

# **PIMT**

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# **PUNJAB INSTITUTE OF MANAGEMENT & TECHNOLOGY**

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## **AIMS AND SCOPE**

The PIMT Journal of Research (PIMT JR), a peer-reviewed refereed journal, started in March, 2008 is the Quarterly publication of the Punjab Institute of Management and Technology, Khanna. The main aim of this journal is to disseminate knowledge and information in the multidisciplinary areas. The journal focuses on pure empirical, applied and interdisciplinary research in different areas. The journal is intended to provide forum for debate and deliberation for academics, policy planners, and research students of MBA and MCA programs. The PIMT Journal of Research publishes articles, research papers, abstract of doctoral dissertations, book reviews, case studies, short communications and bibliography in multidisciplinary or allied areas.

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## **From the Editor's Desk**

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I am pleased to place before the readers this issue **Vol-13, No.3 (A) (April-June)** of PIMT Journal of Research (UGC Care listed Journal), a publication of Punjab Institute of Management and Technology, Village Alour, Khanna. The response from the contributors of research articles has been overwhelming. The PIMT Journal of Research presents an academically proficient blending of research articles, short communications, book reviews and doctoral dissertation abstracts. The significance of Management and Information Technology has become very well founded all over the world. These fields are witnessing rapid challenges and changes in the face of globalization forcing researchers, academicians and practicing managers to keep them updated on the latest advances in multidisciplinary areas. To promote exchange of ideas among the scholars and practicing managers in the field, PIMT has launched the PIMT Journal of Research. The Journal reflects a keen interest and sustained efforts of researchers, academicians and professionals who have covered wide spectrum of contemporary issues in multidisciplinary & its allied areas. We appreciate the efforts put in by the researchers in terms of quality research work done by them and versatility in the methodology adopted in their research work.

We also express our gratitude to the reviewers of the various articles and contributors of the doctoral dissertation abstracts for giving their valuable contributions, comments and the suggestions for the enrichment of this journal. I thank and look forward to their continued association and support to PIMT Journal of Research.

Our commitment to the cause of promoting high quality research work in multidisciplinary areas that will contribute to enlighten our readers in the times to come.

The Chairman Sh. Naresh Aggarwal, President Sh. Raj Kumar Goyal, Secretary Sh. Nitin Saggar, and other members of Governing Council of the Institute have taken the keen interest in this academic endeavor. I am extremely grateful to them for their continued guidance and support.

***Dr. Manisha Gupta***

*Editor-in-Chief*

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## **IMPACT ASSESSMENT OF COVID-19 (PANDEMIC) ON SELECTED PLAYERS IN ORGANIZED HOSPITALITY & TOURISM SECTOR IN INDIA AND ROADMAP FOR THEIR RECOVERY**

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### **ABSTRACT**

*Hospitality and Tourism sector in India accounts for more than 7.5% of the Gross Domestic Product (GDP) and as of 2019, about 4.2 crore jobs were created in the Tourism sector in India alone as per an estimate of India Brand Equity Foundation (March, 2020) which was 8.1% of total employment in the country. Further, importance of this sector can be gauged from the fact that in the Travel and Tourism Competitive Index (of World Economic Forum), India has moved up from the 65<sup>th</sup> rank in the year 2014 to 34<sup>th</sup> rank in the year 2019. Foreign exchange earnings of this sector, in January 2019, i.e., just prior to the spread of COVID-19, were Rs. 1.88 lakh crore. Every sector in Indian economy got affected due to COVID-19 but Hospitality & Tourism Sector has seen significant job loss estimated around 38mn which is almost 70% of the total workforce. Impact on Hospitality & Tourism Sector in India is such that it was the first one to get disrupted due to pandemic and will be the last one to see a resumption of activities.*

*In the present paper, the impact of COVID-19 on listed companies of Hospitality & Tourism Sector which are part of BSE-500 Index has been analysed. An attempt has been made to suggest the recovery roadmap as devised by these affected companies to deal with the prevailing situation and as observed from overall analysis.*

**Key words:** - Pandemic, Hospitality and Tourism, Job Loss, Travel and Tourism Competitive Index

### **INTRODUCTION**

Hospitality Sector is very broad and has many sub-sectors. It covers accommodation (Bed and Breakfast or B&B), Hotels, Motels, hostels, resorts, serviced apartments, time-sharing), Food and Drink (Restaurants, takeaway/catering, bars and cafes – coffee, tea, snacks, alcohol, night clubs, tea & coffee shops), Travel and Tourism (Airlines, travel agents, tour operators, Online travel agencies, cruises covering lodging, catering and entertainment, car rentals, trains, buses, casino covering live show, food and drinks, or connected to hotels, recreation covering movie theatres & amusement parks, and companies in hospitality technology. Many new sub-segments are emerging within each sub-sector, e.g., space tourism under Tourism.

In each sub-sector, many developments are taking place due to COVID-19. For example, fewer people are likely to travel or able to travel due to travel restrictions has direct impact on Travel and Tourism. Businesses are incurring losses so job security is an issue so it is likely to affect booking for holidays for 2020/2021. Many local, national and international events have been cancelled or postponed, e.g., Olympics, so that will affect travel and tourism.

COVID-19 has compelled the policymakers to grapple with trade-off between public safety and reviving economies. The question is: Lives vs. Livelihoods.

### **HOSPITALITY AND TOURISM INDUSTRY IN INDIA: CURRENT SCENARIO**

The following are the major issues involved in the Hospitality and Tourism Industry in India:

#### **1. Uncertain Environment:**

At present, the sector is facing an uncertain environment. It is almost impossible to make even contingency plans for the future by drawing up business hypotheses (volume, duration) to make a plan for getting through the current situation. For a hotel or an airline, it is much harder to arrange for staff to work from home. Ultimately, it is going to be toss-up between three scenarios, i.e., 'a V-shaped recovery', 'a U-shaped recovery' or 'an L-shaped recovery'. On the basis of the recovery path, contingency plans can be drawn up. Moreover, from existing relaxation given to various sectors, 'essentiality' formed the core basis, e.g., the case of pharmaceuticals and food processing. It is the fact that the hospitality and tourism

sector is ‘labour intensive’ and also, ‘export intensity’ is less so full-fledged opening, and operation is not feasible in short-run.

## 2. Unemployment:

The Federation of Associations in Indian Tourism and Hospitality (FAITH), the national federation of ten national tourism, travel and hospitality organizations of India cited the potential job loss of around 38 million in the sector. It forms 70% of the total workforce in this sector. However, the World Travel and Tourism Council estimates that the tourism industry stands to lose 50 million jobs and see a 25% decline in global travel. A substantial number of job losses are expected for persons working in restaurants, bars, airlines and cruises, online and traditional travel companies, ground agents, event management companies, and transporters, among others. The industry is largely dependent on masses of people travelling around the world and millions within cities, who use restaurants and bars. Majority of workers in tourism industry have no steady income as they are in the informal sector and a lockdown would mean the loss of their livelihoods. Lockdown has severely hit them. There will be severe economic hardships

for all of them. The industry is literally facing an “existential crisis”.

## MAIN OBJECTIVES OF THE RESEARCH PAPER:

Main objectives of the research paper are as follows: -

1. To assess the impact of COVID-19 (pandemic) on the selected players in organized hospitality and tourism sector in India
2. To identify measures undertaken by the Government or government agencies to support organized hospitality and tourism sector in India
3. To suggest the roadmap for the recovery of the hospitality and tourism sector on the basis of actions of organized players in hospitality and tourism sector in India and specific trends in this sector

## METHODOLOGY

For this study, the companies which are part of the BSE-500 index and falls under the Hospitality Sector have been covered. As on July 31, 2020 the listed companies which are part of BSE-500 and fall under the Hospitality and Tourism Sector are as follows: -

**Table No.1**

Name of the Company	Industry
Balmer Lawrie & Co. Ltd.	Diversified (with presence in corporate travel)
EIH Associated Hotels Ltd.	Hotel, Resorts and Restaurants
Indian Tourism Development Corporation	Hotel, Resorts and Restaurants
Indian Hotels Company Limited	Hotels, Resorts and Restaurants
Interglobe Aviation Limited (operates Indigo)	Airlines
Indian Railway Catering and Tourism Corporation (IRCTC)	Misc. Commercial Services
Lemon Tree Hotels Limited	Hotels, Resorts and Restaurants
Mahindra Holiday & Resorts India Limited	Hotels, Resorts and Restaurants
Quess Corp Limited	Misc. Commercial Services
SIS	Misc. Commercial Services
SpiceJet Ltd.	Airlines
TeamLease Services Ltd.	Misc. Commercial Services
United Breweries Ltd.	Breweries & Distilleries
Westlife Development Ltd.	Hotels, Resorts and Restaurants

## ANALYSIS AND INTERPRETATION: -

1. **Organized Hospitality and Tourism is the “least dependent on the banking sector” and is “self-reliant” for sustainability: -**

Tourism/hotels/restaurants as Industry in India is “least dependent” on the banking sector and is “self-reliant” for its own growth as is evident from the amount owed by various industries to the banking sector in India: -

**Table No.2: Key Industries Impacted due to COVID**

Industry	Amount owed to the banking sector (In Rs. Trn)
Retail trade	2.87
Wholesale trade	2.55
Roads	1.94
Textile	1.89
Engineering	1.18
Petroleum, Coal Production	0.73
Ports	0.64
Cement	0.57
Chemicals	0.54
<b>Tourism/hotels/restaurants</b>	<b>0.46</b>

**Source:** Roy, Anup, SomeshJha and AbhijitLele, “Kamath panel identifies 26 stressed sectors, outlines rules for recast”, Business Standard, September 09, 2020

### 3. Drastic Reduction in the Revenue: -

All sub-sectors of the Hospitality and Tourism Sector in India have suffered badly due to the pandemic. Hoteliers are faced with drastically reduced incomes and substantial fixed costs which remain unchanged (wages, credits and any loans). A sudden drop in revenue has posed them a variety of challenges. Occupancies have come to single digit and even recovery is not expected in near future. At an all-

India level, by the third week of March 2020 itself, this sector witnessed a decline of more than 65% in occupancy level in comparison to the same period of the previous year. Cancellation of bookings, no new bookings and demands for full refunds have affected the sector's revenue. For April-June quarter of 2020, the Indian tourism industry is likely to book a revenue loss of Rs. 69,400 crore which comes to 30% year-on-year loss. For calendar 2020, projected revenue loss is to the tune of Rs. 1.25 trillion.

