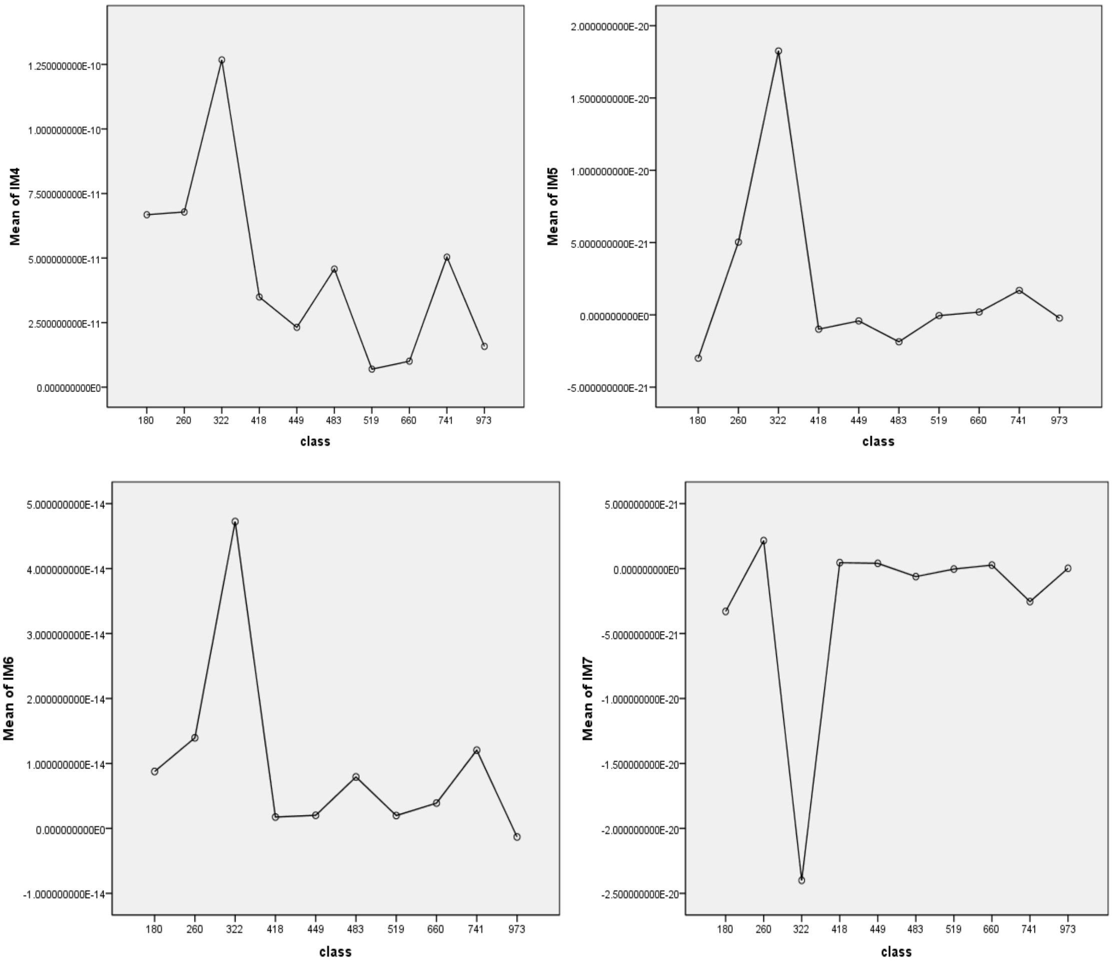

Figure 4: Mean plots of features

We demonstrated the possibility of ordering the features using F-statistics in this article. In our example, the feature “mean” is not able to distinguish two image classes in post-hoc analysis becausethey have the same mean. Thus there is a need to elicit the knowledge to distinguish image classes that do not differ significantly. Thus there is a need for probing additional knowledge to distinguish the image classes. Simply confining to this procedure of extracting significant features for distinguishing the image classes is insufficient.

CONCLUSION

We prove our statistical features significance, not by using axiomatic approach, not by an experimental approach, not by using modeling, or not by simulation approach. We are analyzing and showing using data itself. This is a data science approach. Thus our work in this article starts with the exploratory data analysis on the benchmark BioIDface (expression) data set.

An illustration of the extraction of features, their descriptive statistics on a test sample of 10 images are given. An analysis of variance was carried out on all extracted features to know which of these features are significant. The significant features are then ranked. A post-hoc analysis is carried on each feature to see which pair of image classes differ significantly under each feature. Simply confining to this procedure of extracting significant features for distinguishing the image classes which is insufficient is established in this article.

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AN EFFICIENT QUALITY DRIVEN OF FACE OCCLUSION DETECTION AND RECOGNITION

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ABSTRACT

This paper affords a identify and discover human faces is an photograph irrespective of their position, scale, in-aircraft rotation, orientation, pose, illumination etc. To efficaciously become aware of the individual through surprising the history and different noises within side the photograph. It have to be easy and powerful for the customers and become aware of faces which might be covered with scarf, mask, shades etc, is one of the vital components that influences the overall performance of face reputation. Many algorithms and technology are proposed to clear up the occluded face reputation wherein we use haar cascade set of rules that is simplest one. Initially this set of rules wishes loads of nice pix(pix of faces) and terrible pix(pix without faces) to teach the classifier then we should extract features from it. Facial detection is prompted through readability of the photograph, colored or black and white pix. It can simplest help frontal detection of pix and the education does takes loads of time with a purpose to separate a terrible face from a terrible face from a nice face.

Keywords—Haar cascade, Face Detection, Recognition, nice face, Terrible face.

I. INTRODUCTION

Over the years, several answers to this difficulty had been suggested, starting from breaking the face into a chain of neighborhood areas to superior statistical methods. In the existing paper, we increase the problem as one in every of reconstruction. The elements that degrade the overall performance of a face recognizer encompass presence of illumination differences, intensive pose variations, and facial expressions. This system consists of segmentation, isolation, and validation of facial functions from the risky surroundings and probably actual faces [1][2][3][4].

The system of face reputation incorporates the faces in two fundamental steps, the extraction of the characteristic and the classification. Face reputation is one of the maximum critical issues of verifying and figuring out a face from question or enter picture. This device has emerged has an critical discipline in case of surveillance systems Face recognition is an extremely powerful tool for video surveillance, PC interaction, face reputation management, and photo databases.. It performs a essential position in identity and verification in diverse security based systems. Face reputation is broadly taken into consideration as one of the maximum promising biometric.

Haar cascade may be used to come across any styles of items so long as we've got the proper XML for it. Haar cascade is a system studying item detection set of rules used to pick out items in an picture and primarily based totally at the idea features. It is widely recognized for being capable of come across faces however may be educated to pick out nearly any item. This uses “inner images” standards to compute the “features” detected.

Partial face detection, closing the face, aims to find out the occluded area of the face in a given photo. When the environment and type of occlusion are unknown, facial occlusion management is difficult. First find the occlusion by accident, and then mainly rely on the uncovered part of the face to understand the face. Feature extraction is the important thing approach on this process. A sure variety of functions for every photo are extracted, defining its excessive stage content material data then in keeping with the similarity of these vectors [5].

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Positive snap shots are in which incorporates the snap shots which we need our classifier to become aware of and Negative snap shots are in which incorporates snap shots of the whole lot else, which do now no longer incorporate the item we want to detect.

II. PROPOSED METHODOLOGY

The facial function extraction and class is taken into consideration as a complicated venture within side the face occlusion structures despite the fact that the pictures are taken below managed settings. However, this venture will become extra complicated whilst the advent is affected because of expression or partial occlusion. Hence lots of the paintings at the situation is directed to address function extraction tactics in part occluded or expression version pictures. The architecture is shown in figure 1.

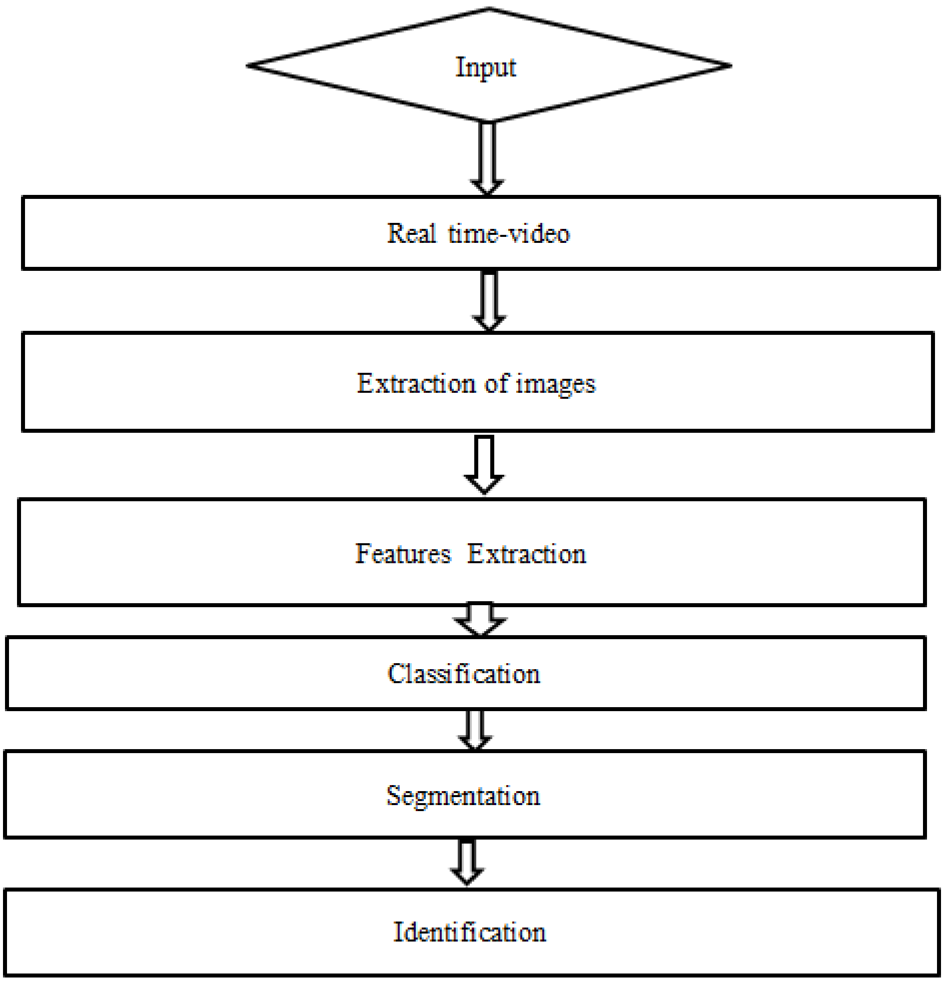

Figure 1: Archieture of face occlusion system

Extraction of images

Feature Extraction: In FAN that have 5 detector layers every related to a selected scale anchor. The factor ratio for anchor is about as 1 and 1.five, due to the fact maximum of frontal faces are about rectangular and profile faces may be taken into consideration as a 1:1.five rectangle. Besides then calculate the facts from the Wider Face educate set primarily based totally at the ground-reality face size.

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To find the variety of occluded faces in education dataset, e.g. Wider Face train is limited and can't satisfy the education of CNN network. Only 16 faces are with fairly occlusion property from the annotation. Thus, endorse a random crop technique that could generate a big variety of occluded faces for education.

Classification: Cascade CNN proposes a cascade shape to hit upon face coarse to fine. MTCNN develops an structure to cope with each the detection and landmark alignment jointly. Beside, face detection has inherited a few achievements from universal item detection tasks. The Faster R-CNN framework to enhance the face detection performance.

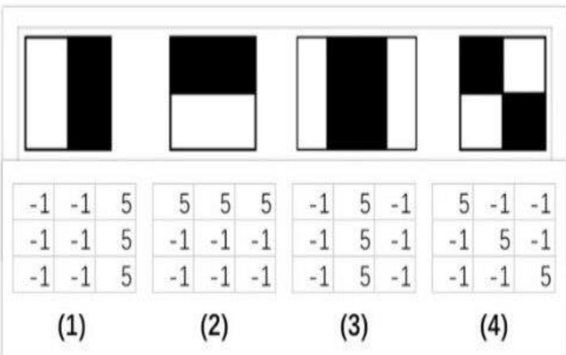
Segmentation: Object detection and segmentation is the most common one critical mission in vision wherein the goal is to permit machines to find out and localize objects. Successful instance segmentation is a building block for masses software program together with self driving cars, robotics and human-computer interaction

Image identification: The face occlusion component, the principle cognizance on whether or not the usage of the reconstructed photos for face occlusion could have a higher end result than the usage of the not locked component 960 normal faces in the experiment photos had been use because inside education adapt examine PCA and LDA projection, 720 faces photos sun shades and 720 faces photos masks had been because the check set.

Data sets: Overall performance, FAN is evaluated throughout more than one face datasets: Wider Face and MAFA. Wider Face dataset: Wider Face dataset consists of 32, 203 pix and393, 703 faces vary greatly in scale, pose, and occlusion. MAFA dataset: MAFA dataset consists of 30, 811 pix with 35, 806 masked faces accumulated from Internet. It Face recognition test for masked face, their faces have widespread diverse orientations and occlusion.

Haar Cascade Algorithm for face recognition: Initially this set of rules desires a whole lot of fine pictures (pictures of faces) and negative pictures (pictures without faces) to educate the classifier.

Then we need to extract capabilities from it. Haar Cascades makes use of the Ada-improve gaining knowledge of set of rules which selects a small quantity of vital capabilities from a huge set to present an green end result of classifiers then use cascading strategies to stumble on the face in an image.



Artificial Neural Networks in face recognition: Represents a neural community based on radial features, including good matrix factorization for facial performance, and uses the neural community back propagation to test faces and language. Use various distance metrics and normalized cross-correlation for face detection to understand the function of a face.

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Face descriptor-based methods: The description of the face image based entirely on local features represents the global description. Therefore, the features of the image community in adjacent pixels are evaluated and then added to form the final global description. This is a global practice assessment that provides a complete picture. To provide each feature, the first step is to define the face created in the pixel diploma and provide useful resources to use each pixel in the common area.

III. MODULES AND ANALYSIS

The software is carried out the project, concept, pattern, design, specification, norm, set of rules or rule is executed. Implementation In different words, the implementation is a software, software program detail or different laptop System programming and shipping of a technical specification or set of rules. For a selected specification or standard, there can be many implementations of face occlusion is shown below figure 2.

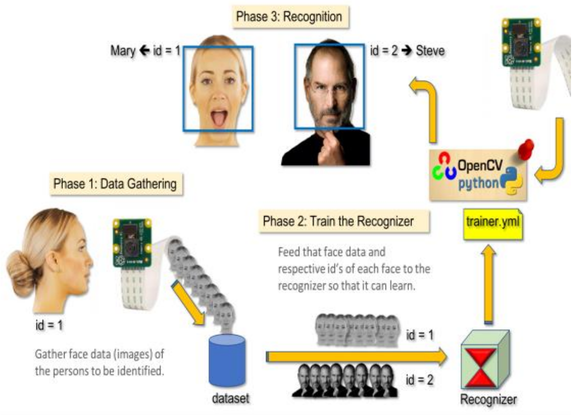

Figure 2: Implementation of face occlusion

Module 1: Data Gathering

The figure 3 explains the Facial recognition records series facilitates in analyzing and evaluating an individual's facial details. A whole method is face detection it locates in addition to detects human faces in movies in addition to images

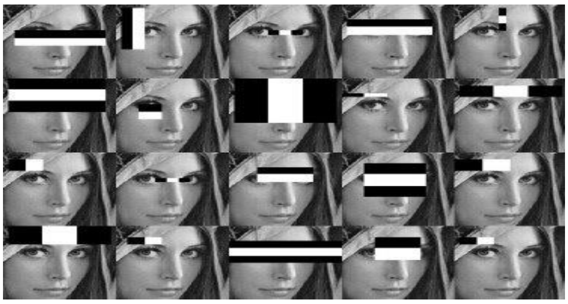

Figure 3: Data Gatherings

Module 2: Training data

The figure 4 gives the all consumer statistics from our dataset and teach the pictures which might be detected, so that it will be stored on a trainer/listing which takes all pictures on listing dataset as enter and it'll be teach all of the pictures

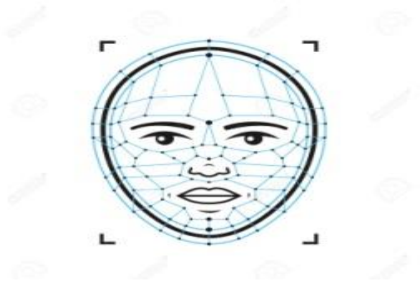

Figure 4: Training Data

Module 3: Face Recognition

We capable of capture a glowing face on our virtual camera and if this man or woman had his face captured and professional before, our recognizer will make a "prediction" returning its identification and an index, validated how confident the recognizer is with this match are shown in figure 5.