**Table No.3**

Company	Net Profit Ratio (June 30,2019)	Net Profit Ratio (June 30,2020)
Balmer Lawrie & Co. Ltd.	5.10%	(3.26%)
EIH Associated Hotels Ltd.	0%	(448.27%)
Indian Tourism Development Corporation	0%	(53.57%)
Indian Hotels Company Limited	0.98%	(186.01%)
Interglobe Aviation Limited (operates Indigo)	12.77%	(371.27%)
Indian Railway Catering and Tourism Corporation (IRCTC)	15.69%	(18.32%)
Lemon Tree Hotels Limited	(0.71%)	(147.5%)
Mahindra Holiday & Resorts India Limited	0%	(10.88%)
Queso Corp Limited	2.24%	1.95%
SIS	3.83%	2.68%
SpiceJet Ltd.	8.73%	(115.16%)
TeamLease Services Ltd.	1.52%	1.50%
United Breweries Ltd.	8.01%	(9.03%)
Westlife Development Ltd.	(0.26%)	(64.52%)

(Source: Compiled by authors by taking relevant data from moneycontrol.com)

### 4. Default on the Loans and difficulties in compliance on loan covenants:

Unorganized hospitality and tourism industry is more prone to default on the repayment of loan and mortgage instalments. In the organized sector also, lenders' exposure to the sector is at risk. Exposure at risk can be gauged from the fact that the 65 listed companies in 'travel and hospitality sectors' had a combined outstanding loan amount of around Rs. 30,500 crore by the end of September

2019. This amount was around Rs. 22,200 crore at the end of September 2018 so there was the jump of 37.2% in one year alone. Since it included airline sector as well and if we take into account only hotel chains such as Chalet Hotels, Lemon Tree Hotels, Asian Hotels (North), Indian Hotels then it accounted for around 50% of the combined borrowings. Smaller chains are considered more vulnerable in comparison to their large peers. Interest Coverage Ratio of smaller chains is generally lower.

**Table No.4: Interest Coverage Ratio for selected Hotel Chain Groups**

Name of the Hotel Chain	Interest Coverage Ratio	Total Debt (in Rs. Cr.)	Gross Leverage Ratio
Lemon Tree Hotels	1.7x	1285.1	1.6
Asian Hotels (North)	0.6x	1183.3	1.7
Indian Hotels	3.3x	3503.2	0.9
EIH	6.5x	687.4	0.2
Mahindra Holiday	4.8x	1772.2	9.2

**Source:** Kant, Krishna, "Coronavirus spread: Banks' exposure to travel, hospitality sectors at risk", Business Standard, March 20, 2020

Decreased revenue has affected compliance with loan covenants or conditions. Loan to Value Ratio(LTV)measures the amount of risk a lender is willing to assume. The lower the LTV, the lower is potential that the lender will suffer a loss. Revenue or earnings are the core determinants of the operations of a player in hospitality sector. As revenue and earnings of the industry have dropped, so the value has come down. It has led to difficulties in compliance of loan covenants.

**Roadmap for the recovery of the hospitality and tourism sector on the basis of actions of organized players in hospitality and tourism sector in India and specific trends in this sector:**

Recovery roadmap for the hospitality and tourism sector requires interventions from organized sector players as well as liberal support from the government and government agencies. These suggestions are as follows: -

**(A.) Recommendations to the Government:** -Rs. 20 Lakh Crore ‘Stimulus package’ was announced on May 13, 2020 by Smt. Nirmala Sitharaman. This stimulus package targeted various sectors. But these measures did not offer help to tourism and hospitality sector. The measures desired to be undertaken from the government side are given below: -

#### 1. Waiver/Relaxations in License and Permit Renewal Fees:

State governments should reduce taxation on the hospitality industry and reduce the costs of bar licenses, application fee for a new licence, licence fee which hotels pay every year. Such fees need waiver or relaxation. Waiver can be on pro rata basis or relaxation can be in the form of moratorium on payments for a particular period. The following example clarifies fees payable by hotels and clubs for bar licences in case of Tamil Nadu:

**Table No.5: Fees payable by hotels and clubs for bar licences in Tamil Nadu**

Grade of hotel	Application fee (In Rs.)	Licence fee (In Rs.)	Privilege fee (In Rs.)
Five-star	7,500	25,000	20,00,000
Four-star	7,500	25,000	12,00,000
Three-star	7,500	25,000	8,00,000
Two-star	7,500	25,000	6,00,000
One-star and others	7,500	25,000	5,00,000

**Source:** Kandavel, Sangeetha, “Tamil Nadu: State government hikes bar licence fees for hotels, clubs”, the Hindu, February 19, 2019

#### 2. Financial Support from Govt.:

Government will have to play an active role in reshaping and reinventing this industry for its revival. It is hard for the companies and firms to manage cash flow even in the post lockdown period. So Govt. may set up some fund to support basic salaries in hospitality sector. Affected persons can be given ‘direct benefit transfers’.

#### 3. Economical Refinancing:

The government should put in all the financial resources necessary in order to prevent companies going defunct. It should be allowed to arrange refinancing at nominal interest rate for the payment of a year’s worth salary and wages to employees. Interest on interest must not be levied for the given period on the loans for which interest was not paid from March 2020 onwards.

#### 3. Subsidized Electricity and water or deferment of charges for a specific period:

Waiver of electricity bills for the hospitality sector will result in saving the money that can be used to support employees with salary and help avoid layoffs. Conditional waiver is possible. Alternatively, dues may be deferred for a specific period. Moratorium of six months can be helpful for players in the hospitality sector.

#### 4. Relaxations in Taxation and other statutory dues:

There should be deferment of dues such as advance tax, GST( Goods and Services Tax) for at least a year. The funds should be sanctioned to reimburse Provident Fund (PF), Employee State Insurance (ESI) related dues towards ESIC, professional tax etc.

Recommendations to the Players in the Hospitality Sector:-

#### 1. Technological Interventions:

Technology will have to be adopted in order to minimize any business interruptions. Holographic ordering, Keyless entry and Flippy Kitchens should be used to the maximum extent in order to avoid physical touch while keeping in mind the hygiene part.

#### 2. HR Interventions:

Every organization in the study has focused on HR Interventions. Some of the reputed hotel chains (except one, others were not part of the study) have shown the way forward. They did not lay off their employees. These entities announced pay cuts for their leadership teams. Pay-cut at higher levels and lowering the facilities to employees can help contain the cost and also to retain employees. Hospitality and Tourism sector needs to “reinvent” and “reconfigure”.

#### 3. Strategic Cost Management:

The sector will have to prioritize expenditures, cutting out those non-essential costs while trying to monetize inventory through collaborative efforts with neighbouring resorts, external service providers and wholesalers. In order to attract more customers, incentives such as waiving parking fees or offering discounts may be considered. In the longer-term, expenditures such as major capital projects can be put into abeyance until business begins to pick up again.

#### 4. Predictive Data Analysis:

Predictive Data Analysis can be helpful and can enable the sector to identify: “What travel patterns will like” and “What preferences will look like”. Tourists will

stay in their country, firstly for financial reasons and secondly, because of anxieties regarding travel. Regardless of the lifting of restrictions, consumer spending is bound to be hit, and this includes holidays.

#### 4. Implementation of SOP (Standard Operating procedure):

The hospitality industry needs to provide a safe environment, which is possible by adopting Standard Operating procedure of hygiene and cleanliness so as to provide a safe and hygienic environment.

#### 5. Abiding by the Directions from Health Authorities:

Employers have to pay close attention to local, state and national health department guidance. There should not be compromise on this count. For example, Employee diagnosed with COVID-19 must be reported to the local health department.

#### 6. Changes in Style of Working and new norms for working:

The industry has to ensure change in the ‘style of working’ and have to put in place ‘new norms’ of working in new environment. Companies covered in the study have emphasized on: -

- ✓ Creating and developing a safer working environment.
- ✓ Ensuring ‘safe distancing’.
- ✓ Ensuring ‘less physical touch points’, e.g., serving food at the table rather than at a counter.
- ✓ Operating at lower margin with limited revenue opportunities as well as readiness to bear partial increase in certain elements of cost.

#### 1. Establishing ‘close connect’ with the customer by understanding the ‘pulse’:

There is a need to establish a ‘close connect’ with customers by understanding the ‘pulse’, ‘the usage pattern’, ‘potential usage’, among others. For example, it is expected that millennial are going to become first to start travelling. They are more fearless and more desiring of unique experiences in life. The industry may attract them by offering low prices and include them as an integral component in the business recovery plan.

### CONCLUDING REMARKS

Hospitality and Tourism industry has to build the confidence among the customers that it is “safe distancing” that is required rather than “social distancing”. The Industry has to ensure that “personal-touch oriented service” is required to be modified to “no-contact service”. For this, hospitality and tourism industry will have to redefine and re-imagine itself in more ways than ever.

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## A STUDY ON THE SPECIAL ISSUES OF CULTURAL TOURISM IN KERALA

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### ABSTRACT

*The study proposed a detailed scientific enquiry into the problems of cultural tourism activities in the state of Kerala which also constitute the objective of the study. There are various apprehensions, misbeliefs, over expectations and under estimation of the different aspects of cultural tourism as conceived by the tourists and the local residents. There are problems arising out of these deliberations affecting the effective cultural tourism activities in the state. Of these various problems, issues such as the concept of Paradise, Imperialism, and Host-Guest Relationship merit special consideration.*

**Key Words:** Cultural Tourism, Paradise, Imperialism, Host-Guest Relationship, Tourists

### 1. INTRODUCTION

Cultural Tourism comprise of visits by persons from outside the Host Community motivated wholly or in part by interest in the historical, artistic, scientific, or life styles or heritage offering of a community, region, group or institution. The concept of culture is evolved out of the demands of the majority of tourists to satisfy their cultural inclinations. It also highlights the responsibilities of travel and tourism agency to operate within the socio-cultural sensitivities of the destinations and thereby providing valuable insights into the various aspects of Cultural Tourism. The cultural heritage and its components gradually transformed as tourism products and became a major attraction and motivation for tourists in different parts of the world to visit such cultural sites. Tourists increasingly say that they want to experience local culture, to live like locals and to find out about the real identity of the places they visit(Richards 2009). Cultural Tourism started as a form of alternative tourism and now-a-days it can be considered in certain tourism destinations as a dominant part of mass tourism.