Figure 5: Face Recognition

Module 4: Face classification

All Face recognizer are able to serializing and de serializing their inner kingdom to disk. All recognizers also are able to incremental learning. All recognizers/classifiers are times of Face Recognizer. There are multiple default implementations; however the maximum not unusual place is the Face Recognizer which could use any shape of Incremental to carry out the real classification. There also are unique recognisers for the Faces algorithms that may be built with inner recognisers which are shown in figure 6.

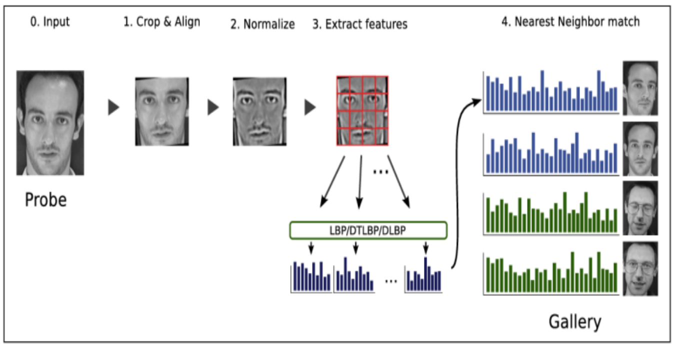

Figure 6: Face classification

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Module 5: Face detection

The easiest mission on Face Recognition is of course, “Face Detecting”. Before anything, you must “capture” a face a great manner to recognize it, even as in contrast with a cutting-edge face captured on future. The most now no longer unusual place way to hit upon a face is using the Haar Cascade .Here we're capable of artwork with face detection. Initially, the set of guidelines needs hundreds of first rate pix (pix of faces) and horrific pix (pix without faces) to educate the classifier and results shown in figure 7.

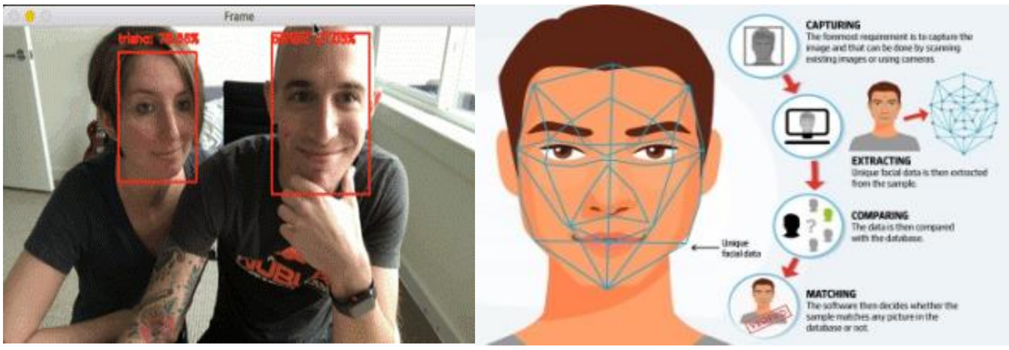

Figure 7: Face detection

IV. RESULT AND DISCUSSIONS

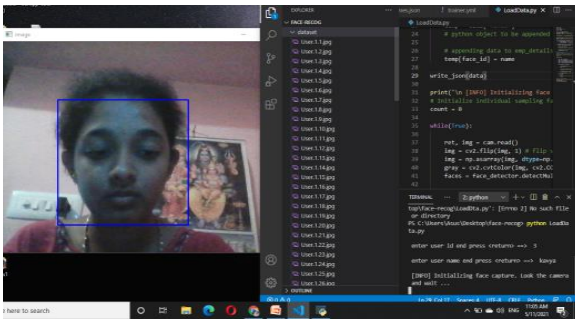

Figure 8: Inserting data into dataset using id and face

Perform the face detection function to detect the presence and position of the face in the image. Extract the feature vector that quantifies each person image .We have noted how OpenCV’s face detection works previously. The model responsible for absolutely quantifying each face in an image is from the OpenFace project, a Python and implementation of face popularity with deep learning

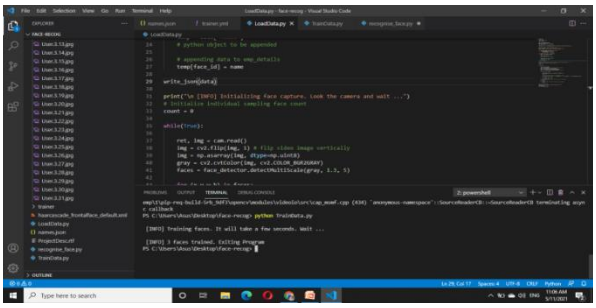

Figure 9: Training the data into the machine

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Creating picture graph of faces and facial expressions as education information for a face recognition software. This way, we offer the person with vital face popularity education information this is used to educate the system. All we want to do is simply create 60 greater cropped pix and not using a face in them. Generating negative (no-face) pix is less complicated than producing positive (with face) pix. Similarly, we created a couple of scaled copies of every picture graph with faces pixels tall, then randomly drew pixel boxes results are shown in figure 8 , figure 9 and figure 10.

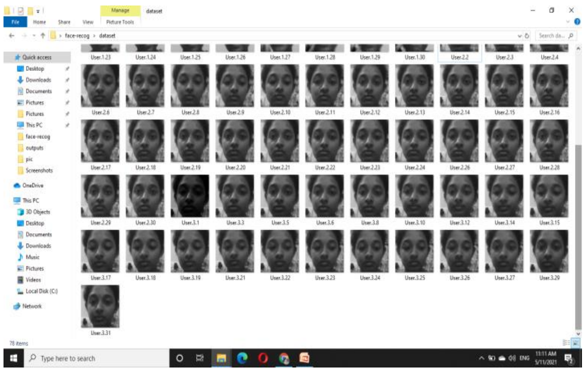

Figure 10: Data stored in the dataset in the project

The very last degree of the pipeline makes use of extracted Facial Features to carry out face recognition (figuring out who is face it is) or classification (figuring out a few function of the face; as an example male/female, glasses/no-glasses, etc).

- Detection - Capturing a face with the aid of using scanning a picture or photographing a person's face in actual time.
- Position - Determining the location, period and attitude of the head.
- Representation - Converting the template proper right into a numerical example of the face

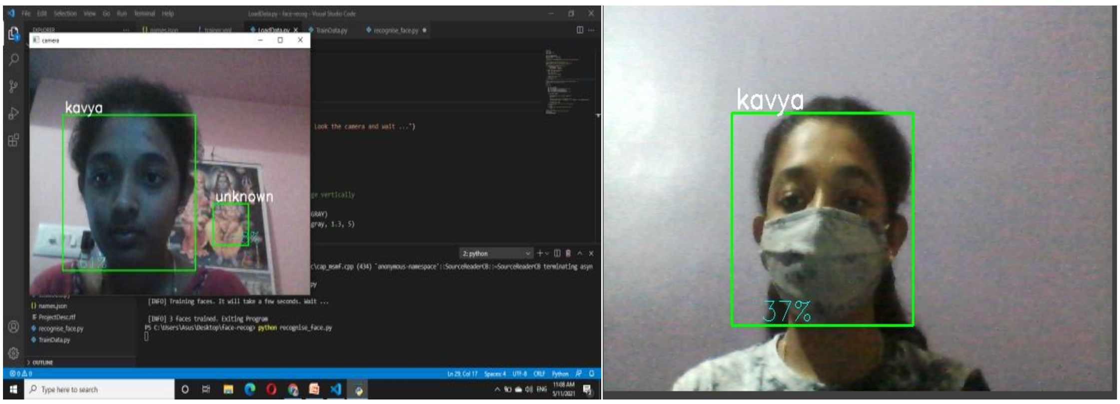

Figure 11: Face recognition with occlusion and without occlusion

It truly approaches that the face detection can perceive that there may be a human face found in an photo of video – it cannot perceive that person. Face detection is a part of Facial Recognition systems – the primary level of facial popularity is detecting the presence of a human face within side the first area and matching the accuracy.. A facial popularity device makes use of opencv to map facial

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Possibility of photography. Compare the record with the database of recognized faces to find a match is shown in figure 12. This is because the popularity of the face has various commercial uses.

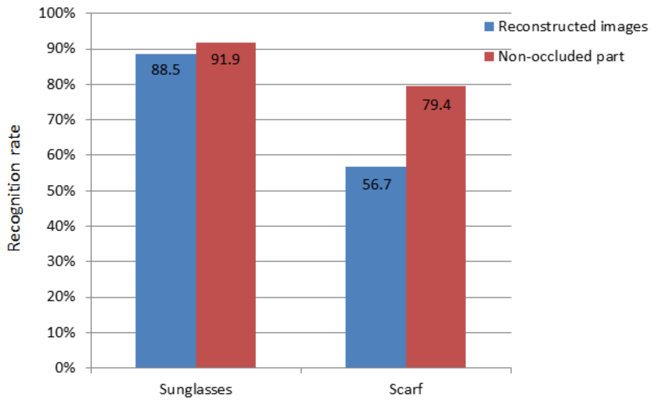

Figure 12: Comparison between occluded and non-occluded

We concentrate on whether using the reconstructed images for face recognition can have a better result for the face recognition component than using the non-occluded component only. In our experiments, 960 normal face images were used as the training set to learn PCA and LDA projection, 720 face approaches to face recognition, examples of AR face database images, some NMR process results of reconstructed images and residual images. Rows 1-3 display examples of raw images, restored images and residual images respectively. The test set was used for 673 images with sunglasses and 720 face images with scarf. Figure 11 demonstrates the effects of LDA approach [6][15][16].

The findings clearly demonstrate that face recognition performances using the non-occluded portion of face images are much higher than those using reconstructed images. Other classifiers, such as NMR classifiers, will investigate the results.

V. PERFORMANCE EVALUTION

In the final twenty years, the computer –primarily based totally occlusion discipline has accelerated rapidly. Several algorithms were delivered and stepped forward to the factor wherein computer systems can rival human beings in accuracy of face occlusion However, over the last numerous year, fundamental enhancements were made to those final analysis algorithm. In a test with the aid of using Alice J.O'Toole, seven face.

In the proposed work the facial characteristic extraction and class is considered as a complex undertaking within side the face occlusion systems notwithstanding the reality that the snap shots are taken be neath controlled settings. However, this undertaking becomes more complex at the same time as the appearance is affected due to expression or partial occlusion. Hence an entire lot of the artwork on the scenario is directed to deal with characteristic extraction techniques in partially occluded or expression model snap shots.

CONCLUSION

In this work describes the module for visual perception and autonomy. First, the technology used in the project and the methods used are explained. Finally, it shows the conclusions, discusses the issues and how they have been tackled, followed by a debate. And when subjects wore spectacles, using Haar-cascades for face detection performed extremely well. The video speed in real time was adequate and devoid of visible frame lag. LBPH combined with Haar-cascades can be introduced as a cost-effective face recognition tool, taking into account all variables. An instance is a device to detect known troublemakers in a mall or store to send the owner a notice to keep him alert or take him into a class for automatic attendance.

This paper presented a new mechanism for partly occluded faces to be reconstructed. In contrast to this reconstruction, we supported the use of the 1-norm and the 5-quasi-norm. We demonstrated the superiority of the suggested method to those documented in the literature in a large number of experimental findings. Our algorithm implementation classifies a new test image in less than a second.

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OPTIMISATION OF MACHINING PARAMETERS FOR MAXIMUM TOOL LIFE

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ABSTRACT

This work focuses on the optimization of Machining parameters using the Taguchi technique to obtain minimum surface roughness (Ra) and maximum tool life (Tl). A number of drilling experiments were conducted using the L8 orthogonal array on a CNC vertical machining center. The experiments were performed on EN-24 steel blocks using uncoated M32 HSS twist drills under dry cutting conditions. Signal to Noise (S/N) ratio was employed to optimize control factors affecting the surface roughness and thrust force. The cutting speed, feed rate and depth of hole were selected as control factors. After the nine experimental trials, it was found that the cutting speed was the most significant factor on the surface roughness and the tool life. The results of the confirmation experiments showed that the Taguchi method was notably successful in the optimisation of drilling parameters for better surface roughness and tool life.

Keywords: Optimization, Machining Parameters, ANOVA, Tool life,

1. INTRODUCTION:

Optimization of the cutting parameters of a M32 HSS twist drill tool was carried out according to the Taguchi and ANOVA methods. The paper deals with the influence of cutting parameters, namely cutting speed, feed rate, and helix angle on the tool life. AISI304 steel with carbide bits. The experiments were designed according to the orthogonal Taguchi arrangement of L8 and the experiments were performed with two levels of cutoff parameters. The effects of the cutting parameters were analyzed by evaluating the vibration amplitude of the drill and the roughness of the surface. A laser Doppler vibrometer (LDV) was used to collect data on-line from drill vibrations and a fast Fourier transform analyzer was used to process acoustic optical emission (AOE) signals. Taguchi methods and analysis of variance were used to identify significant cutting parameters that affect drill bit vibration and surface roughness.

2. METHODOLOGY:

Taguchi's method and analysis of variance are used to analyze experimental data to determine the influence and contribution of the cutoff parameters. In this work two parameters, namely the vibration acceleration of the drill and the surface roughness, are used to estimate the service life. It is used as a powerful tool for analyzing cutting parameters in all applications. In this work, a specially developed Taguchi orthogonal set was used to investigate the effects of all processing parameters with few experiments and less time.

Twist drills with a diameter of 10 mm were used to drill holes in the workpiece. Drilling parameters selected are given in table1. According to the test plan, 8 combinations of drilling parameters were designed and tests were carried out on a CNC machine. The thickness of the workpiece considered in this work was 35 mm.

Table 1. Drilling parameters and levels

Factors	Units	Level 1	Level2
Helix angle (H A)	Degree	25 degree	30 degree
Feed Rate (F)	mm/min	10	12
Spindle speed (S S)	rpm	600	800

The following sequence procedure is used for testing under dry conditions; each test is started with a new drill bit with test conditions (test), and 4 holes are drilled under each test condition. The machine and laser beam are focused on the lathe to measure the vibration signal. After drilling each hole, take out the workpiece and drill bit, and measure the surface roughness (Ra) with Talysurf. The above steps were repeated four times in each test condition to make four holes. The surface roughness (Ra) and acceleration of drill vibration were obtained from 8 trials.

3. ANALYSIS OF SURFACE HARDNESS:

S/N ratios have been calculated with Taguchi technique for floor roughness (Ra) the use of smaller the higher feature and S/N ratios are provided in table 2.

Table 2. DOE results for surface roughness

Exp. No.	Design of Experiments					Surface roughness (µm)			
	H A	F	S S	R 1	R 2	R 3	R 4	MEAN	S/N Ratio
1	25	10	600	2.97	3.86	3.86	6.05	4.1850	-12.7512
2	25	10	800	2.50	2.81	3.12	4.10	3.1325	-10.0724
3	25	12	600	2.52	2.84	3.07	4.10	3.1325	-10.0724
4	25	12	800	2.66	3.08	3.86	3.97	3.3925	-10.7245
5	30	10	600	4.47	5.15	6.10	6.34	5.5150	-14.9128
6	30	10	800	4.08	5.30	5.83	6.09	5.3250	-14.6224
7	30	12	600	4.00	4.84	5.75	6.56	5.2875	-14.6009
8	30	12	800	3.37	4.17	4.54	5.87	4.4875	-13.2181

4. ANALYSIS OF WORKPIECE VIBRATION:

S/N ratios calculated with Taguchi method for acceleration of twist drill vibration velocity using smaller the better characteristic is presented in Table 3.

Table 3 DOE results of acceleration of drill vibration velocity

Exp. No.	Design of Experiments					Acc. (m/sec^2)			
	H A	F	S S	R 1	R 2	R 3	R 4	MEAN1	S/N Ratio
1	25	10	600	0.1254	0.1346	0.1326	0.1218	0.12860	17.8084
2	25	10	800	0.1562	0.1513	0.1600	0.1472	0.15367	16.2631
3	25	12	600	0.1560	0.1515	0.1600	0.1472	0.15367	16.2631
4	25	12	800	0.1800	0.1920	0.2067	0.1711	0.18745	14.5213
5	30	10	600	0.2083	0.2410	0.1668	0.2233	0.21030	13.4712
6	30	10	800	0.1463	0.1551	0.1499	0.1537	0.15125	16.4028
7	30	12	600	0.1460	0.1553	0.1501	0.1548	0.15125	16.4028
8	30	12	800	0.2256	0.2371	0.3930	0.2767	0.28310	10.7298

5. TAGUCHI ANALYSIS:

The Taguchi analyzed the S / N ratio of the surface roughness for a cutting parameter that has the greatest influence on the roughness. The Taguchi results showed that the helix angle has more influence on the surface roughness and is ranked 1st in table 4.

Table 4. Taguchi results for surface roughness.

Level	Helix Angle	Feed rate	Spindle Speed
1	-10.94	-13.07	-13.07
2	-14.31	-12.17	-12.18
Delta	3.37	0.90	0.89
Rank	1	2	3

For a better tool life and machined surface quality, the vibration acceleration of the drill should be lower. Therefore, the smaller is better mode was selected in this analysis. According to the Taguchi results, the helix angle has more influence on the amplitude and is ranked first in table 5.