### 2. OBJECTIVES OF THE STUDY

The contemporary tourism industry is increasingly influenced by various special issues. Melanie K. Smith (2003) states three special issues associated with Cultural Tourism such as (1) Paradise (2) Imperialism and (3) Host-Guest Relation Impact. The influence of these special issues on tourists is observed to be the problems of Cultural Tourism. Hence, a detailed discussion on the problems of special issues of Cultural Tourism constitute the objectives of the study.

### 3. RESEARCH METHODOLOGY

The methodology adopted for the study is given below:

#### 3.1 TYPE OF STUDY

It is a descriptive study wherein the existing situation of the problem is described most scientifically. It explains the situation as it is.

### 3.2. SOURCE OF DATA

Primary data were collected directly from the tourists and host community using structured interview schedule. The secondary data were collected from all available sources

### 3.3 UNIVERSE OF THE STUDY

All the tourists both domestic and foreign who visited the selected sites constitute the universe of the study.

### 3.4 SAMPLING UNIT

One individual tourist constitutes the sampling unit of the study.

### 3.5 SELECTION OF TOURIST SITES

Fourteen tourist places covering all the 7 categories of cultural tourists according to the typology suggested by Melanie K Smith were selected. The 14 major cultural tourist centres were selected based on the tourist arrivals recorded in the Tourist Statistics published by the Department of Kerala Tourism.

### 3.6 SAMPLING TECHNIQUE ADOPTED FOR RESPONDENTS

The samples of tourists are selected by applying non-probability sampling technique.

### 3.7 SAMPLE SIZE ADOPTED FOR THE STUDY

A total of 700 tourists constitute the sample size of the study although the power analysis suggests a lesser sample size owing to the fact that the higher the sample the better will be the results of the study.

### 3.8 TOOL CONSTRUCTION FOR DATA COLLECTION

The studies of Melanie K Smith (2003), Nikolas Boutas (2009), Jin Huh (2002), John B Gatewood and Catherine M Cameron (2009), are used to design the measurement scales because of their relevance and usefulness in the present study. Suitable modifications are made in their scales to suit for the present study.

#### 4. RESULTS AND DISCUSSION

The variables and the results of the analysis are given as under:

##### 4.1 PARADISE OF CULTURAL TOURISM

The term paradise assumes different meaning in different contexts. According to some religions, paradise is a wonderful place where people go after they die if they have led good lives. As a noun paradise refer to a place or situation that seems beautiful or perfect. It can be

stated from the above that paradise is a place when it is felt attractive to a particular kind of persons and has everything they need for a particular activity. Melanie K Smith (2003), states tourists seldom visit a place when the place loses its paradise effect. Inability to present a destination as a paradise becomes a special issue which most of the tourists perceive it as a problem.

The following belief statements or Constructs are used for identifying the problems of Cultural Tourism associated with Paradise of Cultural Tourism as perceived by tourists.

**Table 1 Variables of Paradise**

Constructs	Belief Statements
Construct P1	I am the first to experience a new place, especially a pristine wilderness
Construct P2	This is an experience that is overcome only by becoming the last to see a place before it becomes lost, ruined for all eternity.
Construct P3	I am in search of the most idyllic, unspoilt and untouched destination.
Construct P4	The notion of paradise is often far removed from the reality of a destination
Construct P5	Local people are somehow marginal to the experience of a destination, despite its being their home and them the hosts
Construct P6	There is a clash between the rich, modern world of tourism and the uncomplicated lifestyle of the folk.
Construct P7	My sympathy is with the locals struggling to hang on to their paradise.
Construct P8	That 'each man kills the thing he loves' is certainly true of the tourist
Construct P9	We are all looking for the virgin place, we can deflower the unspoiled site, so that we can be the people to spoil it
Construct P10	In time, paradise found is almost invariably paradise lost

(Source: Adapted from Literature Survey)

The following hypotheses are set based on above constructs:

**H<sub>0</sub>:** Construct P1 to P10 has no effect on Paradise of Cultural Tourism

**H<sub>1</sub>:** Construct P1 to P10 has significant effect on Paradise of Cultural Tourism

The Model Fit Indices for Paradise is given as under in Table 2

**Table 2 Model Fit Indices for CFA –Paradise of Cultural Tourism**

	$\chi^2$	DF	P	Normed $\chi^2$	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Paradise of Cultural Tourism	10.867	11	.454	.988	.999	.993	.997	1.000	1.000	.018	.000

(Source: Primary Data)

All the attributes loaded significantly on the latent constructs. The value of the fit indices indicates a reasonable fit of the measurement model with data. In Table 3 the regression coefficients are presented.

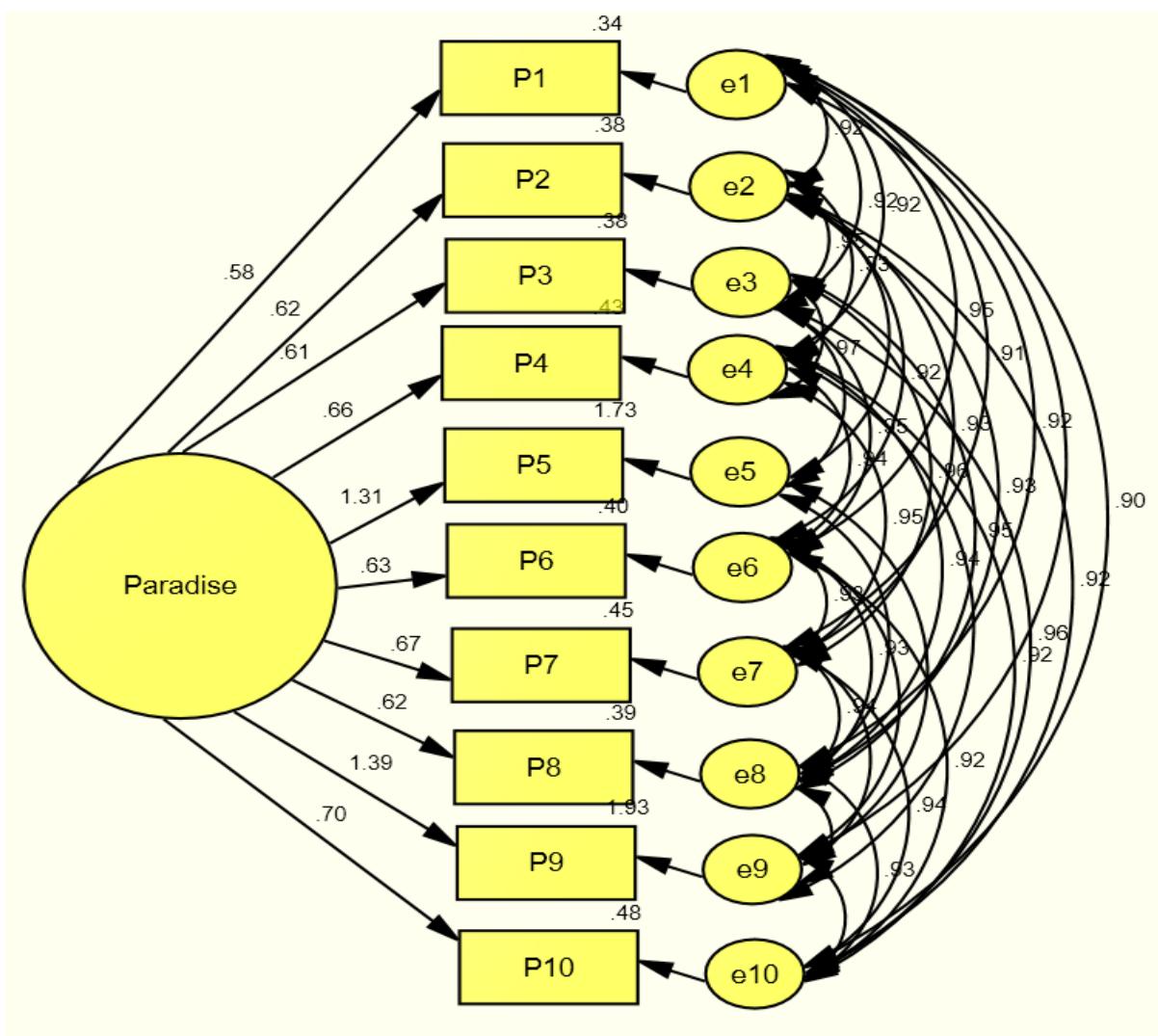
**Table 3 The Regression Coefficients –Paradise of Cultural Tourism**

Factors/ Latent Variables (Dependent Variable)	Construct (Independent Variable)	Regression Coefficient	C.R.	P	Variance explained (percent)
Paradise of Cultural Tourism	P1	0.584	17.649	<0.001	34.2
	P2	0.615	18.927	<0.001	37.8
	P3	0.612	18.800	<0.001	37.5
	P4	0.658	20.838	<0.001	43.3
	P5	1.314	100.328	<0.001	172.8
	P6	0.634	19.750	<0.001	40.2
	P7	0.672	21.500	<0.001	45.1
	P8	0.621	19.184	<0.001	38.6
	P9	1.391	100.328	<0.001	193.4
	P10	0.695	22.640	<0.001	48.3

(Source: Primary Data)

Table 3 shows that all the constructs have regression coefficient value more than 0.4. So all these constructs have significant effect on the special issue of Cultural

Tourism which the tourists like to mention as the problem of Paradise of Cultural Tourism. The pictorial representation of CFA is given in Figure 1.