Table 5. Taguchi results for acceleration of drill vibration velocity

Level	H A	F	S S
1	16.35	17.99	16.38
2	13.28	16.19	15.45
Delta	3.07	1.80	0.93
Rank	1	2	3

6. ANOVA ANALYSIS:

In the ANOVA, the experimental results were evaluated with a confidence level of 95% and the Taguchi S / N ratios were determined. ANOVA also determined the contribution of the individual cutting parameters to the surface roughness. According to ANOVA for the S / N ratio of the surface roughness, the helix angle shows a higher contribution of 79.85%. Here the error was found with 7.65%.

Table 6. ANOVA of Signal to Noise ratio for surface roughness

Source	DF	SS	MS	F	P	% contribution
H A	1	24.439	24.439	10.43	0.019	79.85
F	1	1.689	1.689	0.72	0.152	5.52
S S	1	1.578	1.578	0.67	0.162	5.15
H A*F	1	0.000	0.000	0.00	0.296	0.00
H A*S S	1	0.001	0.001	0.00	0.286	0.00
F*S S	1	0.545	0.545	0.23	0.214	1.83
Error	1	2.343	2.343			7.65
Total	7	30.594				100

The distribution of the S / N relationships on the levels of the cutting parameters is shown in figure below. From the figure, the optimal levels of the cutting parameters are obtained as 25 degrees spiral angle, 12 mm / min forward speed and 800 rpm reel speed.

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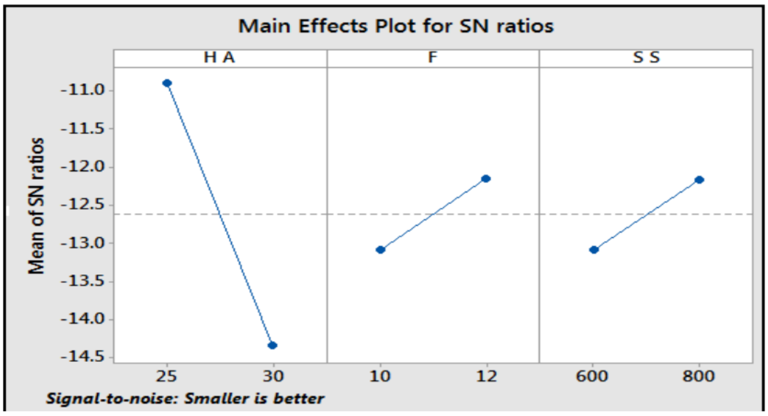

Fig 1 Plot for Signal to Noise for surface roughness

In the ANOVA, of acceleration of drill vibration velocity, the S / N ratios were rated as shown in Table 4 with a confidence level of 95%. Based on the experimental results, the helix angle shows a larger contribution of 50.04%. Here the error was found with 10.85%.

Table 7 ANOVA of Signal to Noise ratio for acceleration of drill bit vibration

Source	DF	SS	MS	F	P	% contribution
H A	1	17.701	7.701	0.87	0.042	50.04
F	1	4.543	4.543	0.51	0.204	12.85
S S	1	4.543	4.543	0.51	0.204	12.85
H A*F	1	0.037	0.037	0.00	0.359	0.1
H A*S S	1	0.037	0.037	0.00	0.359	0.1
F*S S	1	4.682	9.682	1.10	0.485	13.21
Error	1	3.837	8.837			10.85
Total	7	35.381				100

The distribution of the signal-to-noise ratio at the cut-off parameter level is shown in Fig 2. You can read the best cutting parameters from the graph: a helix angle of 25 degrees, a feed rate of 10 mm/min and a spindle speed of 600 rpm.

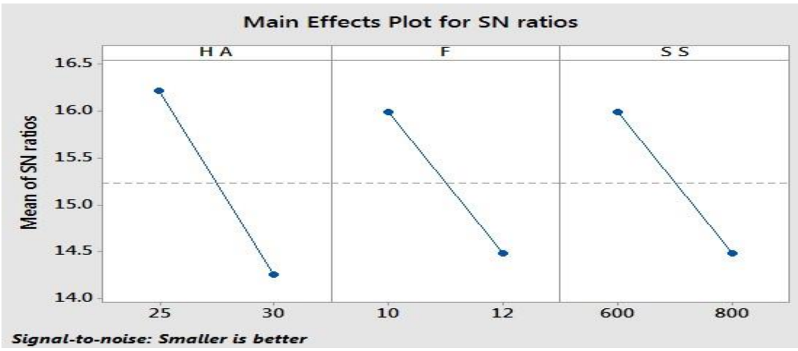

Fig 2 Plot for Signal to Noise ratio for workpiece vibration

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7. RESULTS:

In this work eight experiments (tests) with two levels of cutting parameters in M32 HSS twist drill were carried out. A non-contact monitoring system with a laser Doppler vibrometer was used to observe the vibration of the drill during machining. It was evaluated by analyzing the surface roughness and acceleration of drill bit vibration using Taguchi and ANOVA analysis. It is found that the Helix angle is very important to the surface roughness, followed by the acceleration of the vibration velocity of the drill bit, which contributes 79.85% and 50.04%, respectively. The obtained surface has a helix angle of 25 degrees, and the grinding speed is 12 mm/min. speed and a spindle speed of 800 rpm. The best cutting parameters for vibration acceleration are achieved when the helix angle is 25 degrees, the feed rate is 10 mm/min, and the spindle speed is 600 rpm.

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CHILD SEX TOURISM PREVENTION METHODS: LESSONS FOR CHILD RIGHTS PROTECTION OFFICERS

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ABSTRACT

Background

Annually, more and more children around the world are subjected to abuse. Thus, concerted efforts are needed at local, regional and international levels to bring to an end this horrendous and calculated calamity meted on innocent children. Every child is entitled to full protection from all forms of abuse. This is reaffirmed by the United Nations Convention on the Rights of the Child (UNCRC), an international legal instrument of universal significance. Herein, state parties are obligated to protect children from all forms of abuse (e.g. sexual abuse, child labor, child sex tourism, child trafficking etc.) and promote physical and psychological recovery and social reintegration of child victims. Enshrined in the Convention, the best interest of the child shall be a primary consideration in all actions concerning children, and their rights are to be enjoyed without discrimination of any kind. In all matters affecting the child, the views of the child should be given due weight, in accordance with the age and maturity of the child. In light of the above, any form of child abuse, is a fundamental violation of children's rights.

Purpose

The fundamental rationale for the systematic literature review is to examine child sex tourism prevention strategies, share knowledge to spark and inspire processes that will usher rapid growth from all directions in the fight against the menace.

Methodology

A systematic review of the literatures using information collected from different sources was actuated. Google search engine, google scholar, web of science; and scopus database were used to search for these articles. During the search numeration combinations of words and phrases were used to ensure articles reflect the most recent knowledge and scholarly works. The systematic searches beget varied and voluminous articles which had to be sieved not only to meet the inclusion and exclusion criteria but to ensure the fundamental objectives of the study are wrangled.

Therefore, only peer-reviewed scholarly publications published after 2000 were selected except extracts perceived to be of basal mileage to the study. However, articles published by staunch international organizations known to have been working in child rights and child protection for years and has produced indefatigable knowledge in the promotion of children rights were stealthily appraised.

Results

In summation, to fight CST states and development partners are obliged to ensure: eradication of bad culture and beliefs, addressing root causes, enforcement of code of conduct, community participation, rehabilitation and reintegration of victims, proactive policies and programmes, enactment and enforcement of tough laws, conducting research and sharing data, allocation of

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adequate resources, regular training of frontline staff, non-prosecution of child victims, prosecution of offenders, conducting regular public sensitization, establishment of inter-agency technical committees, maintaining strong collaboration, organizing conferences regularly, access to education for all children, creation of employment opportunities, provision of national documents to all children, criminalization of CST and strict law enforcement, formulation and implementation of national action plan, constant coordination; and strict border control.

Conclusion

In conclusion, to eradicate it calls for eradication of bad culture and beliefs, addressing root causes, enforcement of code of conduct, community participation, rehabilitation and reintegration of victims, proactive policies and programmes, enactment and enforcement of tough laws, conducting research and sharing data, allocation of adequate resources, regular training of frontline staff, non-prosecution of child victims, prosecution of offenders, conducting regular public sensitization, establishment of inter-agency technical committees, maintaining strong collaboration, organizing conferences regularly, access to education for all children, creation of employment opportunities, provision of national documents to all children, criminalization of CST and strict law enforcement, formulation and implementation of national action plan, constant coordination; and strict border control.

Key words: child abuse, child sex tourism, commercial sexual exploitation and prevention

INTRODUCTION

Daily, more and more children around the world are subjected to abuse. Carolin et al (2015) highlights that almost every part of the world except Antarctica experience sex tourism(Brooks & Heaslip, n.d.). Concerted action is needed at local, regional and international levels to bring to an end the phenomena. Every child is entitled to full protection from all forms of abuse. This is reaffirmed by the United Nations Convention on the Rights of the Child (UNCRC), an international legal instrument of universal significance (of which there are 189 States Parties). States are required to protect children from all forms of abuse (e.g. sexual abuse, child labor, child sex tourism, child trafficking etc.) and promote physical and psychological recovery and social reintegration of child victims.

According to the convention, the best interest of the child shall be a primary consideration in all actions concerning children, and their rights are to be enjoyed without discrimination of any kind. In all matters affecting the child, the views of the child should be given due weight, in accordance with the age and maturity of the child(UNICEF, 2019).

Any form of child abuse, is a fundamental violation of children's rights(Estenban Ortiz-Ospina, 2019). The commercial sexual exploitation of children for example, is fundamental violation of children's rights. It comprises sexual abuse by the adult and remuneration in cash or kind to the child or a third person or persons. The child is treated as a sexual object and as well a commercial object. The commercial sexual exploitation of children constitutes a form of coercion and violence against children, and amounts to force labor and contemporary form of slavery(UNICEF, 2008).

The consequences of child abuse on both the children and their communities are copious. In the worst cases, it can be responsible for a child's disappearance or death, or permanent damage to his or her physical and mental health. It might also encourage drug dependency, break families apart, and deprive children of their rights to education and freedom from exploitation. If trapped in commercial sexual exploitation for example, a child may suffer violence at the hands of the clients, the physical and emotional damage of premature sexual activity, and exposure to sexually transmitted infections [STIs] including HIV/AIDS(ILO, 2002). The situation of trafficked girls for instant; is especially marked by the risk of early pregnancy, early motherhood and reproductive illnesses that might affect their ability to have children in the future(Bimbi et al., 2003).

Preventing child abuse particularly child sex tourism requires programs that are comprehensive in addressing both the causes, impacts and processes associated with it(Christiansen, 2015). Interventions must not only target children but also their families, their communities, the perpetrators and relevant institutions; and even the society at large. Thus, it is important to understand the processes of child abuse of all types from the start to finish, including the political, economic, social and cultural contexts in which it occurs. The various actors involved, typical geographical patterns, the types of abusers, the roots and the contributing causes of the problem. For example, in the case of child trafficking, identifying and analyzing these variables allows the planning of a range of interventions at a number of different stages in child trafficking process, including preventive measures, detection and the identification of the children at point of departure, transit and arrival, support to the children trapped in exploitative work, and post trafficking rehabilitative efforts. It also allows key role players to identify the roles they can play according to their strengths, competencies and access.

It is for this purpose amongst other things that this study is proposed. It aims to bring out the fundamental preventive methods in the fight against child abuse more especially child sex tourism so that people can learn to tackle this highly complex problem. The child sex tourism is perceived to be huge in scope, multi-faceted and sensitive, both culturally and politically(UN, 2013).

METHODOLOGY

A systematic review of the literatures using information collected from different sources was actuated. Google search engine, google scholar, web of science; and scopus database were used to search for these articles. During the search numeration combinations of words and phrases were used to ensure articles reflect the most recent knowledge and scholarly works. The systematic searches beget varied and voluminous articles which had to be sieved not only to meet the inclusion and exclusion criteria but to ensure the fundamental objectives of the study are wrangled.

Therefore, only peer-reviewed scholarly publications published after 2000 were selected except extracts perceived to be of basal mileage to the study. However, articles published by staunch international organizations known to have been working in child rights and child protection for years and has produced indefatigable knowledge in the promotion of children rights were stealthily appraised.

Inclusion and Exclusion Procedures

The underneath procedures were followed in articles inclusion. That is, only:

1. Peer-reviewed scholarly articles on the prevention of child sexual abuse.
2. Peer-reviewed scholarly articles published from 2000 to 2021.
3. Articles on international or regional perspectives on the prevention of child sexual abuse.
4. Articles on the prevention of child sexual abuse published by internationals organizations with years of meritorious experiences in child rights and child protection.

To exclude some articles from the review, the below captioned criteria were applied. That is:

1. Non-peer reviewed articles.

2. Articles published before 2000 unless critical and impactful.
3. Media generated articles including newspapers.
4. Articles not published in English language.

In spite of the fact that both qualitative and quantitative articles were trawled, only ninety five (95) articles were qualified for reviewed which is largely due to a dearth of data.

In essence, only peer-reviewed articles and publications by international organizations considered being trustworthy because they occasioned standard, ethical and robust studies were reviewed.

Discussions

The literature review has unearthed a wide range of methods in the prevention of child sexual abuse. To discuss these methods, they are categorized into: eradication of bad culture and beliefs, addressing root causes, enforcement of code of conduct, community participation, rehabilitation and reintegration of victims, proactive policies and programmes, enactment and enforcement of tough laws, conducting research and sharing data, allocation of adequate resources, regular training of frontline staff, non-prosecution of child victims, prosecution of offenders, conducting regular public sensitization, establishment of inter-agency technical committees, maintaining strong collaboration, organizing conferences regularly, access to education for all children, creation of employment opportunities, provision of national documents to all children, criminalization of CST and strict law enforcement, formulation and implementation of national action plan, constant coordination; and strict border control.

Eradication of bad culture and beliefs

Culture as the compass of life is one of the greatest achievements of the human race. Thus, success and harmonious living is highly tied to the culture of a society and as such in most cases any action contrary to it is heavily condemned. However, because of the rapid transformation of the world, certain cultural elements particularly the belief system and practices are becoming harmful instead of being assets worth cherishing. Harmful in the sense that they are parallel to science and fundamental human rights as enshrined in some international, regional; and national instruments crying for change as some other people life and living conditions are put are heightened risk(UN, 1979). This occurs with to fight child abuse, children must be trusted and encourage to make complaints through child-friendly mechanisms and above all, the public must do away with the culture of silent and focus on the best interest of the child and report abuse briskly to the most appropriate authorities(IJM, 2020). Ending child sexual abuse in the rural communities demands the elimination of erroneous beliefs and bad cultural practices such having sex with children can cure HIV/AIDS(Mlekwa, Nyamhanga, Chalya, & Urassa, 2016). Critical in eliminating child sexual abuse is the banning of bad cultural practices and sensitizing children their rights and responsibilities while maintaining child-friendly and protective complaints mechanisms(ECPAT, 2008). To eliminate child sexual abuse and by extension the commercial sexual exploitation of children it is important that poverty, those erroneous cultural beliefs and practices such as having sex with children can cure HIV; and patriarchy are tackled as all these fuel the practice(McCrann, 2017).

Addressing root causes

Social problems though sometimes hard to completely eliminate, its socio-economic and political impacts can be minimized especially if the main root causes are addressed(UNICEF, n.d.). Thus, by not addressing the root causes, it becomes extremely difficult if not impossible to address problems that are either directly or in directly derivative of the unabated causes. In view of the above assertion, the resolution of a social problem lies on the elimination of its fundamental causes(UN, 2009). This is in agreement with, to eliminate child sexual abuse and trafficking it is critical that causative factors such as poverty, lack of parental education, family indebtedness, bad cultural practices; and traditional attitudes are addressed without further delay(Abdulraheem & Oladipo, 2010). While eradicating the commercial sexual exploitation demands tough laws with heavy punishments on the perpetrators and associates, it is a strong prerequisite that governments and NGOs focus on addressing the socio-economic root causes of the menace(Brooks & Heaslip, n.d.). To eliminate child commercial exploitation as survival mechanism, government and development partners should focus on eradicating grinding poverty, lack of food and basic amenities, education facilities, health care services, employment opportunities; and lack of family especially in an emergency situation(ECPAT, 2006). Essential, in the fight against child abuse is adult-focused programming in which they are trained how to support children in difficult situations and equally how to manage anger, distress, rigidity; and unhappiness as they are strong causative factors in putting children at the risk of abuse(NSVRC, 2005).

Similarly, to fight against child sexual exploitation it requires massive reduction in the dependency rate both by adults and children and above all, supporting children to build their self-esteem(Hill, Gold, & Bornstein, 2000). To deter and subsequently end CST, it is fundamental that governments with the support of development partners and local communities address the issues of inadequate laws, ineffective law enforcement, lack of resources, corruption; and immature legal systems that don't only contribute to the existence of the menace but facilitate the escape of perpetrators from prosecution in the countries where the crime is committed(Svensson, 2006). In view of the fact that this menace is deeply configured in numerous psychosocial, economic and historical factors, it is important that the structural causes namely; poverty, drug abuse, diseases and street life are addressed without further delay(Moneda Oliveira Ribeiro, 2009).

Furthermore, to prevent CST in the communities, it is fundamental that critical causes such as poverty, too much hospitality, philanthropic exploitation, marginalization of boys, family breakdown/dysfunction, unsafe schools, the culture of shame, sex tourism, tourism being excused of any action, lack awareness of CST, complacency, negative attitudes toward data collection; and beating perpetrators and deporting them without proper prosecution and reporting are acted on promptly(Christiansen, 2015). While the fight against child sexual abuse commands for the recognition that it is not only practice in well-established premises but even in the streets, addressing poverty, social inequalities and inadequate access to education, health and social services, discrimination against minorities, lack of birth certificates, gender norms, masculinity, bad traditional practices, etc. as they all fuel the sexual exploitation of children(ECPAT, 2011).

Enforcement of code of conduct

Code of conduct as a moral and sometimes legal guide is critical in socio-economic and political development of any society particularly in cohabitation and how members of society treat each other. In the absence of codes, society is converted into a battle field where only the fittest survive(Paul, 1988). However, with code of conduct a clear survival map is chartered where behaviors are strictly couched with rewards and punishments. Thus, codes don't only accord rights to people but placed obligations on them and in this way protecting the disadvantaged communities from the whips and culprit of the privileged including international corporations(Juliet Roper, Steve May, 2007). This substantiate to eradicate child sex tourism, the travel and hospitality industry must sign up to the code of conduct according to which all stakeholders shall have ethical policy banning CST, train their personnels in child sexual abuse especially CST, introduce clauses in contracts that prohibit child sexual abuse, regularly provide information to travelers and tourists reminding them of the legal repercussion of being engaged in CST, educate key people in the destination about CST; and provide regular reports to the governments on the implementation of the code(Cruz, O'Connell Davidson, & Sanchez Taylor, 2019). To ensure CST is eradicated, the travel and hospitality industry must sign and implement the tourism code of conduct concurrently with other policies and legislations(Mekinc & Music, 2015). Governments and the private sector must cooperate to ensure all travel and hospitality industry stakeholders sign the tourism code of conduct that commands them to formulate policies and procedures, train their staff in child rights and child protection issues, include zero tolerance for CST in employment contracts, sensitize tourists and customers on CST, support and engage other stakeholders; and provide annual report on the rate of implementation(Brooks & Heaslip, n.d.).

Similarly, to end CST, all businesses in the travel and hospitality industry in partnership with governments and CSOs must formulate their own business policies embedded in them child rights and child protection issues and other human rights matters as well as the code of conduct(ECPAT, 2016). To address CST all states and development partners are expected to support and participate in the implementation of international and regional human rights treaties, guidelines, policies, children's rights and business principles, code of conduct; and commitment made in the fight against CST in the travel and tourism industry(ECPAT, 2016). To end CST, the travel and tourism industry must in addition to national policies formulate their own policies and code of conduct and educate tourists and employees about them while designating child protection posters in all strategic locations(ASEAN, 2012). To end CST, governments and development partners including the private sector must be strongly committed in ensuring that the travel and hospitality industry is committed to implementing measures including the code of conduct that are meant to prevent the sexual exploitation of children by tourists(ASEAN, 2012). To end CST, the travel and tourist industry must take active part from conceptualization, development of principles, guidelines, code of conduct; and awareness-raising to conducting trainings, incorporating CST in school curriculum; and organizing competitions to drive the messages home(EU, 1996).

Furthermore, to fight child sexual abuse particularly CST, tourism enterprises signing and enforcing code of conduct is a must as it demands proprietors to protect, monitor; and report any suspicious activity involving a child in the industry(Sisavath, 2011). Critical in eliminating CST, encompasses child friendly legal system, tourist enterprises signing and strictly implementing international code of conduct, establishing child offenders register and sharing it with other nations; and governments collaborating with the private sector(ECPAT, 2011).

Community participation

Community participation is ones of the strongest driving forces in national development endeavors. With community participation different resources including experts are pool together making huge impact in the quality of the results and the time taken to produce it(Thwala, 2010). Therefore, in the absence, of community participation, the elimination or minimization of the negative impacts of some social problems in the communities will remain a dream in national blueprints(Nekwaya, 2007). In light of the above community participation is not a principle but a strong prerequisite in communities' problems resolution, concurring with states and development partners in their endeavors to end commercial sexual exploitation of children they must, empower and work with families including children regularly to maximize their capacities and support in building and safeguarding children's best interest(Scott, Mcneish, Bovarnick, &

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Pearce, 2019). The prevention of child sexual exploitation and the rehabilitation and reintegration of victims requires the provision of some support to parents in the area of how to maintain strong relationship with their children, how to handle emotions and trauma, how to build resilience; and how to work with and even explore the different support systems(Scott et al., 2019). To prevent CST in the travel and hospitality industry, advocates and lobbying groups must intensified their calls for sustainable social responsibility awards with the support of the communities(Tepelus, 2008).

In the same vein, to prevent child sexual exploitation in the communities, it is important that parents and other members of the community are regularly sensitized and furthermore supported to be able to seek help and report abuse without fear(Mlekwa et al., 2016). In combating CST, community participation is highly essential as it does not only make members to take ownership of the fight but it can be a strong driving force behind resource mobilization, coordination, implementation; and public sensitization(EU, 1996). To prevent child abuse and neglect in the communities it is pivotal that everyone in the family, community, country and the world is made to understand that it is a collective responsibility to protect and promote the rights of the children(Shashika Rushanthi Silva, 2020).

Rehabilitation and reintegration of victims

Because life is not perfect, it is not uncommon to find others in difficult circumstances to point of requiring support to restore lost status which can be either psychosocial, health, economic or political in nature(WHO, 2020b). Restoring people ability to effectively and independently function is not only a gain for the rehabilitee alone but for the wider society as well since they are elevated to producers’ status and tax payers instead of services consumers only(EU, 2014). Therefore, restoration of physical and psychosocial fitness of persons in difficult circumstances is critical in getting them back on their feet and above all, in eliminating social phenomenon(NATO, 2008). Thus, lending support to the war against child abuse and trafficking requires states and partners commissioning and sustaining well-resourced rescue, recovery, rehabilitation; and reintegration programmes for survivors(Abdulraheem & Oladipo, 2010). While the provision of quality and relevant education to all children is a must in the war against CST, states and partners should provide adequate and relevant professional support to survivors with the ultimate objective of rehabilitating and reintegrating them into mainstream society(Kotrla & Wommack, 2011). In addition to lobbying and advocating, child protection officers especially during emergency and disaster should quickly and professionally distribute relief items and services to prevent children being sexually exploited because of their predicament(ECPAT, 2006). To eradicate child sexual exploitation, it is decisive that with the active participation of children and community members states and partners are engage in aggressive advocacy, programming, policy formulation and implementation, conducting research and vulnerability assessments, rescue, rehabilitation, reintegration; and prosecution of perpetrators and their associates(ECPAT, 2008).

Proactive policies and programmes

Policies and programmes are great tools for governments and organizations in transforming societies as they are not only a guide to service delivery but equally a critical tool in the mobilization of resources including the human ones(MercyCorps, n.d.). For some people to win their hearts and minds to be part of community development endeavors including the fight against social evils, policies and programmes matters(Azeharie & Purnama Sari, 2016). Therefore, to build a society where all feel safe and protected to maximize their potential, highly calculated proactive policies and programmes are fundamental(Merrill, Smith, Cumming, & Daunic, 2017), concurring with to fight against the menace, policy and law makers must change

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their approach and policies to modern crimes particularly those approaches that are not only proactive but profit-centered like those of the private sectors(Açar, 2017). The fight against sexual exploitation of children demands governments, private sector and NGOs to devise programmes meant to support increase in outreach and educational programmes, creation of national database and dissemination of information, increase prosecution and prosecution trainings, hike collaboration; and support national and regional studies(Justice, 2010). To protect children from any harm including their commercial sexual exploitation, governments and development agencies must vigorously promote and sustain respect for children rights and establish child-friendly services and mechanisms(ECPAT, 2015). The fight against CST demands that the travel and hospitality industry moves from volunteerism to taking child rights and child protection issues as a principal social responsibility with the leadership emanating from the World Tourism Organization (WTO) and the private sector(ECPAT UK, 2008). States, in addition to ratifying and domesticating international and regional instruments, they must equally put emphasizing on the adoption of best practices, produces to enhance their implementation and the reporting of child sexual abuse cases(ECPAT UK, 2008).

Similarly, in addition to awareness raising and training programmes, the travel and hospitality industry must and should include formulating policies and procedures, training employees regularly, providing information to travelers; and firmly enshrining zero tolerance of CST in contracts throughout the value chain to effectively combat CST(Carolin, Lindsay, & Victor, 2015). To protect children and prevent child sexual abuse especially trafficking, governments and partners, in addition to establishing commissions, need to formulate national policies and empower the police and other human rights organizations(Brooks & Heaslip, n.d.). To prevent child abuse in the community, there is a need to develop child-focused programmes and projects through which children will be sensitized on child rights and child protection issues such as appropriate behaviors, good touch, personal safety, sexual aggression, victimization, disclosure, identifying offenders, avoiding and escaping abuse(NSVRC, 2005). To effectively and efficiently protect children against sexual abuse in the communities, it is fundamental that child protection organizations put aside ideological differences with the view of formulating programmes and projects that swiftly response to the proper safeguarding of children to grow in a safe and protective environment(ECPAT, 2008).

Furthermore, to eliminate trafficking and child sexual exploitation governments and development partners need to initiate and sustain economic empowerment projects and programmes which entail business training and creation of employment opportunities particularly for the vulnerable communities(Laan, Smit, Busschers, & Aarten, 2011). Signing and domesticating international treaties is central in eradicating child sexual abuse as with such, the legal systems are not only strengthened, but states are obligated to implement them together with associated socio-economic, political programmes and projects to empower children, women; and vulnerable communities(Sisavath, 2011). Conducting research regularly, formulating policies and programmes that are meant to protect and support children and women will decrease the risk of exploitation as the present narrative of “manhood” will change and child poverty too(McCrann, 2017).

Enactment and enforcement of tough laws

The law for years has managed to keep society together and furthermore ensure some socio-economic and political development for all(Seidman, 1972). Law while it accords rights, it places some obligations on people to ensure peace and progress. With the full enforcement of the law, business and people can stride together as behaviors are control and coached to avert infringing on each other’s rights particularly the disadvantaged communities(Tiwari, 2020).

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Formulating and implementing the law without fear and favor doesn't only provide redress but prevent social problems including crimes, lending support to in addition to other national, regional; and international legal instruments meant to protect children rights, all nations must ensure the domestication and implementation of the United Nations Convention on the Rights of the Child (UNCRC) and its protocol to better promote and protect children against all forms of abuse(Mekinc & Music, 2015). To save children from ruthless sexual exploitation, there is a need for tough legislations and their full and strict implementation backed by a strong political will(Mekinc & Music, 2015). To get rid of CST in the hospitality and travel industry, states and development partners must not only stop at training professionals but must also legislate harsh laws and adequately fund public awareness raising campaigns to hammer the messages home(Kotrla & Wommack, 2011). To free children from harm and exploitation, states must live up to expectations by ratifying, signing, domesticating; and implementing international human rights instruments particularly the United Nations Convention on the Rights of the Child commonly known as UNCRC(IJM, 2020). The fight against CST calls for states ratifying, signing and domesticating regional and international standards and strictly complying with them including providing for extra-territorial jurisdiction(EU, 2013).

Similarly, to end CST national courts can be given extra-territorial jurisdiction for offences and crimes committed against children abroad even if the committed crime is not provided for under the laws of the country in which it is committed(EU, 1996). To prevent child sexual abuse it requires governments sign, ratify and domesticate the United Nations Convention on the Right of the Child (UNCRC) and strictly implement it as with such children are not only recognized as human beings but the very least, they will grow in a safe and abusive-free environment(McCrann, 2017). To prevent CST and child sexual abuse in general governments must without unnecessary reservations sign and ratify international and regional conventions and protocols, domesticated them and collaborate nationally and internationally in their implementation especially in training law enforcement agencies, child protection officials; and the judiciary particularly in prosecuting and sharing information about perpetrators(ECPAT, 2011).

Furthermore, the fight against CST demands promulgation of legislations that ensure both international and local perpetrators receive the same penalties without fear and favor(ECPAT, 2011). Enacting laws that don't only criminalized CST but levy heavy penalties on clients, brothel and hotel owners, procurers, pimps, and advertisers just because a child that is not related to anyone is found in their premises can be a strong indicator that children are not sex commodities(Brungs, 2002). The fight against child sex tourism requires the reformation of laws; inter agencies collaboration; and governments and development partners' commitment to fund the fight(Brungs, 2002). To create a protective environment in preventing commercial sexual exploitation of children it is fundamental that national and international efforts are focused on attitudes, traditions, customs, behaviors and practices; governments committing themselves to fulfilling protection rights, encouraging open discussions about child rights and child protection issues, enacting legislations and enforcement; and capacity building(ECPAT, 2006).

Conducting research and sharing data

Research and dependable data has become indispensable for any development endeavor including the fight against phenomenon(Sakellaropoulou, 2020). In the modern world data is not mere information but a formidable input in planning, prediction; and explanation(Oden, 1999). Thus, to effectively and efficiently address national and communal issues planning is at the heart. In the same vein, in addressing social problems of any magnitude research, data; and

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sharing of information is a must(COMMUNITYTOOLBOX, n.d.), substantiating states and partners must invest in and be regularly conducting studies both for evidence-based programming and development of perspectives that are critical in the fight against the menace(Mitchell, Boyd, Mitchell, & Boyd, 2014). To protect children from CST and related abuses governments and NGOs should be conducting studies regularly and call for the morphing of scientific models into sustainable innovations and public policies(Tepelus, 2008). To adequately protect and respond to the needs and aspirations of children including the right to protection against all harms, it is a must that governments and CSOs are constantly involve in research and sharing of data for planning and programming preventive and rehabilitative programmes and projects(Kotrla & Wommack, 2011).

Similarly, to rationally fight CST, states and partners must be regularly conducting research for programming while eliminating drug abuse, poverty; and poor enforcement of legislations, some of the principal causes of the menace(Brooks & Heaslip, n.d.). The fights child sexual exploitation demands regular commissioning of studies by governments and CSOs with public sensitization to encourage collaboration and public participation by them giving accurate and dependable data for subsequent planning and programming(IJM, 2020). To address most social problems including the commercial sexual exploitation of children data is fundamental, thus, preventing CST calls for research, documentation, and sharing of information on public attitudes, knowledge, practices; and commitment to the fight(Mlekwa et al., 2016).

Furthermore, the promotion and establishment of dependable and centralized database systems that can easily permit sharing of records on sex offenders and collection of data on CST is a necessity in the fight against child sexual abuse(EU, 2013). To eradicate child sexual exploitation including CST, governments and development partners must conduct national and regional studies to properly understand the phenomenon and associated practices, formulate national action plans while addressing the principal root causes such as poverty, lack of access to quality education, healthcare services; and national documents including birth certificates(ECPAT, 2019). To protect the travel and tourism industry while preventing CST, proprietors must constantly be conducting research or environmental assessment, staff induction, policy monitoring and evaluation to ensure the business is in full compliance with the laws and code of conducts(ASEAN, 2012). To fight CST, governments and human rights organizations must regularly monitor and evaluate workplace operations in the travel and tourism industry both to ensure there is child protection compliance and a protective environment for children is created and maintain(ASEAN, 2012). States and international development partners including the private sector must invest in development of quality data collection instruments to acquire high-quality data to effectively and efficiently plan approaches to fight the menace(EU, 1996).

Additionally, to promote and strengthen the gathering and exchange of information between nations can be very useful in preventing child sexual abuse(EU, 1996). To win the fight against the exploitation of children, governments and development partners including the private sector must establish strong alliance and invest in research to better understand the phenomenon and subsequently develop better strategies(Moneda Oliveira Ribeiro, 2009). To prevent child sexual abuse in the communities, it is crucial that studies are conducted applying the ecological perspective in order to develop ecological model one of the most promising effective preventive approaches(Choudhry et al., 2018). To fight child sexual menace it requires different strategies since perpetrators and methods of committing the crime are not homogenous and above all, studies need to be conducted for in-depth understanding of the phenomenon and as well for gathering intelligent information(Koning & Rijksen-van Dijke, 2017). To eradicate CST in destinations and communities it is fundamental that statistics, scientific data and information are easily made available for planning and monitoring processes, progresses and decisions that perpetrators make resulting in their engagement in the menace(Voelkel, 2017). Pivotal in the fight against CST include conducting research, regularly training for child protection officers, involving children in drafting policies and laws, building more schools especially in the vulnerable communities; and training more journalist in child right and protection issues(ECPAT, 2011). To prevent CST it is fundamental that governments consider conducting research into the practices in which it is not only international tourists are to be target to participate but even local ones(ECPAT, 2011).