**Figure 1Path Diagram on Paradise**

#### 4.2 IMPERIALISM OF CULTURAL TOURISM

It is a fact to note that even though tourism interlinks economic, social and cultural networks inter-transnationally, but the influential role in decision making is most often occupied by wealthy European and American

tour operators. The debate about whether tourism is like a new form of Imperialism has been prominent. When tourism turns to be a new form of Imperialism, it is likely to become a problem of Cultural Tourism. The following constructs (Table 4) are used to analyse the problem of Imperialism

**Table 4Variables of Imperialism**

Constructs	Belief Statements
Construct IMP1	Tourism is, and will remain for the foreseeable future, dominated by Western developed nations, rendering host nations dependent and subservient to its needs
Construct IMP 2	Tourism still flows predominantly from the developed to the developing world.
Construct IMP 3	The majority of the world's population will never have the chance to venture outside their country, nor perhaps even their home town or village

(Source: Adapted from Literature Survey)

The hypotheses based on the above constructs are formulated as follows:

**H<sub>0</sub>:** Constructs Imperialism 1 to Imperialism3 have no significant effect on Imperialism of Cultural Tourism.

**H<sub>1</sub>:** Constructs Imperialism 1 to Imperialism3 have significant effect on Imperialism of Cultural Tourism

**Table 5 Model fit Indices for CFA –Imperialism of Cultural Tourism**

	$\chi^2$	DF	P	Normed $\chi^2$	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Imperialism of Cultural Tourism	.000	0	.000	0	1.000	.000	1.000	.000	1.000	.000	.307

(Source: Primary Data)

All the attributes loaded significantly on the latent constructs.

The value of the fit indices indicates a

reasonable fit of the measurement model with data as given in Table 5

In Table 6 the regression coefficients are presented below:

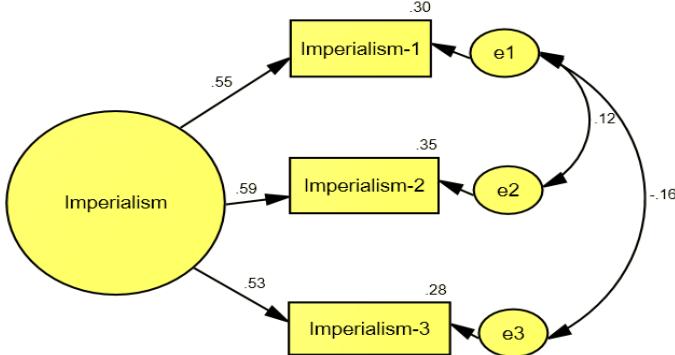
**Table 6 The Regression Coefficients –Imperialism of Cultural Tourism**

Factors/ Latent Variables (Dependent Variable)	Construct (Independent Variable)	Regression Coefficient	C.R.	P	Variance explained (percent )
Imperialism of Cultural Tourism	Imperialism 1	0.550	16.326	<0.001	30.3
	Imperialism 2	0.589	17.850	<0.001	34.6
	Imperialism 3	0.529	15.544	<0.001	28.0

(Source: Primary Data)

In this case all the constructs have regression coefficient value more than 0.4. So all the three constructs have significant effect on the special issues of Cultural Tourism

called the problem of Imperialism of Cultural Tourism. The pictorial representation of CFA on Imperialism is given in Figure: 2.



**Figure 2 Path Diagram on Imperialism**

4

### **.3 HOST-GUEST RELATION AND ITS IMPACT ON CULTURAL TOURISM**

The influx of Cultural Tourists to a destination is observed to be affecting the Host-Guest Relationship in the destination country. The behavior of affluent tourists in a destination may develop a feeling among local community that their role in tourism sector is limited to menial jobs as

servants or guides or companions. Any development of Cultural Tourism that is likely to affect the host guest relationship is considered to be a problem of Cultural Tourism.

The following constructs (Table 7) are used to analyse the problem of Host-Guest Relation and its impact on Cultural Tourism as perceived by tourists:

**Table 7 Variables of Host-Guest Relation**

Constructs	Belief Statements
HGRI 1	Many of these destinations now find themselves languishing at the stagnation or decline phase of the resort lifecycle
HGRI 2	Their people are often disenchanted, and rarely choose to retain their homes in the same location as the tourists.
HGRI 3	It is common for tourists to be confined to 'enclaves' where contact with local residents is minimal.
HGRI 4	Socio-cultural impacts can be managed more easily, as host-guest contacts are minimal and controlled
HGRI 5	It is worth questioning how far host-guest relations have ever been truly authentic given the contrived nature and typically short duration of the average holiday.
HGRI 6	In many destinations, the problems of all-inclusive holidays have been a major cause for concern

(Source: Adapted from Literature Review)

The hypotheses formulated are the following:

**H<sub>0</sub>:** Constructs Host-Guest Relation Impact1 to Host-Guest Relation Impact 6 have no effect on Host-Guest Relation Impact

**H<sub>1</sub>:** Constructs Host-Guest Relation Impact 1 to Host-Guest Relation Impact 6 have significant effect on Host-Guest Relation Impact

**Table 8 Model Fit Indices for CFA – Host-Guest Relation and its impacts on Cultural Tourism**

	$\chi^2$	DF	P	Normed $\chi^2$	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Host-Guest Relation Impact	.000	0	.000	0	1.000	.000	1.000	.000	1.000	.000	.307

( Source: Primary Data)

All the attributes loaded significantly on the latent constructs. The value of the fit indices indicates a reasonable fit of the measurement model with data as given above in Table 8

In Table 9 the Regression Coefficients are presented.

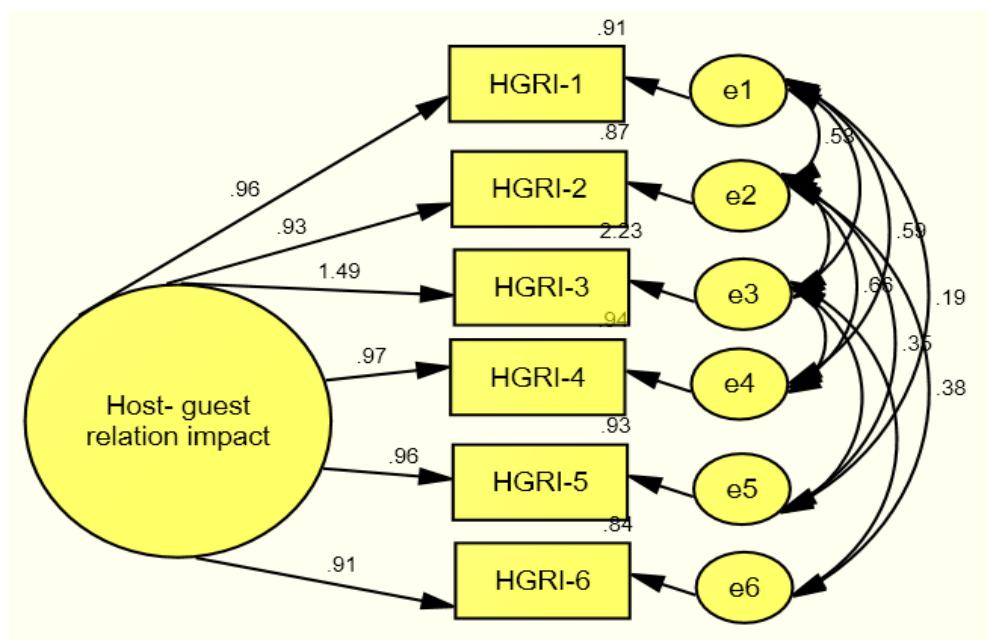
**Table 9The Regression Coefficients –Host-Guest Relation and its Impact on Cultural Tourism**

Factors/ Latent Variables (Dependent Variable)	Construct (Independent Variable)	Regression Coefficient	C.R.	P	Variance explained ( percent )
Host-Guest Relation Impact	HGRI 1	0.956	50.088	<0.001	91.4
	HGRI 2	0.934	44.587	<0.001	87.3
	HGRI 3	1.493	100.328	<0.001	222
	HGRI 4	0.968	54.373	<0.001	93.6
	HGRI 5	0.963	52.423	<0.001	927
	HGRI 6	0.915	41.117	<0.001	83.7

( Source: Primary Data)

The details given in Table 9 indicate that all the constructs have regression coefficient value more than 0.4. Hence, all these constructs have significant effect on the problem of

Host-Guest Relation and its impact on Cultural Tourists. The pictorial representation of CFA on Host-Guest Relation Impact is given in Figure: 3.



**Figure 3 Path Diagram on Host –Guest Relationship**

## 5. SUMMARY OF FINDINGS -SPECIAL ISSUES OF CULTURAL TOURISM-COMBINED EFFECT- FULL MODEL

An analysis is also undertaken in order to give a concise view about the problems of special issues of Cultural Tourism. The following hypotheses are set for ascertaining the combined effect of Paradise of Cultural Tourism,

Imperialism of Cultural Tourism and Host-Guest Relation Impact

H1: Paradise of Cultural Tourism has a positive influence on Special Issues related to Cultural Tourism.

H2: Imperialism of Cultural Tourism has a positive influence on Special Issues related to Cultural Tourism.

H3: Host-Guest Relation has a positive influence on Special Issues related to Cultural Tourism.

**Table 10 Model Fit Indices for CFA- Special Issues related to Cultural Tourism**

	$\chi^2$	DF	P	Normed $\chi^2$	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Special Issues related to Cultural Tourism	.000	0	.000	0	1.000	.000	1.000	.000	1.000	.000	.274

(Source: Primary Data)

All the attributes loaded significantly on the latent constructs. The value of the fit indices indicates a reasonable fit of the measurement model with data as shown in Table 10

The Regression Coefficients are presented in Table 11.