Allocation of adequate resources

For any socio-economic and political development to take place in any society both at national and regional level, funding is required(UN, 2014). With well calculated and adequately funded and managed programmes, development is a possibility(UN, 2019). Thus, in addressing social problems, the same degree of caution and funding is needed concurring with in view of the diversity of the perpetrators and their modus operandi, it is a must that governments and development partners heavily invest financially and humanly in developing sophisticated techniques of crime prevention including commercial sexual exploitation of children(Açar, 2017). To protect children from abuse, funding is critical and above all, it is paramount that these funds are closely monitored and financial and activities reports regularly produced and shared among all relevant stakeholders to ensure they judiciously applied the funds(Mitchell et al., 2014). International organizations support to government in the fight against child abuse should include financial, material; and expatriates or ex-pats in order to strengthen the legal systems, research and development, awareness raising campaigns, national action plan and policy formulation, rehabilitation and reintegration, child participation; and communities' engagement(Nalele, 2019). To effectively and efficiently prevent CST it demands child rights and child protection organizations in the destination countries are supported financially, materially and humanly by the source countries(EU, 2013). Similarly, in addition to public sensitization with regards to child protection available services and reporting mechanisms, it is critical that law enforcement agencies are strengthen, laws and policies are promulgated and enforced strictly without fear and favor(Shashika Rushanthi Silva, 2020).

Regular training of frontline staff

In successfully attain development goals both at international and national level, capacity building is a strong prerequisite especially the frontline staff even during disaster(WHO, 2020a). This is critical because they are the people who implement or supervise the implementation of projects and programmes. Therefore, training is emphatically needed in the fight against social problems including sexual violence in the communities and rebuilding structures and changing attitudes(Anne Chard, 2005). This supports to eradicate child abuse in the communities, governments must support and fund the training of law enforcement agencies especially the child protection officers on the changing technological environment(Mitchell et al., 2014). In the fight against child sexual abuse, it is critical that lawmakers put emphasis on the expansion of training to all care service providers including social workers, child protection officers, health workers, school personnels; and respiratory shelter staff(Kotrla & Wommack, 2011). To minimize child sexual exploitation especially in emergency situations, donors and development partners must constantly be educating their staff on the legal ramifications of engaging in child sexual abuse both with refugee children and children of the host communities(ECPAT, 2006). To prevent CST, in the travel and hospitality industry, proprietors in partnership with relevant government institutions and civil society organizations (CSOs) must invest in building the

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capacity of personnels in the industry and uncompromisingly banned their services and facilities being engaged in the exploitation of children(ECPAT, 2016).

Similarly, the prevention of child sexual abuse demands the constant training of professional child protection officers with the ultimate objective of empowering them to easily identify potential abuse and to react to it swiftly and professionally(EU, 2013). To save children against sexual abuse, it is important that they and their families are legally empowered to be enable to understand the rights and the responsibilities of children(ECPAT, 2008). To effectively address CST there should be a strong private-public partnership and extensive training for social workers and law enforcement agencies, regular communication and sharing of information between partners; and above all, strong funding to implement programmes and projects to safeguard the future of the children(Sisavath, 2011). To eradicate the menace, care service providers including health workers deserve to be exposed to child sexual abuse to be well versed in the indicators of abuse and violence so that they act effectively and timely to both safe lives and make report to appropriate authorities for necessary actions(Moneda Oliveira Ribeiro, 2009).

Additionally, to eradicate child abuse including trafficking, it calls for governments and partners to develop curriculum to be taught in all child protection training institutions, offer regular training to social work practitioners, develop protocols and interview skills to be applied by welfare officers, create national taskforces, develop and compiled best practices for collaboration, prosecute perpetrators, mobilize funds; and often conduct research studies(Mace, 2013). To eliminate child sexual abuse it is essential that teachers are taught basic child rights and protections issues to be able to identify the indicators of abuse and how to work with children for them to be able comfortably disclose what is meted on them(Moneda Oliveira Ribeiro, 2009).

Non-prosecution of child victims

To legally fight an evil phenomenon in the communities, it must be criminalized first, strong legislations promulgated; and implemented without fear and favor. However, to effectively and efficiently address crime, it is critical that perpetrators and victims are adequately listen to and allowed to express themselves. With such, not only evidences are being gathered but lessons are equally learned particularly how, where, why; and with who the crime is committed(Giannelli, 1992). However, any crime that involves children more especially where they are victims, it is fundamental that they neither prosecuted not subjected to the rigor of the legal system not only because of their age and maturity, in addition, it is important that they come forward without fear for support and redress(Paulo, 2006). Thus, prosecuting children will not only allow the crime to grow as it becomes a form of providing safe heaven for perpetrators and associate(UNODC, 2009); concurring with to eliminate child abuse and trafficking, governments must enact tough laws with severe punishments for perpetrators while exonerating and supporting child victims for subsequent reintegration into mainstream society(Abdulraheem & Oladipo, 2010). To eradicate CST in the destinations and communities governments should abolish the criminalization of survivors and strengthen coordinated collaboration of stakeholders including the communities and children(Mekinc & Music, 2015). To fight against CST, it does not only require ratification of international conventions and protocols and their subsequent domestication but equally relevant is to exempt the children from prosecution while punishing the perpetrators, locating and lobbying for policies, counselling and rehabilitative centers, vocational training institutions that would deliver artistic, entrepreneurial and creative opportunities for employment while pulling the children out of the sex industry(ECPAT, 2008).

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Similarly, to combat child sexual exploitation, it is fundamental that punitive laws that debar reporting of exploitation and abuse are removed as with decriminalization, sex workers can work safely, reducing marginalization, vulnerability, stigmatization and above all, it will be an avenue for them to resist political, social and cultural marginalization including children otherwise they go hiding making children more vulnerable(Albright & D'Adamo, 2017). Promulgating and implementing laws that exempt children from criminal liability for prostitution that would permit them to go to the police or any other law enforcement agency to lodge complains without fear will be a giant step in the fight against CST(Brungs, 2002).

Prosecution of offenders

The elimination of crime in the communities requires the participation of all particularly the main stakeholders. The application of the law is critical as it doesn't only ensure victims are compensated for a damage and perpetrators punished appropriately but it communicates deterrent messages(Moser, 2012). Therefore, prosecution of perpetrators is a strong indicator that an active or omission is criminal, warning people to desist from it at any cost. Similarly, the prevention of sexual exploitation of children deserves more stringent laws and efficient prosecution machineries, lending weight to: to circumvent CST in the communities, governments and their partners must criminalized organized crimes, ratify and domesticate international human rights instruments, have in place national register of sex offenders, ensure the enforcement of extra-territorial legislations; and code of conducts(Vrancken & Chetty, 2009). To eradicate child sexual exploitation it is not only enough to legislate laws and ratify international and regional treaties but to enforce them and furthermore enter into bilateral and multilateral cooperation that can result in extra-territorial legislations and enforcement(ECPAT, 2016). To protect children particularly those of the underdeveloped countries, it is a strong prerequisite that such countries enact extra-territorial legislations that permit the prosecution of nationals for crimes they committed in other countries or simply put outside their own country(Svensson, 2006).

Additionally, to protect children against CST, during promotion and marketing of destinations, it must be clearly stated that CST is a crime and above all, no images of children are used in any type of marketing activity(ASEAN, 2012). Prosecution of perpetrators in the countries where the crime is committed can go a long in preventing CST as it will send strong signals that the act is unacceptable and above all, it is advantageous in getting evidences and testimonies for speedy trial(Brungs, 2002).

Conducting regular public sensitization

For any government and its development partners' initiative to register success particularly at community level, in most cases if not in all cases, the participation of the citizen is critical since they are the resources and power(UNESCO, 2004). Their participation can come in different forms be it physical, financial; and intellectual. However, their participation is largely anchored on their understanding and appreciation of the aims and objectives of the programme. With certain degree of awareness they ultimately take the ownership and ensure it succeeds(Lachapelle, 2008). Public education is possible through series of methods ranging from the electronic to the physical organization of people and delivering lectures. Therefore, state to address social problems in the communities, the mobilization of the communities is a must(Júnior & Morais, 2020); substantiating the fight to eradicate the exploitation of children demands viable and regular public sensitization campaigns in addition to directly working with remote communities and children themselves(Scott et al., 2019). In addition to sensitization, to end child abuse demands trainings and development of training materials and manuals with different best practices, skills; and successful investigative skills particularly for law enforcement agencies(Mitchell et al., 2014). With many transactions moving online, including services offered by the travel and hospitality industry, the fight to end CST ask for massive electronic public awareness raising including the production and distribution of campaign messages in all publications and marketing materials online and even offline, in addition to harsh internet legislations(ECPAT UK, 2008).

Similarly, to eliminate child sexual abuse including CST, governments and development partners must continuously be engaged in public sensitization with the ultimate objective of changing negative attitudes and cultural practices that are harmful to children(ECPAT UK, 2008). States and CSOs should energize their public awareness raising campaigns to both criminalize CST, the culture of silence that cause people including parents to turn 'blind eye' to the practice(Brooks & Heaslip, n.d.). To successfully eradicate child sexual abuse in the travel and hospitality industry, regular public sensitization and working with local structures, networks; and community-based organizations are strong prerequisite(ECPAT, 2006). Regularly conducting awareness raising on child sexual abuse, existing protective legislations, international instruments, services, code of conducts; and reporting mechanisms is central in the eradication of CST(ECPAT, 2006). To eliminate child sexual abuse there is a strong need for continuous public education, parents' educating their children on the basic indicators of inappropriate touches, gifts; and states ensuring that laws meant to protect children are enforced without fear and favor(Mlekwa et al., 2016).

Similarly, the fight of CST requires continuous awareness raising targeting personnels in the travel and tourism industry, tourists; tourist guards, taxi drivers; and proprietors while ensuring the availability of finances and coordination of efforts(ECPAT, 2016). Critical in the fight against CST is the continuation of public sensitization and the promotion of ethical business practices especially in the travel and tourism industry(EU, 2013). Fundamental in ending child commercial sexual exploitation is conducting public sensitization for government departments, ministries, NGOs, academics, religious and political leaders on child right and child protection issues with its legal and policy instruments for the public, especially, the key stakeholders to be conversant with those rights and responsibilities enshrined in them(ECPAT, 2008).

Additionally, significant in ending child sexual exploitation is public sensitization which among other things is meant to transform social attitudes, cultural beliefs and practices with emphasis on changing socially constructed perceptions held by men regarding gender related matters(Laan et al., 2011). To prevent child sexual abuse, awareness raising targeting all including schools, universities, tourism and travel industry, law enforcement agencies, judiciary, etc. is very critical as most people don't know the socio-economic and political impacts of the menace(Sisavath, 2011). In the fight against CST public sensitization is key especially its negative impacts on the children and communities and the likelihood of being arrested and severely punished as some perpetrators don't know the associated legal repercussions(Voelkel, 2017).

Furthermore, the conduct of public awareness raising, extending education to all by enacting laws that make access, provision of quality and relevant education compulsory to all children is fundamental in ending child sexual abuse(ECPAT, 2011). To eradicate CST, it requires the active participation of all relevant stakeholders particularly social workers for the formulation and implementation of policies and guidelines, organizing sensitization programmes in the communities, schools, churches, mosques, educating children on child sexual abuse; and the introduction of streetsmart in which the public is sensitize not to give street children support so that they will go to the shelters subsequently clearing them from the street while making them access quality and dependable social welfare services(Spurrier & Alpaslan, 2017).

Establishment of inter-agency technical committees

Specialization is critical in many respects as it doesn't only deepen one's understanding of a particular subject matter but importantly expedites the delivery of services with maximum efficient(Ajiboye BO, Adegun isau, 2013). In addressing complex development issues, it sometime requires the establishment of technical committees charged with different issues based on their expertise. In this way, one is rendering the approach holistic while pooling financial and human resources together for effective response(Islam, 2017). Thus, the fight of child sexual exploitation as complex as it is deserves experts working together in unison, concurring with the effective and efficient protection of children from sexual exploitation requires among other things the establishment and support of child protection committees nationally particularly at the village and remote settlements level(ECPAT, 2006). Establishing and maintaining strong inter-agency technical committees that include police officers, social workers, lawyers, health workers, and NGOs tasked with the responsibilities of apprehending, prosecuting perpetrators and providing support to victims and their families are critical strategies in eliminating CST(Brungs, 2002). One way to successfully combat CST, governments and development partners need to establish, finance; and regularly monitor multi-stakeholders national committee in which all critical institutions including the travel and tourism industry are represented(ECPAT, 2016).

Maintaining strong collaboration

To effectively and efficiently deliver some community developments including social services, it requires some sort of partnership with other institutions particularly the principal stakeholders(Boutillier, O'connor, Zyzis, Roberts, & Banasiak, n.d.). In every partnership each member is valued based on based his or her expertise or comparative advantage that can produce the desired change or development in the community. Thus, collaboration is not only complementary but also a form of resource mobilization since each organization is occasioned not to work in isolation dwindling the required resources and energy(Costelloe et al., 2018); concurring with the fight against child abuse requires strong collaboration and partnership between all stakeholders as it facilitates communication and sharing of information both for planning and the prosecution of perpetrators(Mitchell et al., 2014). In the fight against CST, governments, development partners; and the private sector need to cooperate and establish social audits and industrial associations against CST and trafficking and be engaged in proactive administration(Tepelus, 2008). To end CST, there is a need for strong collaboration between all stakeholders as such initiative, demonstrates states and partners willingness to share resources, knowledge, information and best practices(ECPAT UK, 2008). The fight against CST does not only command for the sustaining of cross-sector collaboration at the international level but equally it requires that it is carried to national, reginal; and community level(ECPAT UK, 2008). Governments need to establish a strong public-private partnership more especially with those businesses in the travel and tourism industry to end CST(ECPAT, 2016).

Equally important in ending CST, is the establishment of mechanisms that will deter high-risk sex offenders from travelling abroad and furthermore strengthen international cooperation to easily prosecute them(EU, 2013). Preventing child sexual abuse especially CST, requires international collaboration including the enforcement of agreed rules, legislations such extra-territorial ones and promoting child-friendly courts where children can give evidence as witnesses particularly outside their culture and familiar environment(ECPAT, 2008). To combat child abuse including trafficking in Bangladesh, the government through inter-ministerial collaboration and partnership with the NGOs community, conduct awareness campaigns, research, lobbying, rescue; and rehabilitation with the bulk of the work done by the NGOs at the community level through data collection, documentation, awareness raising, networking, cross-border collaboration, rescue, rehabilitation and reintegration, ending early marriage; and promotion of birth registration(ECPAT, 2019). For the travel and hospitality industry to effectively prevent CST, they must look for and collaborate with local, national and regional mechanisms or institutions available to support them in the implementation of child protection measures in their workplaces(ASEAN, 2012).

In the same vein, to eliminate CST, states should continue to engage the private sector to understand and appreciate the fact that issues of child right and child protection in the travel and tourism industry is a fundamental factor in responsible and sustainable tourism without which a destination can be sanctioned(ASEAN, 2012). Fighting CST requires collaboration with different partners and to effectively mobilize each partners it is helpful that each is treated differently with different programmes for example, for teachers participation, it is best to incorporate it into the curriculum, for parents, positive parenting delivered by experts moderators; and minority communities is best to work with their culture(Aiffah & Religia, 2020). International collaboration to ensure proper investigation and prosecution of offenders in destination countries with the support of international organizations including Interpol and embassies abroad is a prerequisite in combating CST(Koning & Rijksen-van Dijke, 2017).

Furthermore, governments and development partners collaborating with NGOs is critical in the elimination of CST because their sound knowledge of the local environment or context, access to local communities, international networks; as a source of information is very crucial in eliminating the menace(Koning & Rijksen-van Dijke, 2017). States must not only promulgate legislations but must collaborate with relevant institutions in its implementation such as national and international telecommunication organizations and internet providers to stop production and dissemination of child phonographic materials(ECPAT, 2011). International and interregional collaborations that allows relevant stakeholders to meet and develop action plans and strategies meant to strengthen prevention, prosecution, repatriation, protection; and reintegration can be very useful in the fight against CST(Brungs, 2002).

Organizing conferences regularly

Conferences and seminars regardless of the mode of hosting and level, the fundamental goals remain the same such as to bring together researchers, practitioners, government officials, academics, NGOs, the United Nations organizations; and others; to learn from each other, network; and work together to advance development in the best interest of all. In addressing communities' problems and development issues, organizing conference is therefore critical particularly in sharing cutting edge knowledge and best practices(Metzger et al., 2019). This supports to end the commercial sexual exploitation of children international organizations in partnership with governments and its partners must be regularly conducting international conferences and seminars to share best practices, knowledge; and skills(Nalele, 2019). Essential in the elimination of CST is organizing international and regional conferences for experts to share knowledge, best practices; and studies to strengthen or formulate new policies, programmes; and legislations(ECPAT, 2016). To fight child sexual abuse, including trafficking for any purpose, organizing national and international conferences is very important since during such conferences, it is not only cutting edge knowledge shared but equally best practices and memorandum enter into creating new collaboration while strengthening the old ones(Sisavath, 2011). Critical in the fight against CST is regularly conducting seminars, workshops; and in-services- training for child protection officials to educate them on the recent scholarly works on commercial sexual exploitation of children (CSEC) and CST(Spurrier & Alpaslan, 2017).