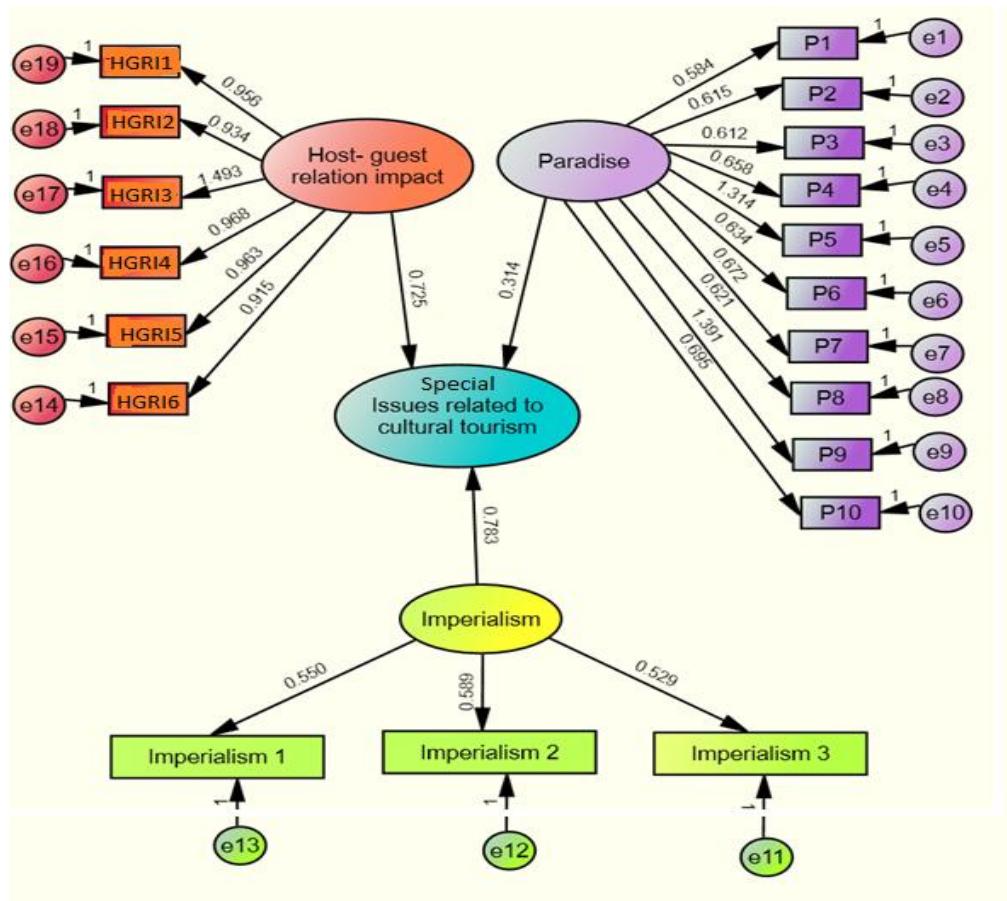
**Table 11 The Regression Coefficients – Combined Effect**

Path	Estimate	Critical Ratio (CR)	P	Variance explained
Paradise of Cultural Tourism →Special Issues of Cultural Tourism	0.314	8.580	<0.001	9.8
Imperialism of Cultural Tourism →Special Issues of Cultural Tourism	0.783	27.802	<0.001	61.4
Host-Guest Relation Impact →Special Issues of Cultural Tourism	0.725	24.239	<0.001	52.5
P1 → Paradise of Cultural Tourism	0.584	17.649	<0.001	34.2
P2 → Paradise of Cultural Tourism	0.615	18.927	<0.001	37.8
P3 → Paradise of Cultural Tourism	0.612	18.800	<0.001	37.5
P4 → Paradise of Cultural Tourism	0.658	20.838	<0.001	43.3
P5 → Paradise of Cultural Tourism	1.314	100.328	<0.001	172.8
P6 → Paradise of Cultural Tourism	0.634	19.750	<0.001	40.2
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P9 → Paradise of Cultural Tourism	1.391	100.328	<0.001	193.4
P10 → Paradise of Cultural Tourism	0.695	22.640	<0.001	48.3
Imperialism 1 → Imperialism of Cultural Tourism	0.550	16.326	<0.001	30.3
Imperialism 2 → Imperialism of Cultural Tourism	0.589	17.850	<0.001	34.6
Imperialism 3 → Imperialism of Cultural Tourism	0.529	15.544	<0.001	28.0
HGRI 1 →Host-Guest Relation	0.956	50.088	<0.001	91.4
HGRI 2 →Host-Guest Relation	0.934	44.587	<0.001	87.3
HGRI 3 →Host-Guest Relation	1.493	100.328	<0.001	222
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HGRI 5 →Host-Guest Relation	0.963	52.423	<0.001	927
HGRI 6 →Host-Guest Relation	0.915	41.117	<0.001	83.7

(Source: Primary Data)

The results reveal that the regulatory construct Paradise of Cultural Tourism has no significant influence on Issues related to Cultural Tourism as the standardized direct effect of this construct on issues was 0.314, which is less than the recommended value of 0.4. Hence the hypothesis is rejected. The regulatory construct Imperialism of Cultural Tourism has significant influence on Issues related to Cultural Tourism with a value of 0.783 and the hypothesis

is accepted. The regulatory construct Host-Guest Relation has significant influence on Issues related to Cultural Tourism as the standardized direct effect of this construct on Issues was 0.725, which is more than the recommended value of 0.4. So the hypothesis stating that Host-Guest Relation has a positive influence on Special Issues related to Cultural Tourism is accepted. The diagram of the combined model is given in Figure 4



**Figure 4 Special Issues(combined) related to Cultural Tourism**

## 6. CONCLUSION

The conclusion of the study is on the following lines:

The analysis of Special Issue of Cultural Tourism – Combined Effect reveals the findings as; Paradise of Cultural Tourism has no influence on Special Issues related to cultural tourism. The Imperialism of Cultural Tourism has influence on Special Issues related to cultural tourism. Host-guest relation has significance influence on Special Issues related to cultural tourism. Further the variables of Imperialism and Host-Guest Relationship are proved to be the strong predictors of the respective issues while the variables of Paradise exhibit different result when treated alone and in combination.

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## ETIOLOGY OF CHILD LABOUR: ECONOMIC CONSTRAINTS AND JURISPRUDENTIAL NECESSITY

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### ABSTRACT

*The children need to be protected from all kind of exploitation, moral and material abandonment. They need to be provided with opportunities to education and development as per the constitutional mandate. But inspite of all these guidelines children have to work during their tender years. The guidelines in different legislations are not taken care of and the children are made to work for longer hours with lesser wages. So, the paper analyses the etiology of child labour wherein all the major factors contributing to the problem are discussed. The mandate of Child Labour (Prohibition and Regulation) Act, 1986 are discussed alongwith the latest amendments and the judicial decisions.*

**Keywords:** *Child Labour, Act, Working Hours, Prohibition, Adolescents.*

### INTRODUCTION

Children are one of the most vulnerable classes of the society. This fact was acknowledged and understood by the Constitution makers also. That is why Article 15 of the Constitution was created which justifies the enactment of special laws for the protection of children. Article 24 was especially created to deal with the problem of child labour. Many of principles in Part IV of the Constitution have also been included for the protection of children. But in spite of it, the rights of children have been violated since decades. According to the report of (ILO and UNICEF, 2020) "Child labour reinforces intergenerational poverty, threatens national economies and undercuts rights guaranteed by the Convention on the Rights of the Child".

The International Labour Organisation (ILO) has estimated that in 2015 number of child workers in India is 5.7 million (Haider F., 2016). According to NCRB (National Crimes Records Bureau) report of 2016, a total of 251 cases were registered under the Child Labour Prohibition and Regulation Act, 1986. The analysis of NCRB reveals that out of 251 cases, a significant number that is 53, were the crimes committed against the migrants. Thus, the problem of child labour is one of such diseases which is at its terminal stage inspite of so many legislations to regulate it. So, the paper focuses on the etiology of child labour and examines what are the causes that make this problem invincible. Economic constraints are definitely the major cause of this problem. Further, the number of children employed has been increasing despite so many regulatory attempts of the state. That is why the paper will analyse the jurisprudential concerns attached to the problem.

### DEFINITIONAL ANOMALIES

The definition of child is different in various legislations and that creates a problem for the executors. In general

sense, a child is a person who has not attained the age of 18 years. According to Section 2 (ii) of the Child labour (Prohibition and Regulation) Act 1986, a child is a person who has not completed fourteenth year of age. The recent Amendment Act of 2016 also defines the term child in the same way. However, it says that the definition of child may be adopted from The Rights of Children to Free and Compulsory Education Act, 2009. Further, the Amendment Act of 2016 in Section 4 (i) has included the definition of adolescent. According to this definition, a person who is above the age of 14 but below 18 years, is adolescent for the purpose of this legislation. It is pertinent to mention here that the Juvenile Justice Act, 2015 defines a child as a person upto 18 years of age. As per the provisions of Section 79 of Juvenile Justice Act, whoever engages a child in employment, maybe liable for rigorous imprisonment for a term which may extend to five years and shall also be liable to fine of one lakh rupees. Moreover, Section 79 of this Act shall prevail upon the provisions of any other legislation. So, here an anomaly is created between JJ Act, 2015 and the provisions of Child Labour Prohibition and Regulation Act, 1986. Similarly, there are other legislations that define the term 'child' differently. For example, The Plantation of Labour Act, 1951 defines child as a person who has not completed 15th year of age.

The Act of 1986 aimed at creating a unified procedure to regulate the working conditions of children in various employments. It fixed the working hours at six, with the break of one hour after a shift of three hours (Section 7 of the Child Labour Prohibition and Regulation Act, 1986). Further, making a child work overtime is also prohibited under Section 7 of the Act. The timings have also been regularised as not between 7:00 PM and 8:00 AM. A child cannot be made to work or be required to work in another establishment on the days he has already

been working. Thus, this provision under Section 7 (6) removes all kinds of doubts regarding the working hours of the children.

The Act of 1986 and the new Amendment Act of 2016, however, permit a child to be employed in a family enterprise, the occupation being a non-hazardous one. This engagement is allowed to be after school hours or during the vacation.

The definition of ‘hazardous process’ is to be borrowed from the Factories Act, 1948 as:

“any process or activity in relation to an industry specified in the First Schedule where, unless special care is taken, raw materials used therein or the intermediate or finished products, bye-products, wastes or effluents thereof would—  
(i) cause material impairment to the health of the persons engaged in or connected therewith, or

(ii) result in the pollution of the general environment.”

### MAJOR CAUSES OF CHILD LABOUR

There are many factors that contribute to the problem of child labour. The main causes are discussed as under:

1. *Poverty*- Poverty is the most common factor that contributes to the compulsion for the children to be employed and skip their chances to get education. With poverty, comes child labour as households use every available means to survive. The studies reveal that 1 percent point rise in poverty leads to at least a 0.7 percent point increase in child labour (Edmonds, E. V, 2006; G. Porto and B. M. Hoekman, 2010; Edmonds, E. V., and N. Schady, 2012 as cited in ILO and UNICEF, 2020). According to another study (Cognieu, D., and R. Jedwab, 2012), “in Côte d'Ivoire on the drop in cocoa prices in the 1990 economic crisis found that a 10 percent fall in income led to a more than 3 percent decline in school enrolment and more than 5 percent increase in child labour”. According to The World Bank, (as cited in ILO and UNICEF, 2020) the number of people in extreme poverty could reach from 40 million to 60 million this year alone compared to before the COVID-19 crisis. The estimates point to a 20 percent rise in 2020. Extreme poverty is defined as those living on less than \$1.90 per day.

2. *Unemployment amongst Adults*- Since the adults of the family are unable to get proper employment, the children are forced to work. Further, children are often the most available labour in households. When households need more financial support, they turn to Children (Edmonds, E., and C. Theoharides, 2020). Parental unemployment due to economic shocks in Brazil has led children to step in to provide temporary support. Similar effects have been documented in many countries including India (Jacoby, H. G., and E. Skoufias, 1997).

3. *Lack of awareness amongst society*- This is another significant sociological factor that makes the vice like child labour to prevail. If the society is sensitive enough not to accept the children working in their tender years, at least some industries will start taking it seriously.

4. *Migration*- Migration is again related with economic compulsion. The migrated labourers have to make their children work in order to meet their daily necessities.

5. *Prevalence of social inequities*- Inequitable distribution of resources amongst different strata of the society contributes to poverty and hence child labour. The studies reveal that most of the children employed belong to Dalit communities (Gupta, R., 2016)

### IMPACT OF COVID-19 ON VICTIMISATION OF CHILD LABOUR

As discussed earlier, when the poverty increases, the child labour also increases. Further, the unemployment status ticks are also very grim. During covid-19 crisis “Global working hours fell in the first quarter of 2020 by an estimated 4.5 percent compared to the final quarter of 2019. This adds up to approximately 130 million full-time jobs, assuming a 48-hour work week. Global working hours in the second quarter are expected to be 10.5 percent lower, equivalent to 305 million full-time jobs” (ILO and UNICEF, 2020).

During lockdown due to the threat of the spread of COVID-19 virus, the children got involved in other activities(ILO and UNICEF, 2020). Since the schools were closed. In a study conducted in Malawi, one of the children said:

“Many parents in my neighbourhood have taken advantage of the ‘holiday’ to send children to town to sell fruits and vegetables”.

ILO and UNICEF, 2020 analysis reveals that “they supplement family income when adults are unable to work, especially since they can skip or bypass curfews as they are less visible and less likely to be caught by police”. So, there is likelihood of increase in child labour as one of the results of the ongoing pandemic.

### JUDICIAL INTERVENTIONS

The problem of exploitation of children has been increasing inspite of so many statutes. The courts have also tried to fulfill their constitutional commitments by adjudicating guidelines from time to time. These judicial interventions may be distributed in three stages: First, pre-M.C. Mehta case, second post M.C. Mehta case and thirdly, Post Amendment Act of 2016.

### PRE-M.C. MEHTA CASE

The landmark case of *People's Union for Democratic Rights v. Union of India* (AIR 1982 SC 1473) is one of the most significant cases in this behalf. In this case, the court held that children below the age of 14 years can't be

employed in hazardous work. As the children were employed in construction work in this case, the court held that it is a hazardous work and it is violative of their right under Article 24 to employ them in construction work.

In *Salil Hydro Project v. State of Jammu Kashmir* (AIR 1984 SC 177) also, the honourable Supreme Court reiterated the principle that construction work is hazardous in nature. So, the children can't be employed in that work.

In *Bandhua Mukti Morcha v. Union of India* (AIR 1984 SC 802), a PIL was filed on behalf of children employed in carpet industry of Varanasi and Mirzapur. It was alleged that it is violative of Article 24 to employ children below the age of 14 year in such industry. The court held that the children should be given an environment that helps them becoming a productive member of the society. So, the court directed that the provisions of compulsory education, regular health checkups and nutrition food must be created. The court also directed that periodical reports of the progress of these schemes to be submitted to the Supreme Court.

In *Sheela Barse v. Union of India* (1986) 3 SCC 423), the Honourable Chief Justice Bhagwati observed that:

"A Child is a national asset; it is the duty of the State to look after the child with a view to ensure full development of his personality. Emphasising the significance of the dignity of youth, and childhood in a civilized society".

In the case of *Vishal Jeet v. Union of India* (AIR 1990SC1412), the Supreme Court took serious note of the buying and selling of female children for prostitution and held that failure to protect children from such exploitation is the sheer violation of Article 23,24, 39 (e) and 39(f) of the Constitution.

#### **DISCUSSION IN M.C. MEHTA V. STATE OF TAMIL NADU AIR 1997 SC 699**

In this case, the employment of children below the age of 14 years in the crackers and match factories located in Sivakasi was brought to the notice of apex court. Considering the economic constraints of the families of these children, the court held that children may be employed in the packing work and not in the manufacturing process with the caution that the place of packing must be away from the place of manufacture in order to avoid exposure. As on December 31, 1985, there were more than 200 match factories in Sivakasi. 27,338 workers were employed in the factories, out of whom 2941 were children. A serious fire accident took place wherein many people died out of which some were children. The Supreme Court took up the case suo moto and laid down several guidelines for the safety of child workers. The court directed the states to conduct survey within six months of the decision and remove the children from all hazardous employments. The state was also directed to give an. Alternate employment to

the children near their residence. The Court identified nine such industries wherein the children were prohibited to be employed.

#### **POST M. C. MEHTA CASE SCENARIO**

After this judgment, as per the direction of the court, a collaborative survey was conducted by the government. It was found that in the national Capital itself there are 1740 child labour during 1996 and 1330 erring industries have been subjected to penalty to the tune of one crore rupees (The Quami Awaz (Urdu) July 3, 1997, p.3.) In Rajasthan, total number of child labour identified in 31 district was 8158 out of which 316 were employed in hazardous and 4994 in nonhazardous industry. In Jaipur alone there are 364 children which is hard to believe (The Times of India, July 8, 1997, p.8). In Orissa, 21500 child labour have been reported, the highest in India. Maharashtra and Madhya Pradesh have reported 15,000 and 14,000 respectively (The Hindu, July 8, 1997, p.3). According to the Supreme Court, U.P. has 6.15 lacs child workers whereas the State Government findings put the figure at 32,000 and 15,000 are working in hazardous industries (The Pioneer, July 8, 1997, p.3). In Bihar altogether 27 survey were conducted and only 287 child workers were working in the States (The Hindustan Times, June 1997, p.5). In Karnataka, the official survey estimated 96,520 child labourer whereas NGO's put the figure at 35 lakhs (The Indian Express, August 4, 1997, p.3). In Tripura, 24,000 child labour were working in different industries (The Hindu, July 6, 1997, p.10).

The influx of child labour in the infamous factories of Sivakasi continues to be as heavy as before, inspite of the Supreme Court's judgment in December, 1996 passing strictures against the use of child labour in hazardous industries. Recently, Smitu Kothari (2013) conducted a survey regarding the position of child labour. In February 2012, there was again a fire accident in one of the match factories near Sivakasi, killing six children. According to this study, as many as 45 thousand children were employed in these factories out of total one Lakh workers. The study revealed that these children get up between 3:00 to 5:00 AM to reach the factory as far as 30 kilometers away. According to the estimates, 44% of the children are below the age of 15. Despite the directive of the apex court in Jammu and Kashmir carpet industry, nearly 7 thousand children between age of 8 to 10 are employed who work for a monthly wage of ₹ 80 for the work of eight hours a day. Nearly 60% of these children suffer from asthma and tuberculosis.

#### **CURRENT SCENARIO (POST AMENDMENT ACT OF 2016)**

While the Act of 1986 tried to bring conceptual uniformity regarding the definition of child, the Amendment Act of 2016 has again created an anomaly as it is in conflict with many other legislations as regards the definition of child.

Further, as the Amendment Act of 2016 permits the child to work in family business, many experts consider this provision as jeopardizing to the interests of the children. According to ILO and UNICEF (2020), working in family business generally gives no consideration to the safety and the health concerns of the children. According to this study, when the children worked in informal family enterprises, they faced increased exposure to work related hazards.

Section 3 (2) (b) of the Amendment Act 2016, further permits a child to work as an artist other than in a circus. The conditions laid down for that permission are that the safety measures are taken care of. Secondly, the education of the child should not be affected prejudicially due to that kind of employment. The term 'artist' has been defined as an activity involving or relating to entertainment or sports.

The Amendment Act prohibits an adolescent to be employed in any hazardous employment. The penalty for employing a child or adolescent in contravention of Section 3 or section 3A shall be imprisonment of not less than six months which may go upto two years or fine may also be imposed, which shall not be less than twenty thousand rupees and may extend up to fifty thousand rupees. The provision to section 18 (1) and 18 (1A), however, exempts the parents or guardians from liability unless they permit the child to work in contravention of the provisions of the Act. If any person commits the offence again, the minimum punishment shall be one year, and it may extend to three years. The Amendment Act also provides for creation of Child and Adolescent Labour Rehabilitation Fund under section 14-B of the Act. The offences if are committed by parents or guardian for the first time, such offences shall be treated as compounding offence under Criminal Procedure Code. The amendment has decreased the number of hazardous employments in the list. Resultantly, the adolescents may be employed in many harmful activities like chemical mixing units, cotton farms, battery cycling and brick kilning" (Gupta R., 2016).