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Access to education for all children

Education especially the formal one is one of the greatest tools a state can offer its citizens particularly the children(GPE, 2018). With education the minds are empowered and liberated to formulate and deliver developmental programmes and projects for the benefits of communities and nations by extension and above all, the success of any nation is hugely anchored on its quality education and pool of expertise(Saepudin & Mulyono, 2019). For children and youths the education system does not only offer them education for future development opportunities but also services as a protective mechanism. In schools, children are under the watchful eyes of their teachers protecting them both from abuse and exploitation while acquiring knowledge and skills(CDC, 2009). This is in agreement with in emergency situation to protect the children, it calls for the creation of “Safe Spaces” where children can regularly meet under the watchful eyes of professional social workers where they can be taught basic skills and elementary education including how to stay safe and how take appropriate actions in strange situations(ECPAT, 2006). In addition to supporting communities in the fight against child sexual abuse, governments and CSOs should continue to regularly engage children especially in teaching them fundamental indicators of abuse, building their self-esteem, how to stay safe, build their confidence; and how to freely articulate concerns and worries being experienced without fear(ECPAT, 2006). Equally important in ending CST in the communities include imparting knowledge, skills and supporting children to participate in the fight, establishment of user friendly monitoring and reporting mechanisms; and the provision of professional and timely services for survivors(ECPAT, 2006).

Similarly, fundamental in the elimination of commercial sexual exploitation of children is by educating them on child rights and child protection issues to be familiar with the indicators of abuse and what to do in situations of that nature among other things(IJM, 2020). Critical in CST prevention attempts is awareness raising in vulnerable communities and the provision of education and vocational education for employment opportunities(EU, 2013). Essential in the fight against CST, is the incorporation of child sexual abuse in school curriculum to counteract malicious cultural and religious practices, introducing children to sex education, how to recognize abusive touches and attitude for subsequent reporting and redressing(ECPAT, 2008).

Similarly, to combat child sexual exploitation there should be free and compulsory nine years education because most children especially those from the vulnerable communities are out of school since the parents cannot meet the expenses of books, facilities, uniforms and other associated costs(Sisavath, 2011). Equally significant in combating child sexual abuse is introducing sex education in all primary and secondary schools and furthermore allow the students to openly discuss and debate on the topic and ethics in the exercise of sexuality(Moneda Oliveira Ribeiro, 2009). Government partnering with development partners including GNOs in providing vocational education, placement and job opportunities is critical in preventing CST especially among the vulnerable communities(ECPAT, 2011).

Creation of employment opportunities

For community including nations to develop, there must be some investment in the factors of production(Anderson, 1990). With investments, not only financial wealth is created but peace and stability one of the most significant determinants of development as products and services are created for public consumption averting hunger, malnutrition, conflicts, etc.(Santhirasegaram, 2008). In the event of massive investment either by the government or private sector or in public-private partnership, jobs are created putting money in the hands of people decreasing the occurrence of some social problems including child sexual abuse for which poverty is enormously blamed(Manshor, Abdullah, & Hamed, 2020); lending support to:

to end commercial sexual exploitation of children, governments and NGOs must invest in youth empowerment schemes including easy access to quality and relevant education and vocational training programmes that enhance employment opportunities(Scott et al., 2019). To win the war against child sexual exploitation, it is paramount that governments and development partners invest in the socio-economic and political development of communities especially the disadvantaged ones to eliminate the root cause of CST(Vrancken & Chetty, 2009). Critical and significant in combating child commercial sexual exploitation is access to employment and as such offering children the opportunities to attend vocational training schools with the ultimate objective of security jobs even in the tourism industry will go a long way in the fight against the menace since it is one way of pulling them out of the streets(Sisavath, 2011).

Provision of national documents to all children

Recognition is critical not only for the psychosocial development of an individual but as well as his or socio-economic and political development. With the possession of a valid national document the doors of opportunities and rights are widely opened. For instant, with recognition, one is assured security and access to social services including health and education(Khan, 2018). For states and development partners to meet the needs and aspiration of the children, it is fundamental that they are counted and registered through different methods like birth registration. With birth certificate in addition to having nationality, all fundamental details of a child are captured and documented for the proper promotion and protection of his or her rights hence his or her location, parents' details and age are enlisted. The documentation of age is very critical since it has always being a bone of contention because most perpetrators hide behind it to justify having canal knowledge of a child or engagement in child labor(Brad Blitz, 2014). Therefore, providing national documents for children is assuring them a protective environment and bright future reaffirming to end CST and other forms of child sexual exploitation, documentation of children is critical since it is through birth certificates and other documents that the age of a child can be easily determined particularly children of illegal migrants, ethnic minority; and refugees(ECPAT, 2008). Having national documents is critical in the fight against child sexual abuse (CSA) because apart from being documented as citizens, children use these documents to access basic social services like education, healthcare, employment, etc. reducing the risk of commercial sexual exploitation(Sisavath, 2011).

Criminalization and strict law enforcement

Society since creation has been threatened by many threats that range from social to political. To address current and prevent future ones, several methods have been applied from the traditional one in the form of family dialogue to the modern court system. For an issue to test the legal waters it must be first criminalized by the state through an Act of parliament. When criminalized, it becomes punishable for anyone to be involved in either through an act or omission(Tonry & Farrington, 1995). Sometimes by criminalization a wave of fear is send and deters would-be perpetrators from committing the act. At times, the fear of criminalization never stop some from committing the crime and thus, leading to prosecution, fine; and imprisonment based on the verdict(Rimo, 2021). However, criminalization with heavy penalties has significantly contributed in the reduction of crimes in many societies(Ashworth & Zedner, 2012), concurring with to end CST in the communities and hospitality industry, government must and should legislate tough information, communication and technology laws that criminalized the advertisement of such services or practices and children pornographic materials(Kotrla & Wommack, 2011). International organizations and NGOs must continuous prevail on governments and communities with authentic data to realize that sex tourism never boost the economy of any society vis-à-vis its human cost and criminalized it(Brooks & Heaslip, n.d.). To end CST, governments and the travel and tourism industry must not only condemned it but must demonstrate that sex tourism is a threat to the socio-economic and political development of societies including the tourism industry and thus, should be treated as a crime with heavy punish(Brooks & Heaslip, n.d.). To win the fight against child sex tourism it is of upmost important that it is removed from the realm of other crimes and accorded the fullest and complete condemnation by national laws and all international human rights instruments(Cutts, 2007).

Similarly, to eradicate CST, governments must make the exploitative engagement of children on the internet criminal by making it a crime for any person to create, produce, import, procure, obtain, access, distribute or be in possession of a film or publication that contains child pornography or that advocates, advertises or promotes child pornography or the sexual exploitation of children(Vrancken & Chetty, 2009). In addition to banning employment of children in the fight against CST, states must criminalized the act of engaging children in any activity that is inappropriate for their age or places at risk their well-being, education, physical, mental, spiritual, moral or social development(Vrancken & Chetty, 2009).

Formulation and implementation of national action plan

To remain focus on target is very critical in attaining any given goal. This is possible through a variety of methods. At national and regional level, most development schools favor national action plan where the programmes, objectives, activities, implementation period, main actors, lead agency, outputs and methods of verification, monitoring and evaluation are vividly stated(Slovakia, 2014). National action plan in addition to maintaining actors focus are useful for many things including resource mobilization, accountability and creating space for many actors including remote communities and victims of circumstances(THL, 2019). Thus, it is rational and more cost effective in addressing and preventive development threats including social problem(Interior, 2020); lending support to the formulation of national action plan and entering into international cooperation that allows extradition, sharing of information and joint research is fundamental in the fight against child sexual exploitation(Vrancken & Chetty, 2009). To end CST, countries must not only stop at signing on international and regional agenda but must develop and resourced national action plans unique to their own environment and implemented within the given timespan(ECPAT, 2016). To eradicate CST in member states, it is important that there is constant information sharing and awareness-raising including developing guidelines, national action plans; and monitoring results(EU, 1996).

Similarly, to combat the exploitation of children nations must develop national child protection strategies and support local communities particularly the vulnerable ones to develop their own with the active participation of the children together with the boys the most often forgotten constituency in CST related issues(Sisavath, 2011). In addition to partnering with the media houses, governments must development national strategies that are well resourced, engage the youths in keeping themselves safe and well protected; and regularly organize national and international conferences to share best practices and cutting edge knowledge(ECPAT, 2011).

Constant coordination

In national development it is fundamental that all actors both at national and international level are given enough and specific space to participate. However, to ensure successful conceptualization of programmes and projects plus their implementation with maximum and accountable application of resources, coordination is indispensable. In addition to ensuring that players are focus, coordination significantly reduces or eliminates the duplication of efforts and services, waste of critical resources, complementation, sharing of knowledge and best practices; and networking(Usadolo & Caldwel, 2016). Based on the nature and magnitude of a social problem, coordination is critical in eradicating it or minimizing its negative impacts(Bahadori et al., 2015). This is in agreement with in the fight against child sexual abuse, coordination is fundamental as it does not only ensure full mobilization of resources but people getting to know the full impacts of CST and its associated root causes(EU, 1996). The fight against CST demands coordination which entails synchronization of policies with the ultimate objective of creating a safer environment for children by clearing all them from the streets (i.e. supply-side policies) with those meant to deal with child-related offences (demand-side policies)(Chemin & Mbiekop, 2015)

Strict border control

Borders are no longer mere lines separating two or more pieces of land including nations but a critical factor in the socio-economic and political development of nations. Borders have caused series of serious conflicts and wars between nations. Some nations are at each other's throats because of border issues disrupting life and living condition, trade worth of billions of dollars; and bilateral relationship(Schultz, 2015) and (Sakuwa, 2017). Therefore, to ensure national and regional peace and development, borders must be well established and guarded. Though, the free movement of people, goods and services, is no more a political wish but international requirement, borders need to be checked to ensure other people's socio-economic, political and cultural rights are not violated. With porous borders not only the economy of a country is threaten but the very citizens as criminals can jet in and out without fear putting other people's life at risk particularly the disadvantaged communities(Akinyemi, 2019), concurring with, in preventing CST it is important that governments don't relax borders because they are pressurized or want hard currency as this ultimately result in the creation of a perfect storm of poverty-stricken children coming in contact with wealthy tourists fueling CSEC and SCT(Spurrier & Alpaslan, 2017). In Nigeria, the prevention of commercial sexual exploitation of children will remain a wish unless the issues of porous borders, lack of law enforcement, corrupt government officials, the involvement of international criminal organizations or networks; and limited capacity of or commitment by immigration and law enforcement officers to control borders are permanently addressed(Adepelumi, 2015). Because of the porosity of the borders between Nepal and India in addition to corrupt law enforcement agencies, children are easily ferried to different destinations for commercial sexual exploitation(Ahmed, 2005). Trading in children on borders of Mozambique and South Africa has been incessant since both nations were fighting for independent and has resulted in many children being sold in the sex industries particularly in South Africa(IOM, 2003). In recent years, there has been a high volume of human trafficking and subsequent trading between India and Bangladesh due to porous borders as a result of mix topographical features like rivers, ponds, agricultural fields, villages and even houses where the entrance is in India and the backdoor is in Bangladesh making patrolling extremely hard especially with bad roads(Kumar, 2016).

Summary and conclusion

In summary, the strategies to prevent CST entail eradication of bad culture and beliefs, addressing root causes, enforcement of code of conduct, community participation, rehabilitation and reintegration of victims, proactive policies and programmes, enactment and enforcement of tough laws, conducting research and sharing data, allocation of adequate resources, regular training of frontline staff, non-prosecution of child victims, prosecution of offenders, conducting regular public sensitization, establishment of inter-agency technical committees, maintaining strong collaboration, organizing conferences regularly, access to education for all children, creation of employment opportunities, provision of national documents to all children, criminalization of CST and strict law enforcement, formulation and implementation of national action plan, constant coordination; and strict border control.

Declaration of conflict of interest

I declare that there is no conflict of interest with respect to the study, authorship and/or publication of the manuscript.

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Ethics Approval

Ethics approval was not necessary for a study of this nature and scope.

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ODD RADIO MEAN GRACEFUL LABELING ON DEGREE SPLITTING OF TRIANGULAR SNAKE GRAPHS

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ABSTRACT

A Radio Mean Labeling of a connected graph G is a injection ϕ from the vertex set V(G) to N such that for any two distinct vertices u and v of G satisfying the condition $d(u, v) + \left\lceil \frac{\phi(u)+\phi(v)}{2} \right\rceil \geq 1 + diam(G)$. A graph which admits radio mean labeling is called radio mean graph. The radio mean number of ϕ, $rmn(\phi)$, is the maximum number assigned to any vertex of G. The radio mean number of G, rmn(G) is the minimum value of $rmn(\phi)$ taken over all radio mean labeling ϕ of G. In this paper we introduce a new concept odd radio mean graceful labeling and we investigate the odd mean graceful labeling on degree splitting of Triangular Snake graphs.

Keywords: *Radio mean graceful, odd radio mean graceful, Degree splitting graph, Triangular snake, Double triangular snake, Triple triangular snake.*

1. INTRODUCTION

A graph labeling is an assignment of integers to the vertices or edges or both subject to certain conditions. Chartrand et al developed the concept of radio labeling in [1]. Somasundaram S and Ponraj introduce the notion of mean labeling of graphs in [9]. Radio mean labeling was introduced by Ponraj et al in [7]. Sampathkumar E and Walikar H B introduced notion of the splitting graph of a graph in [8]. Ponraj R and S Somasundaram developed the concept of degree splitting of graphs in [6]. S. Somasundaram, S.S Sandhya and S.P Viji, introduced the concept of Geometric mean labeling on Degree splitting graphs in [10]. N. Revathi found the Vertex odd mean and even mean labeling of some graphs in [7]. C David Raj, K Sunitha and A Subramanian introduced Radio odd mean and even mean labeling of some graphs in [2]. In this paper we investigate the odd radio mean graceful labeling of degree splitting of Triangular snake graphs. Throughout this paper we consider simple, undirected, finite and connected graphs. $\lceil x \rceil$ is the smallest integer greater than or equal to x, for any real x. For theoretic terminology, we refer to Harary[3] and for a detailed survey of graph labeling we refer to Gallian[2]. The notations V(G) is the vertex set of G, E(G) is the edge set of G, d(u,v) is the distance between the vertices u and v, diam(G) is the diameter of G, DS(G) is the degree splitting of graph G and |V| is the order of a graph G.

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2. Definitions

Definition 2.1: Triangular snake (T_n) is obtained from a path $u_1u_2...u_n$ by joining u_i and u_{i+1} to a new vertex v_i for $1 \leq i \leq n-1$. That is, every edge of path is replaced by a triangle C_3.

Definition 2.2: Double triangular snake $D(T_n)$ is obtained from a path $u_1u_2...u_n$ by joining u_i and u_{i+1} to two new vertices v_i and w_i for $1 \leq i \leq n-1$. That is, every edge of path is replaced by two triangles with a common path.

Definition 2.3: Triple triangular snake $T(T_n)$ is obtained from a path $u_1u_2...u_n$ by joining u_i and u_{i+1} to three new vertices v_i, w_i and x_i for $1 \leq i \leq n-1$. That is, every edge of path is replaced by three triangles with a common path.

Definition 2.4: Odd radio mean graceful labeling is a bijection $\Phi : V(G) \rightarrow \{1, 3, 5, \ldots, 2|V| - 1\}$ satisfying the condition $d(u, v) + \left\lceil \frac{\phi(u)+\phi(v)+1}{2} \right\rceil \geq 1 + diam(G)$, for every $u, v \in V(G)$.

3.Main Results

Theorem 3.1: $DS(T_n)$ is an odd radio mean graceful graph.

Proof: Let s_i, $1 \leq i \leq n$ and t_i, $1 \leq i \leq n-1$ be the vertices of T_n. Introduce two new vertices u, and v and join them to the vertices of T_n with degree two and four respectively. The resultant graph is $DS(T_n)$ whose vertex set is $V = \{ s_i, 1 \leq i \leq n\} \cup \{ t_i, 1 \leq i \leq n-1\} \cup \{u, v\}$

Clearly the diameter of $DS(T_n) = \begin{cases} 1, n = 2 \\ 2, n = 3 \\ 3, n > 3 \end{cases}$

Define a bijection $\Phi : V(DS(T_n)) \rightarrow \{1, 3, 5, \ldots, 2|V| - 1\}$ by

$\Phi(s_i) = 2i - 1$, $1 \leq i \leq n$, $\Phi(t_i) = 2n + 2i + 3$, $1 \leq i \leq n-1$, $\Phi(u) = 2n + 1$, $\Phi(v) = 2n + 3$.