The rules supplementing this amendment have, however, clarified the scope of employment in family business and also as an artist since the working hours are limited and the provisions of RTE Act have also been taken care of.

## CONCLUSION

Yet again, on 12th February 2021, a fire accident occurred taking 15 lives in one of the firework factories near Sivakasi (The Hindu, 13th February 2021). And it is very unfortunate to know that the children are still working in such factories. To conclude, it may be said that the employment of child labour has been increasing inspite of all the legislative and judicial interventions. Although the commencement of the RTE Act, 2009 has resulted in more enrollment of children in schools, but the efforts don't seem to be sufficient. Hence, there is a need of stronger political and social commitment to deal with this problem.

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## A STUDY ON SERVICE QUALITY OF SELECTED HEALTH INSURANCE INDUSTRY IN PUNJAB AND UNION TERRITORY OF CHANDIGARH

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### ABSTRACT

*In these days, most of the population of our country is suffering from one or more disease due to bad eating habits, busy life style or any other reasons. Every person needs medical care sometimes or at old age. Due to increasing health problems and increasing medical cost it becomes very complicated for a common man having limited financial resources to survive. Thus, it can be said that health insurance is become essential to reduce the burden of out of pocket expenditure on health and to remove the financial burden. The success of any corporation depends upon the availability of products and quality of service provided to its customers. Due to increasing competition in the market every insurer wants to please its customers by providing best quality of the products. It is very difficult for the customers to evaluate the service quality of services as compare to goods due to lack its physical attributes. Service quality in health insurance depends upon the capacity of the companies to fulfil the expectation of the customers. So, it becomes necessary for the health insurance companies to provide better services to its customers. This paper is an attempt to study the service quality of selected health insurance companies in Punjab and Union Territory of Chandigarh.*

**Keywords:** Health Insurance, Service quality, Perception, Servperf.

### INTRODUCTION

Health insurance can be broadly defined as a financial mechanism that exists to provide protection to individuals and households from expenses incurred as a result of unexpected illness or injury(Bhat and Reuben, 2002). Health insurance is an insurance which reduces the risk of medical expenditure in near future by paying a specified amount of money as a premium according to the terms and conditions of the policy. Like other types of insurance in health insurance, insurer usually provides either direct payment to hospital or reimbursed the expenses associated with illness and injuries and disburses a fixed amount.

Service quality is well-defined by Ducker (1991) as “what the customer gets out and is willing to pay for” rather than “what the supplier puts in. Hence service quality is repetitively conceptualized as stated by the difference between the expectations and perceptions perceived service actual performance (Bloemer et al., 1999); Quality in the context of service businesses has been conceptualized in a different way and on this basis alternate scales have been suggested for service quality measurement. SERVQUAL and SERVPERF found two main service quality measurement scales. SERVPERF is suggested best for measuring the only perception of the service quality (Brown et al., 1993). Cronin and Taylor (1992) recommended that expectation section of SERVQUAL scale be rejected and only performance section be used. Therefore, in this study we used SERVPERF scale which comprises of 22 statements of perception section of

SERVQUAL model as developed by Parasuraman, Zeithaml and Berry (1988).

### REVIEW OF LITERATURE:

Borah (2012) analyzed the satisfaction level of 50 customers of Kotak Mahindra Life Insurance branch located at Jorhat and service factors affecting customers' satisfaction. The results showed that majority of the respondents were satisfied from the services of this company. It was concluded that factors like tangibility, accessibility and understanding had the maximum impact on customer satisfaction. It was suggested that company should try to execute its pledge timely, solve customers' grievances honestly and provide prompt services to the customers.

Amponsah and Hiemenz (2009) investigated the overall service quality of health care providers in Ghana. The data was collected from 531 women aged 15-49. It was found out that 63.4 percent of the patients were satisfied. Users of the private health service providers were more satisfied with the service of providers than consumer of public health providers. It was also revealed that factors like distance, waiting time, maternal education and gender of child had significant association with health care satisfaction.

### RESEARCH METHODOLOGY:

The present study is based on primary data. The sample size of the study was 12 general insurance companies providing health insurance including eight private sector companies named Bajaj Allianz, Royal

Sundram, Icici Lombard, IffcoTokio, Tata Aig, Reliance general insurance companies and four public sector companies namely National, Oriental, New India and United India. The data was collected through questionnaires from 435 customers having health insurance policy of general insurance companies of Punjab and Union Territory of Chandigarh. Descriptive statistics has been used to analyse the data.

#### **DATA ANALYSIS AND INTERPRETATION:**

To measure perception of the customers towards the dimensions of service quality (i.e. tangibles, reliability, responsiveness, assurance and empathy) the respondents were asked to indicate their opinion on a five-point likert scale (ranging from strongly agree that has been assigned weight of 5 to strongly disagree which has been allocated weights equal to 1) and their constructs score have been obtained. Thus, higher score indicates positive attitude of customers towards the particular dimension of service quality or vice versa.

#### **TANGIBLES**

Tangibles consist of appearance of physical facilities, equipment and appearance of personnel etc. (*Parasuraman et. al., 1988*). Table 1 shows that a vast majority of the policyholders were agreed with the statements, viz. 'Present health insurance company has up to date equipment and technology (i.e. computers etc.)' (89.7 per cent); 'Present health insurance company's physical facilities are visually appealing' (87.9 per cent); 'Present health insurance company's employees are well dressed and appear neat' (84.9 per cent); 'The appearance of the physical facilities of present health insurance company is in keeping with the type of services provided' (75.4 per cent).

Further, table 1 depicts that the customers' attitude towards the tangibles is highly positive compared to the other dimensions as it obtained the highest score of 4.03 (SD = 0.86).

**TABLE: 1**

#### **MEAN SCORES REPRESENTING OPINION OF POLICYHOLDERS AND CONSTRUCT SCORE REGARDING TANGIBLE DIMENSION OF SERVICE QUALITY**

(N=435)

Items' Labels	Statements	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree	Weighted Average Scores
<b>TAN 1</b>	Present health insurance company has up to date equipment and technology (i.e. computers etc.).	206 (47.4)	184 (42.3)	7 (1.6)	36 (8.3)	2 (.5)	<b>4.23</b>
<b>TAN 2</b>	Present health insurance company's physical facilities are visually appealing.	139 (32.0)	243 (55.9)	10 (2.3)	34 (7.8)	9 (2.1)	<b>4.08</b>
<b>TAN 3</b>	Present health insurance company's employees are well dressed and appear neat.	133 (30.6)	236 (54.3)	24 (5.5)	35 (8.0)	7 (1.6)	<b>4.04</b>
<b>TAN 4</b>	The appearance of the physical facilities of present health insurance company is in keeping with the type of services provided.	114 (26.2)	214 (49.2)	29 (6.7)	64 (14.7)	14 (3.2)	<b>3.80</b>
<b>Overall Tangibility's Construct Score (SD=0.86)</b>							<b>4.03</b>

#### **RELIABILITY**

The reliability is the ability of the company to perform the promised service dependably and accurately (*Parasuraman et. al., 1988*). Below table 2 clearly reflects that most of the policyholders agreed with all the statements of reliability dimension of service quality, i.e. 'When present health insurance company promise to do something by a certain

time, it does so' (80.4 per cent); 'When you have problems, present health insurance company is sympathetic and reassuring' (75.9 per cent); 'Present health insurance company is dependable' (69 per cent); 'Present health insurance company provides its services at the time it promises to do so' (80.5 per cent); 'Present health insurance company keeps its records accurately (error free bills and documents)' (81.7 per cent).

**TABLE: 2**  
**MEAN SCORES REPRESENTING OPINION OF POLICYHOLDERS AND CONSTRUCT SCORE**  
**REGARDING RELIABILITY DIMENSION OF SERVICE QUALITY**  
**(N=435)**

Items' Labels	Statements	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree	Weighted Average Scores
<b>REL 1</b>	When present health insurance company promise to do something by a certain time, it does so.	115 (26.4)	235 (54.0)	14 (3.2)	61 (14.0)	10 (2.3)	<b>3.88</b>
<b>REL 2</b>	When you have problems, present health insurance company is sympathetic and reassuring.	114 (26.2)	216 (49.7)	32 (7.4)	60 (13.8)	13 (3.0)	<b>3.82</b>
<b>REL 3</b>	Present health insurance company is dependable.	97 (22.3)	203 (46.7)	46 (10.6)	70 (16.1)	19 (4.4)	<b>3.66</b>
<b>REL 4</b>	Present health insurance company provides its services at the time it promises to do so.	114 (26.2)	236 (54.3)	14 (3.2)	55 (12.6)	16 (3.7)	<b>3.87</b>
<b>REL 5</b>	Present health insurance company keeps its records accurately (error free bills and documents).	109 (25.1)	246 (56.6)	28 (6.4)	38 (8.7)	14 (3.2)	<b>3.91</b>
<b>Overall Reliability's Construct Score (SD=0.93)</b>							<b>3.83</b>

The overall reliability score calculates to be an average of 3.83 (SD = 0.93) as depicted in the table 2. Thus, result indicates that the overall customers' have modest level of positive feeling about the reliability of the services of the health insurance companies.

#### RESPONSIVENESS

Responsiveness dimension emphasizes on the willingness to help the customers and provide prompt services (*Parasuraman et. al., 1988*). Table 3 portrays that a maximum proportion of policyholders have shown their

agreement with all the statements of responsiveness dimension of service quality as provided by their health insurance companies, viz. 'Present health insurance company does not tell customers exactly when services will be performed' (69.9 per cent); 'You do not receive prompt service from employees of present health insurance company' (73.6 per cent); 'Employees of present health insurance company are not always willing to help customers' (73.8 per cent);; 'Employees of present health insurance company are too busy to respond to customers' requests promptly' (74% per cent).