Case 1: n = 2

Since the diameter = 1, the condition $d(u, v) + \left\lceil \frac{\phi(u)+\phi(v)+1}{2} \right\rceil \geq 1 + diam(G)$ is obviously satisfied by all the pair of vertices $u, v \in V(G)$.

Case 2: n = 3

Since the diameter = 2, the condition $d(u, v) + \left\lceil \frac{\phi(u)+\phi(v)+1}{2} \right\rceil \geq 1 + diam(G)$ is obviously satisfied by all the pair of vertices $u, v \in V(G)$.

Case 3: n > 3

Now we detect the odd radio mean graceful condition for Φ.

Subcase (i): Examine the pair (s_i, s_j), $1 \leq i \leq n-1$, $i+1 \leq j \leq n$;

$$d(s_i, s_j) + \left\lceil \frac{\phi(s_i) + \phi(s_j) + 1}{2} \right\rceil \geq 1 + \left\lceil \frac{2i + 2j - 1}{2} \right\rceil \geq 4 = 1 + \text{diam}(DS(T_n)).$$

Subcase (ii): Examine the pair (s_i, t_j), $1 \leq i \leq n$, $1 \leq j \leq n-1$;

$$d(s_i, t_j) + \left\lceil \frac{\phi(s_i) + \phi(t_j) + 1}{2} \right\rceil \geq 1 + \left\lceil \frac{2n + 2i + 2j + 3}{2} \right\rceil \geq 4.$$

Subcase (iii): Examine the pair (s_i, u), $1 \leq i \leq n$;

$$d(s_i, u) + \left\lceil \frac{\phi(s_i) + \phi(u) + 1}{2} \right\rceil \geq 1 + \left\lceil \frac{2n + 2i + 1}{2} \right\rceil \geq 4.$$

Subcase (iv): Examine the pair (s_i, v), $1 \leq i \leq n$;

$$d(s_i, v) + \left\lceil \frac{\phi(s_i) + \phi(v) + 1}{2} \right\rceil \geq 1 + \left\lceil \frac{2n + 2i + 3}{2} \right\rceil \geq 4.$$

Subcase (v): Examine the pair (t_i, t_j), $1 \leq i \leq n-2$, $i+1 \leq j \leq n-1$;

$$d(t_i, t_j) + \left\lceil \frac{\phi(t_i) + \phi(t_j) + 1}{2} \right\rceil \geq 2 + \left\lceil \frac{4n + 2i + 2j + 7)}{2} \right\rceil \geq 4.$$

Subcase (vi): Examine the pair (t_i, u), $1 \leq i \leq n-1$;

$$d(t_i, u) + \left\lceil \frac{\phi(t_i) + \phi(u) + 1}{2} \right\rceil \geq 1 + \left\lceil \frac{4n + 2i + 5}{2} \right\rceil \geq 4.$$

Subcase (vii): Examine the pair (t_i, v), $1 \leq i \leq n-1$;

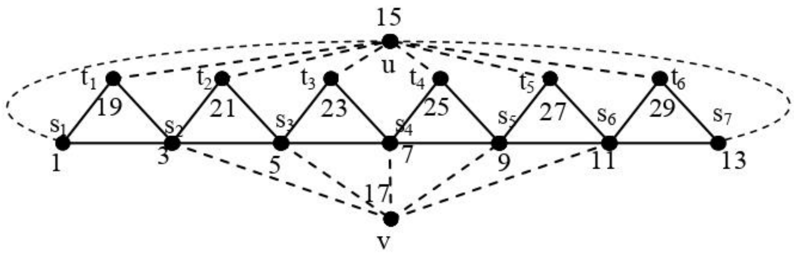
$$d(t_i, v) + \left\lceil \frac{\phi(t_i) + \phi(v) + 1}{2} \right\rceil \geq 2 + \left\lceil \frac{4n + 2i + 7}{2} \right\rceil \geq 4.$$

Subcase (viii): Examine the pair (u, v);

$$d(u, v) + \left\lceil \frac{\phi(u) + \phi(v) + 1}{2} \right\rceil \geq 3 + \left\lceil \frac{4n + 5}{2} \right\rceil \geq 4.$$

Thus, the odd radio mean graceful condition is satisfied for all the pair of vertices. Hence $DS(T_n)$ is an odd radio mean graceful graph.

Figure 1: Odd radio mean graceful labeling of $DS(T_7)$



Theorem 3.2: $DS((D(T_n))$ is an odd radio mean graceful graph.

Proof: Let s_i, $1 \leq i \leq n$, t_i, u_i, $1 \leq i \leq n-1$ be the vertices of $D(T_n)$. Introduce three new vertices v, w, x and join them to the vertices of $D(T_n)$ with degree two, three and six respectively. The resultant graph is $DS(D(T_n))$ whose vertex set is $V = \{ s_i, t_j, u_k, 1 \leq i \leq n, 1 \leq j, k \leq n-1\} \cup \{u, v, x\}$.

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Clearly the diameter of DS(D(T_n)) = $\begin{cases} 3, n = 2,3,4,5 \\ 4, n > 5 \end{cases}$

Define a bijection Φ : V(DS(D(T_n))) → {1, 3, 5, …, 2|V| – 1} by

$\Phi(s_i) = 4n + 2i - 5$, $1 \le i \le n$, $\Phi(t_i) = 2i - 1$, $1 \le i \le n - 1$, $\Phi(u_i) = 2n + 2i - 3$, $1 \le i \le n - 1$,

$\Phi(v) = 6n - 3$, $\Phi(w) = 6n - 1$, $\Phi(x) = 6n + 1$.

Case 1: n = 2, 3, 4, 5

Without loss of generality, assume that there is no adjacency between the vertices with labels 1 and 3.

If d(u, v) = 1, then $\frac{\phi(u) + \phi(v)}{2} \ge 3$.

Hence the condition $d(u, v) + \left\lceil \frac{\phi(u) + \phi(v)}{2} \right\rceil \ge 1 + diam(G)$ is satisfied for all u, v ϵ V(G) for n = 2, 3, 4, 5.

Case 2: n > 5

Now we detect the odd radio mean graceful condition for Φ.

Subcase (i): Examine the pair (s_i, s_j), $1 \le i \le n-1$, $i+1 \le j \le n$;

$d(s_i, s_j) + \left\lceil \frac{\phi(s_i)+\phi(s_j)+1}{2} \right\rceil \ge 1 + \left\lceil \frac{8n + 2i + 2j - 9}{2} \right\rceil \ge 5 = 1 + diam(DS(D(T_n)))$.

Subcase (ii): Examine the pair (s_i, t_j), $1 \le i \le n$, $1 \le j \le n - 1$;

$d(s_i, t_j) + \left\lceil \frac{\phi(s_i)+\phi(t_j)+1}{2} \right\rceil \ge 1 + \left\lceil \frac{4n + 2i + 2j - 5}{2} \right\rceil \ge 5$.

Subcase (iii): Examine the pair (s_i, u_j), $1 \le i \le n, 1 \le j \le n - 1$;

$d(s_i, u_j) + \left\lceil \frac{\phi(s_i) + \phi(u_j) + 1}{2} \right\rceil \ge 1 + \left\lceil \frac{6n + 2i + 2j - 7}{2} \right\rceil \ge 5$.

Subcase (iv): Examine the pair (s_i, v), $1 \le i \le n$;

$d(s_i, v) + \left\lceil \frac{\phi(s_i) + \phi(v) + 1}{2} \right\rceil \ge 2 + \left\lceil \frac{10n + 2i - 7}{2} \right\rceil \ge 5$.

Subcase (v): Examine the pair (s_i, w), $1 \le i \le n$;

$d(s_i, w) + \left\lceil \frac{\phi(s_i) + \phi(w) + 1}{2} \right\rceil \ge 1 + \left\lceil \frac{10n + 2i - 5}{2} \right\rceil \ge 5$.

Subcase (vi): Examine the pair (s_i, x), $1 \le i \le n$;

$d(s_i, x) + \left\lceil \frac{\phi(s_i) + \phi(x) + 1}{2} \right\rceil \ge 1 + \left\lceil \frac{10n + 2i - 3}{2} \right\rceil \ge 5$.

Subcase (vii): Examine the pair (t_i, t_j), $1 \le i \le n - 2$, $i+1 \le j \le n - 1$;

$d(t_i, t_j) + \left\lceil \frac{\phi(t_i) + \phi(t_j) + 1}{2} \right\rceil \ge 2 + \left\lceil \frac{2i + 2j - 1}{2} \right\rceil \ge 5$.

Subcase (viii): Examine the pair (t_i, u_j), $1 \le i, j \le n - 1$;

$d(t_i, u_j) + \left\lceil \frac{\phi(t_i) + \phi(u_j) + 1}{2} \right\rceil \ge 2 + \left\lceil \frac{2n + 2i + 2j - 3}{2} \right\rceil \ge 5$.

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Subcase (ix): Examine the pair (t_i, v), $1 \le I \le n-1$;

$$d(t_i, v) + \left\lceil \frac{\phi(t_i)+\phi(v)+1}{2} \right\rceil \ge 1 + \left\lceil \frac{6n+2i-3}{2} \right\rceil \ge 5.$$

Subcase (x): Examine the pair (t_i, w), $1 \le i \le n-1$;

$$d(t_i, w) + \left\lceil \frac{\phi(t_i)+\phi(w)+1}{2} \right\rceil \ge 2 + \left\lceil \frac{6n+2i-1}{2} \right\rceil \ge 5.$$

Subcase (xi): Examine the pair (t_i, x), $1 \le i \le n-1$;

$$d(t_i, x) + \left\lceil \frac{\phi(t_i)+\phi(x)+1}{2} \right\rceil \ge 2 + \left\lceil \frac{6n+2i+1}{2} \right\rceil \ge 5.$$

Subcase (xii): Examine the pair (u_i, u_j), $1 \le i \le n-2$, $i+1 \le j \le n-1$;

$$d(u_i, u_j) + \left\lceil \frac{\phi(u_i)+\phi(u_j)+1}{2} \right\rceil \ge 2 + \left\lceil \frac{4n+2i+2j-5}{2} \right\rceil \ge 5.$$

Subcase (xiii): Examine the pair (u_i, v), $1 \le i \le n-1$;

$$d(u_i, v) + \left\lceil \frac{\phi(u_i)+\phi(v)+1}{2} \right\rceil \ge 1 + \left\lceil \frac{8n+2i-5}{2} \right\rceil \ge 5.$$

Subcase (xiv): Examine the pair (u_i, w), $1 \le i \le n-1$;

$$d(u_i, w) + \left\lceil \frac{\phi(u_i)+\phi(w)+1}{2} \right\rceil \ge 2 + \left\lceil \frac{8n+2i-3}{2} \right\rceil \ge 5.$$

Subcase (xv): Examine the pair (u_i, x), $1 \le i \le n-1$;

$$d(u_i, x) + \left\lceil \frac{\phi(u_i)+\phi(x)+1}{2} \right\rceil \ge 2 + \left\lceil \frac{8n+2i-1}{2} \right\rceil \ge 5.$$

Subcase (xvi): Examine the pair (v, w);

$$d(v, w) + \left\lceil \frac{\phi(v)+\phi(w)+1}{2} \right\rceil \ge 3 + \left\lceil \frac{12n-3}{2} \right\rceil \ge 5.$$

Subcase (xvii): Examine the pair (v, x);

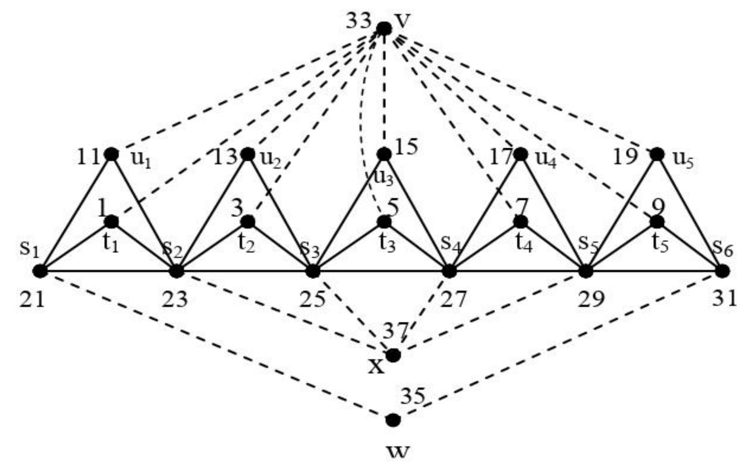
$$d(v, x) + \left\lceil \frac{\phi(v)+\phi(x)+1}{2} \right\rceil \ge 3 + \left\lceil \frac{12n-1}{2} \right\rceil \ge 5.$$

Subcase (xviii): Examine the pair (w, x);

$$d(w, x) + \left\lceil \frac{\phi(w)+\phi(x)+1}{2} \right\rceil \ge 3 + \left\lceil \frac{12n+1}{2} \right\rceil \ge 5.$$

Thus, the odd radio mean graceful condition is satisfied for all the pair of vertices. Hence DS(D(T_n)) is an odd radio mean graceful graph.

Example: DS(D(T_6) is an odd radio mean graceful graph.



Theorem 3.3: $DS((T(T_n))$ is an odd radio mean graceful graph.

Proof: Let s_i, $1 \le i \le n$, t_i, u_i, v_i, $1 \le i \le n-1$ are the vertices of $T(T_n)$. Introduce three new vertices w, x, y and join them to the vertices of $T(T_n)$ with degree two, four and eight respectively. The resultant graph is $DS(T(T_n))$ whose vertex set is $V = \{ s_i, t_j, u_k, v_m \; 1 \le i \le n, 1 \le j, k, m \le n-1\} \cup \{w, x, y\}$.

Clearly the diameter of $DS(T(T_n)) = \begin{cases} 3, n = 2,3,4,5 \\ 4, n > 5 \end{cases}$

Define a bijection $\Phi : V(DS(T(T_n))) \to \{1, 3, 5, \ldots, 2|V| - 1\}$ by

$\Phi(s_i) = 6n + 2i - 3$, $1 \le i \le n$, $\Phi(t_i) = 2i + 3$, $1 \le i \le n-1$, $\Phi(u_i) = 2n + 2i + 1$, $1 \le i \le n-1$

$\Phi(v_i) = 4n + 2i - 1$, $\Phi(w) = 1$, $\Phi(x) = 3$, $\Phi(y) = 8n - 1$.

Case 1: n = 2, 3, 4, 5

Without loss of generality, assume that there is no adjacency between the vertices with labels 1 and 3.

If $d(u, v) = 1$, then $\frac{\phi(u) + \phi(v)}{2} \ge 3$.

Hence the condition $d(u, v) + \left\lceil \frac{\phi(u) + \phi(v)}{2} \right\rceil \ge 1 + diam(G)$ is satisfied for all $u, v \in V(G)$ for $n = 2, 3, 4, 5$.

Case 2: n > 5

Now we detect the odd radio mean graceful condition for Φ.

Subcase (i): Examine the pair (s_i, s_j), $1 \le i \le n-1$, $i+1 \le j \le n$;

$d(s_i, s_j) + \left\lceil \frac{\phi(s_i) + \phi(s_j) + 1}{2} \right\rceil \ge 1 + \left\lceil \frac{12n + 2i + 2j - 5}{2} \right\rceil \ge 5 = 1 + diam(DS(T(T_n)))$.

Subcase (ii): Examine the pair (s_i, t_j), $1 \le i \le n$, $1 \le j \le n-1$;

$d(s_i, t_j) + \left\lceil \frac{\phi(s_i) + \phi(t_j) + 1}{2} \right\rceil \ge 1 + \left\lceil \frac{6n + 2i + 2j + 1}{2} \right\rceil \ge 5$.

Subcase (iii): Examine the pair (s_i, u_j), $1 \le i \le n$, $1 \le j \le n-1$;

$d(s_i, u_j) + \left\lceil \frac{\phi(s_i) + \phi(u_j) + 1}{2} \right\rceil \ge 1 + \left\lceil \frac{8n + 2i + 2j - 1}{2} \right\rceil \ge 5$.

Subcase (iv): Examine the pair (s_i, v_j), $1 \le i \le n$, $1 \le j \le n-1$;

$d(s_i, v_j) + \left\lceil \frac{\phi(s_i) + \phi(v_j) + 1}{2} \right\rceil \ge 1 + \left\lceil \frac{10n + 2i + 2j - 3}{2} \right\rceil \ge 5$.

Subcase (v): Examine the pair (s_i, w), $1 \le i \le n$;

$d(s_i, w) + \left\lceil \frac{\phi(s_i) + \phi(w) + 1}{2} \right\rceil \ge 2 + \left\lceil \frac{6n + 2i - 1}{2} \right\rceil \ge 5$.

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Subcase (vi): Examine the pair (s_i, x), $1\leq i \leq n$;

$d(s_i, x) + \left\lceil \frac{\phi(s_i)+\phi(x)+1}{2} \right\rceil \geq 1 + \left\lceil \frac{6n+2i+1}{2} \right\rceil \geq 5.$

Subcase (vii): Examine the pair (s_i, y), $1\leq i \leq n$;

$d(s_i, y) + \left\lceil \frac{\phi(s_i)+\phi(y)+1}{2} \right\rceil \geq 1 + \left\lceil \frac{14n+2i-3}{2} \right\rceil \geq 5.$

Subcase (viii): Examine the pair (t_i, t_j), $1\leq i \leq n-2$, $i+1\leq j \leq n-1$;

$d(t_i, t_j) + \left\lceil \frac{\phi(t_i)+\phi(t_j)+1}{2} \right\rceil \geq 2 + \left\lceil \frac{2i+2j+7}{2} \right\rceil \geq 5.$

Subcase (ix): Examine the pair (t_i, u_j), $1\leq i, j \leq n-1$;

$d(t_i, u_j) + \left\lceil \frac{\phi(t_i)+\phi(u_j)+1}{2} \right\rceil \geq 2 + \left\lceil \frac{2n+2i+2j+5}{2} \right\rceil \geq 5.$

Subcase (x): Examine the pair (t_i, v_j), $1\leq i, j\leq n-1$;

$d(t_i, v_j) + \left\lceil \frac{\phi(t_i)+\phi(v_j)+1}{2} \right\rceil \geq 1 + \left\lceil \frac{4n+2i+2j+3}{2} \right\rceil \geq 5.$

Subcase (xi): Examine the pair (t_i, w), $1\leq i \leq n-1$;

$d(t_i, w) + \left\lceil \frac{\phi(t_i)+\phi(w)+1}{2} \right\rceil \geq 1 + \left\lceil \frac{2i+5}{2} \right\rceil \geq 5.$

Subcase (xii): Examine the pair (t_i, x), $1\leq i \leq n-1$;

$d(t_i, x) + \left\lceil \frac{\phi(t_i)+\phi(x)+1}{2} \right\rceil \geq 2 + \left\lceil \frac{2i+7}{2} \right\rceil \geq 5.$

Subcase (xiii): Examine the pair (t_i, y), $1\leq i \leq n-1$;

$d(t_i, y) + \left\lceil \frac{\phi(t_i)+\phi(y)+1}{2} \right\rceil \geq 2 + \left\lceil \frac{8n+2i+3}{2} \right\rceil \geq 5.$

Subcase (xiv): Examine the pair (u_i, u_j), $1\leq i \leq n-2$, $i+1\leq j \leq n-1$;

$d(u_i, u_j) + \left\lceil \frac{\phi(u_i)+\phi(u_j)+1}{2} \right\rceil \geq 2 + \left\lceil \frac{4n+2i+2j+3}{2} \right\rceil \geq 5.$

Subcase (xv): Examine the pair (u_i, v_j), $1\leq i, j \leq n-1$;

$d(u_i, v_j) + \left\lceil \frac{\phi(u_i)+\phi(v_j)+1}{2} \right\rceil \geq 2 + \left\lceil \frac{6n+2i+2j+1}{2} \right\rceil \geq 5.$

Subcase (xvi): Examine the pair (u_i, w), $1\leq i \leq n-1$;

$d(u_i, w) + \left\lceil \frac{\phi(u_i)+\phi(w)+1}{2} \right\rceil \geq 1 + \left\lceil \frac{2n+2i+3}{2} \right\rceil \geq 5.$

Subcase (xvii): Examine the pair (u_i, x), $1\leq i \leq n-1$;

$d(u_i, x) + \left\lceil \frac{\phi(u_i)+\phi(x)+1}{2} \right\rceil \geq 2 + \left\lceil \frac{2n+2i+5}{2} \right\rceil \geq 5.$

Subcase (xviii): Examine the pair (u_i, y), $1\leq i \leq n-1$;

$d(u_i, y) + \left\lceil \frac{\phi(u_i)+\phi(y)+1}{2} \right\rceil \geq 2 + \left\lceil \frac{10n+2i+1}{2} \right\rceil \geq 5.$

Subcase (xix): Examine the pair (v_i, v_j), $1\leq i \leq n-2$, $i+1\leq j \leq n-1$;

$d(v_i, v_j) + \left\lceil \frac{\phi(v_i)+\phi(v_j)+1}{2} \right\rceil \geq 2 + \left\lceil \frac{8n+2i+2j-1}{2} \right\rceil \geq 5.$

Subcase (xx): Examine the pair (v_i, w);

$d(v_i, w) + \left\lceil \frac{\phi(v_i)+\phi(w)+1}{2} \right\rceil \geq 1 + \left\lceil \frac{4n+2i+1}{2} \right\rceil \geq 5.$

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Subcase (xxi): Examine the pair (v_i, x);

$$d(v_i, x) + \left\lceil \frac{\phi(v_i)+\phi(x)+1}{2} \right\rceil \geq 2 + \left\lceil \frac{4n+2i+3}{2} \right\rceil \geq 5.$$

Subcase (xxii): Examine the pair (v_i, y);

$$d(v_i, y) + \left\lceil \frac{\phi(v_i)+\phi(y)+1}{2} \right\rceil \geq 2 + \left\lceil \frac{12n+2i-1}{2} \right\rceil \geq 5.$$

Subcase (xxiii): Examine the pair (w, x);

$$d(w, x) + \left\lceil \frac{\phi(w)+\phi(x)+1}{2} \right\rceil \geq 3 + \left\lceil \frac{5}{2} \right\rceil \geq 5.$$

Subcase (xxiv): Examine the pair (w, y);

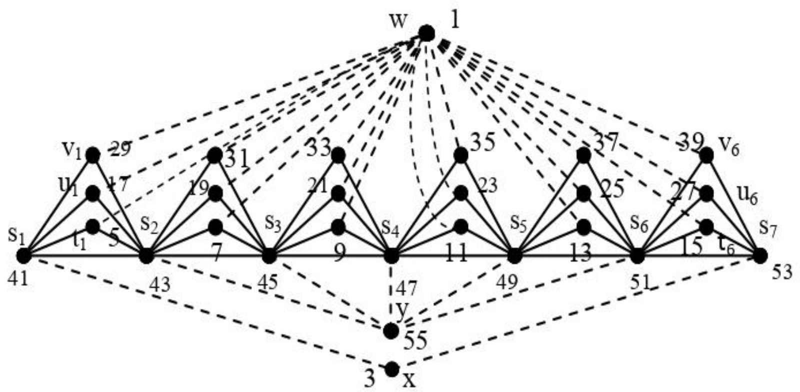
$$d(w, y) + \left\lceil \frac{\phi(w)+\phi(y)+1}{2} \right\rceil \geq 3 + \left\lceil \frac{8n+1}{2} \right\rceil \geq 5.$$

Subcase (xxv): Examine the pair (x, y);

$$d(x, y) + \left\lceil \frac{\phi(x)+\phi(y)+1}{2} \right\rceil \geq 3 + \left\lceil \frac{8n+3}{2} \right\rceil \geq 5.$$

Thus, the odd radio mean graceful condition is satisfied for all the pair of vertices. Hence $DS(T(T_n))$ is an odd radio mean graceful graph.

Example: $DS(T(T_7)$ is an odd radio mean graceful graph.



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BUSINESS NETWORKING AND RELATIONSHIP BUILDING VIA KEY MARKETING INITIATIVES

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ABSTRACT

The Relationship matters!!! Equity and Justice with all fairness while treating your customers as partners is a must in relationship building looking at the cost of getting a new customer. The exorbitant cost involved in acquiring a new customer has become a strong limitation and this hard core fact stops one from losing any existing customer. The cost of acquiring customers and finding good business partners makes retaining these relationships vital to your success. Treating your business partners, customers and other community members with honesty, trust, fairness and respect contributes to strength and longevity in your business relationships. Stepping on relationship, a certain sales representative earn kudos when others are seen gasping for the business. It is an art of converting non-assuming person into your customer. It is an art of attraction. When a sales representative offers a solution to the problem faced by a potential customer, not only the sales take place but the person gets converted into your customer almost on a permanent basis, and then the key is relationship, intended to make him a life time 'friend' customer. Every dealer deals in goods and services but the key to success lies in relationship building. The skill of relations may come natural to the salesman or it may be acquired by him from some earlier experience or maybe he is trained by the businessman for whom he is working currently. Similarly businessmen gets involved in special type of social activity which has potential to get the business and this 'lucrative social activity' is called business networking.

Keywords: Interaction, Social Activity, Resilience, Networks

INTRODUCTION

It is no more a situation where deals were made behind the close doors between a customer and one of the few businessman who flourished with limited customers and huge margins because the details of deal were sacred and the customer had limited access to the knowledge in arriving at some conclusion related to the actual cost of the product or services and also that he had only few choices available as far as his requirements were concerned. The deals are no more secret or sacred. Also there are numerous manufacturers / suppliers / dealers from which a choice is to be made. Where will then a customer go? From which manufacturer / supplier / dealer will he buy the product? What factors would help him / convince him to buy a product from a particular businessman? Here comes the crucial role to be played by 'Business Networking' and 'Relationship Building' which has become a key marketing initiative. According to Wikipedia, 'Networking is a socioeconomic business activity by which business people and entrepreneurs meet to form business relationships and to recognize, create, or act upon business opportunities, share information and seek potential partners for ventures'.

OBJECTIVES OF THE STUDY

1. To study rationale behind business networking and relationship building.

2. To study the scope of business networking and relationship building in modern day business modules.

3. To study the various features and aspects of business networking and relationship building.

4. To study the challenges faced by modern day business networking and relationship building exercises.

5. To recommend measures to make business networking and relationship building more effective.

REVIEW OF LITERATURE

In an Article created by Rukhsana Eisa on 04.07.2015 (Appeared in Entertainment Times page of Bombay Times which is supplementary of The Times of India), titled '17 networking tips of successful people' she says that - Networking is a way for you to make the maxim, and It's not what you know, it's who you know.' work for you. The author of the article further states that, "Networking brings with it the added advantage of recommendation and personal introduction, which are always very helpful for developing business opportunities. Many of the behavioral principles apply to both social as well as business networking." Commenting on quick tips for efficient networking she says that the hardest part is 'breaking the ice' so start out by finding the friendliest face around. She stresses to communicate with ears and advises to start with asking what brings him or her to that party (networking). She also advises to stay away from religion and politics, take

a friend along for company, ask open ended questions, maintain eye contact, greet with handshake, give only brief and basic introduction, carry business card, do not ever ask for free advice from professionals like doctors and lawyers and as a follow up send an email to new contact expressing pleasure over the meeting. She also emphasizes on early arrival for the meeting, be well groomed and clean, and to adopt a "can do" attitude, be flexible and give credit to everyone who made a contribution to a project or event and don't differentiate people by position or standing in a company as it is simply unprofessional. Ravi Teja Sharma (from the Economic Times Bureau - 27.02.2011) quotes founder and chairman of business networking organisation BNI, Mr Ivan Misner who once said that 'Networking is about long-term relationships'. He further says that when you go for your next business meeting, listen for referrals rather than selling yourself first up. Mr. Ivan gives very interesting answers to three most basic questions on Business Networking: 1. How does referral marketing work? How do you define business networking? BNI is a global organisation which helps people give each other referrals for business. Referral marketing works when an associate, friend, client or supplier has a need that can be met by someone you know and trust. You mention to them that you know someone who can help them and you connect them. We teach people how to listen for referrals. 2. What are the strategies for building up one's network? To build a network you need to have two things in place. The first is a networking mindset where you are open to connecting and developing relationships with people. Developing relationships where one adds value is one of the most important things a good networker can focus on. The other important aspect is the networking skill set. The challenge is that our education system does not teach people how to network. People may be doing MBAs but we still don't teach them how to network. 3. How has Internet and more recently social networking sites such as Facebook and LinkedIn changed networking? People often mistake that it's either choosing between face-to-face networking or online networking/social media. However, both are necessary. Recently, I was in Stockholm in Sweden and a journalist had driven about an hour and a half to interview me. He lambasted me saying that face to face networking is dead. Everything is moving online. I asked him whether he conducts any interviews face to face? He said sure. And they were better interviews as there was more he could learn about a person when he met them face-to-face. So then he had his light bulb moment. In an Article 'The relationship between networking practices and business excellence: a study of small to medium enterprises (SMEs)' published on 01.6.2003 in RG

Journal 'Measuring Business Excellence' (ISSN: 1368-3047 - Vol. 7 No. 2, pp. 78-92), Mile Terziovski states that: "Small to medium enterprises (SMEs) are often perceived as a fertile area for the formation of effective networks. However, research to date has focused primarily on large companies. There seems to be a lack of rigorous research reported in the literature that tests the relationship between networking practices and business excellence. Quantitative data was gathered from a stratified random sample of SME site managers in the Australian manufacturing industry. A total of 550 manufacturing sites were sent the questionnaire from which a response rate of 20 percent was achieved. Networking practices regression (NPR) models were developed in order to test the strength of the relationship between key components of networking practice and several dimensions of business excellence such as success rate of new products, reduction in waste, increased market opportunities, etc. The data was analyzed using techniques available on the statistical package for social sciences (SPSS) for Windows software package. The paper concludes that groupings of network practices are required to explain business excellence. This means that a single networking practice is not sufficient to explain business excellence significantly.

RESEARCH METHODOLOGY

The proposed study mainly is descriptive in nature. The study is based on secondary data collected from reputed articles of research journals, books, and prominent sites, documents of various ministries / departments and organizations in order to analyze and understand business networking and relationship building as a key marketing initiative.

LIMITATIONS

The opinions expressed and conclusions drawn in this research study and its analysis does not have the base of any primary data collected owing to the limited time. Hence, the research study was limited to the secondary data available in journals, magazines, publications, articles, research papers and websites only.

FINDINGS

The existing trend in business networking and building relationship shows that it is indeed considered by today's businessman as key elements for marketing goods and services and that is the reason that increasing number of firms are now depending on business networking and building relationship. The networking idea is marketed as an opportunity to grow one's business and it boasts of credible business references. The famous business networking firm BNI claims that in the previous year, their members exchanged more than 5.5 million business references, totalling well over $2.2 billion in new business. Certain famous and known Networking firms invites only one person from one type of business to join their particular chapter / branch. Also the networking firms bank upon mouth to mouth and personal publicity for enhancing their business to grow. According to people involved with Business Networking, it is high time that the institutes of repute start Networking Certificate Course, which can letter be expanded as Diploma Course and Post Graduate Diploma Course so as to ultimately result in developing Degree course in business networking. This is due to the fact that there are more and more opportunities because every sector is in need of networking. It applies to their business one way or the other. The modern techniques used in the business is put to optimum use only when the staff is equipped with networking skills. In line with advanced technology and automation processes, the methods of business networking is also changing and it is trying to keep pace with all the technical developments. The business networking and attempts to building relationship leads to innovations which can lead to better products and services and better facilities to employees, which is always a concern for Human Resource Department. Business Networking gives an ample rise to the employment opportunities. As a sub process, preparation

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for networking requires routing, switching etc. which are considered as a base and foundation for the networking. The qualified persons are hired in this business. Also staff is required to protect the data which is the most vulnerable aspect otherwise. The networking is considered to be useful not only at corporate levels but it is increasingly used by small businessman and even by the educational institutions. The one who has got the stamp of being trained at leading training institution in networking, ensures global career for himself. Cisco certified professional is the best example for this. The scope of job for networking engineer is unlimited even in India. Top IT companies are just ready to welcome professionals. The networking events earmarks a certain day as a special designated day, where they allow even visitors to attend the event. One of the day is purposely declared as a special day for the networking event and a lucky draw is also made to give a prize, which can go even to the non-members. The height of this 'free entry' to the event is that this exercise can be called as marketing of business networking. The business thrives upon business networking and relationship building particularly for those whose advertising and marketing budgets are limited and though the products are standard and of an excellent quality, the sales would not show any healthy growth sign without key marketing initiatives. For such businessman, business networking and relationship building comes as a handy tool. People become members of certain networking groups and meet at a certain pre decided place and time and attempt to get the business from within the group which is now known to be called as 'Business Networking' – another attempt at building relationship.

CONCLUSIONS AND SUGGESTIONS

The business networking and customer relationship exercise ensures some economic leverage but it does not result into equal surge in social relationship. Networking ensures introduction of new parties which leads to increased turnover and resultant profit. It proves to be more beneficial to new ventures in tune with the need of new businessmen. Whenever networking results into new parties being included in the portfolio, it invariably results into slowdown and or weak relations with the existing parties. Also, if new products are introduced after successful networking, the business relations with the existing parties almost comes to an end. The resultant social and business relations with existing parties is surely affected after networking. Those business ventures toying with the idea of innovation in product may try their luck first with networking and business may bloom again with the current product and this results into postponing the idea of innovation. Hence business networking and building relationship as a key marketing initiative may turn out to be bliss for an industry. Networkers should concentrate on quality contact and for this purpose as even one good contact earned during networking session is far better than other fifty with whom you exchanged the business cards. While talking to one contact and in the middle of the dialogue, people try to focus on another contact simultaneously, which the present contact would smartly understand. This should be avoided at any cost. To make effective contact, describe your competitive advantage, and describe what you do is difficult for others to do and then ask you contact his side of story. To be successful, networkers should try to select only a very few contacts, should use their discretion and be alert with full mindfulness.

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