**TABLE: 3**  
**MEAN SCORES REPRESENTING OPINION OF POLICYHOLDERS AND CONSTRUCT SCORE**  
**REGARDING RESPONSIVENESS DIMENSION OF SERVICE QUALITY**  
**(N=435)**

Items' Labels	Statements	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree	Weighted Average Scores
<b>RESP 1</b>	Present health insurance company does not tell customers exactly when services will be performed.	82 (18.9)	222 (51.0)	26 (6.0)	88 (20.2)	17 (3.9)	<b>3.61</b>
<b>RESP 2</b>	You do not receive prompt service from employees of present health insurance company.	104 (23.9)	216 (49.7)	25 (5.7)	66 (15.2)	24 (5.5)	<b>3.71</b>
<b>RESP 3</b>	Employees of present health insurance company are not always willing to help customers.	104 (23.9)	217 (49.9)	22 (5.1)	70 (16.1)	22 (5.1)	<b>3.71</b>
<b>RESP 4</b>	Employees of present health insurance company are too busy to respond to customers' requests promptly.	127 (29.2)	195 (44.8)	25 (5.7)	69 (15.9)	19 (4.4)	<b>3.79</b>
<b>Overall Responsiveness's Construct Score (SD=1.08)</b>							<b>3.70</b>

The average responsiveness score of 3.70 (SD=1.08) as reflected in table 3 suggested that the health insurance companies have been able to show moderate level willingness to help the customers.

#### ASSURANCE

Assurance dimension associated with the knowledge and courtesy of employees; and also, on their ability to inspire trust and confidence among their customers regarding the services of service provider (*Parasuraman et. al., 1988*).

Table 4 depicts that the maximum percentage of respondents agreed with the following statements, that are, 'You can trust the employees of present health insurance company' (76.1 per cent); 'You feel safe in your transaction with the present health insurance company's employees' (81.4 per cent); 'Employees of the present health insurance company are polite' (85.5 per cent);

'Employees get adequate support from the present health insurance company to do their jobs well' (81.6 per cent).

Table 4 reflects that the assurance dimension in the underlying study has average score of 3.81 ( $SD = 0.86$ ); indicating that the customers were impressed to the moderate extent with the knowledge and courtesy of employees of health insurance companies.

**TABLE: 4**  
**MEAN SCORES REPRESENTING OPINION OF POLICYHOLDERS AND CONSTRUCT SCORE REGARDING ASSURANCE DIMENSION OF SERVICE QUALITY**  
**(N=435)**

Items' Labels	Statements	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree	Weighted Average Scores
ASS 1	You can trust the employees of present health insurance company.	70 (16.1)	261 (60.0)	19 (4.4)	63 (14.5)	22 (5.1)	<b>3.68</b>
ASS 2	You feel safe in your transaction with the present health insurance company's employees.	80 (18.4)	274 (63.0)	16 (3.7)	52 (12.0)	13 (3.0)	<b>3.82</b>
ASS 3	Employees of the present health insurance company are polite.	75 (17.2)	297 (68.3)	12 (2.8)	42 (9.7)	9 (2.1)	<b>3.89</b>
ASS 4	Employees get adequate support from the present health insurance company to do their jobs well.	84 (19.3)	271 (62.3)	19 (4.4)	47 (10.8)	14 (3.2)	<b>3.84</b>
<b>Overall Assurance's Construct Score (SD=0.86)</b>							<b>3.81</b>

### EMPATHY

Empathy dimension reflects the caring, individualized attention which is given by a firm to its customers, while delivering service (*Parasuraman et. al., 1988*). Table 5 illustrates that a substantial percentage of respondents have agreed towards the statements, viz. 'Present health insurance company does not give individual attention to you' (66.2 per cent); 'Employees of present health insurance company do not give personal attention to you' (70.6 per cent); 'Employees of present health insurance

company do not know about your needs' (72.4 per cent); 'Present health insurance company does not have your best interests at heart' (68.7 per cent); 'Present health insurance company does not have operating hours convenient to all their customers' (73.4 per cent).

Below table also reflects that the average empathy score was 3.67 ( $SD = 1.09$ ) which signified that the health insurance companies have been able to assure just moderate level of empathy in delivering of services to their customers.

**TABLE: 5**  
**MEAN SCORES REPRESENTING OPINION OF POLICYHOLDERS AND CONSTRUCT SCORE REGARDING EMPATHY DIMENSION OF SERVICE QUALITY**  
**(N=435)**

Items' Labels	Statements	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree	Weighted Average Scores
EMP 1	Present health insurance company does not give individual attention to you.	86 (19.8)	202 (46.4)	40 (9.2)	81 (18.6)	26 (6.0)	<b>3.55</b>
EMP 2	Employees of present health insurance company do not give personal attention to you.	114 (26.2)	193 (44.4)	31 (7.1)	68 (15.6)	29 (6.7)	<b>3.68</b>
EMP 3	Employees of present health insurance company do not know about your needs.	118 (27.1)	197 (45.3)	30 (6.9)	66 (15.2)	24 (5.5)	<b>3.73</b>
EMP 4	Present health insurance company does not have your best interests at heart.	115 (26.4)	184 (42.3)	30 (6.9)	81 (18.6)	25 (5.7)	<b>3.65</b>
EMP 5	Present health insurance company does not have operating hours convenient to all their customers.	99 (22.8)	220 (50.6)	26 (6.0)	71 (16.3)	19 (4.4)	<b>3.71</b>
<b>Overall Empathy's Construct Score (SD=1.09)</b>							<b>3.67</b>

Overall, it may be concluded that the customers have moderate to high level of positive attitude towards the different dimensions of service quality which has been provided by the surveyed health insurance companies while delivering their services.

### CONCLUSION

It can be concluded on the basis of the findings of the study the customers had very positive feeling toward the tangible dimension of service quality and moderate feeling toward the reliability dimension of service quality. Also, the customers had moderate level of attitude towards the responsiveness, assurance and empathy dimension of the service quality. Overall, it may be concluded that the customers had modest to high level of positive attitude towards the service quality of the health insurance companies.

### SUGGESTIONS

It is suggested on the findings of the study that health insurance companies should increase the services towards reliability, responsiveness, assurance and empathy dimension which depicted services at moderate level. Health insurance companies should increase their efforts on these dimensions. So that customers can get services at their level of expectations from their services providers.

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## EMPLOYEE DEVELOPMENT AND QUALITY OF LIFE: TLF APPROACH

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### ABSTRACT

*A better quality of life is important for increasing the satisfaction level of employees. If the employee will be satisfied, then he/she will work efficiently to accomplish the ultimate objectives and goals of an organization and for career growth. This paper aims to improve the employee's professional and personal quality of life by procuring them suitable training and development modules to provide them job satisfaction. Taguchi method is a statistical process used for the improvement of the quality of the product by reducing the cost. Taguchi explained that a drop in quality occurs when the customer is not satisfied by using the product which he purchased at a given price within a period. The study concludes that for making employee's quality of life their development and enhancement of their skills, knowledge, and exposure, etc is significant. Taguchi loss function helps to manage the quality of employee's life by providing the development program. This study contributes to identifying the controlled and non-controlled factors of employee development for improving the professional and personal life of employees.*

**Keywords:** *Quality of Life, Job satisfaction, Taguchi method, Training and development, Controlled and non-controlled factors, Employees.*

### INTRODUCTION

Employee Development is important for Human Resource Management. Employee Development refers to enhance knowledge and skills. (Hameed, 2011) Employees should attend training programs or development activities to learn new ideas, skills, or concepts. Employee Development is used to enhance the abilities and efficiency of the individual or employee which helps the organization to achieve its target or goals. It is essential to enhance the skills, knowledge, etc of employees, from time to time to meet with the technology updates and to learn new skills and techniques which help in the development or progress of the organization.

Quality of life means the things that we need for a classic quality of life. It is the standard evaluation of health, and positive and negative effects, comfort, and happiness experienced by an individual or group of people. (Srivastava et al., 2014) The Quality of life model is based on the categories individuality(existence of entity), acceptance(sense of security in friendship), and befitting(appropriate for achieving goals) The conception of "quality of life" is to fulfil the basic needs of individual or group of people like well-being, happiness, morale, life satisfaction, job satisfaction.

Quality of life does not immediately diminish and individual and social costs do not ascend immediately when

the commodity is not following conditions that are explained in Taguchi's loss function. (Brown et al., 2004)

### LITERATURE REVIEW

#### Motivation:-

In the Organization, there are developed employees who know many things and they perform their best in the organization. Their personal and professional lives are developed in an appropriate style. Their every requirement, need, etc; everything is fulfilled. But when we see it from the point of view of underdeveloped employees and observe based on societal and managerial implications that it needs to do some efforts for them. So, that their knowledge, skills, exposure, the experience can also develop, they also able to perform the tasks efficiently in an organization. Their lifestyle can also develop, their quality of life can also be different, their wants or deficit can also fulfill. For the improvement and development of those employees and their quality of life, I get motivated to suggest or recommend something which will be helpful for those underdeveloped employees and help them in developing and improving their life.

Lofthouse (1999) study "The Taguchi Loss Function" in which he explained that Taguchi has evolved two steps-

- Upgrading the plan of the commodity or procedure by manufacturing the commodity in the finest way utmost of the extent with lower variation from the objectives
- The uncontrollable factors influence ensuring that the products produced are identical (in products variation is minimum) for designing the insensitive product or process. (Lofthouse, 1999)

Park (1996) in his book “robust design and Analysis for Quality engineering”, explained that in the robust design there are two crucial tools are used. These are:-

- Quality with emphasis on deviation measured by signal to noise ratio
- Many design factors are accommodated by orthogonal arrays (Park, 1996)

Phadke (1989) in “Quality engineering using Robust Design”, stated the noise factor are classified into three origins that are represented by the deviations-

- One to one deviation: It is produced by the deviation in substance, apparatus execution, and craftsmanship
- Environment factor: The noise occurred because of environmental condition neighboring the processes
- Devaluation factor: It's include depreciation of the machines or items and usable or edible products used in the process (Phadke, 1989)

Juran(1999), Juran is the father of quality of life. The Juran trilogy provides steps to top-level management for the improvement of projects. The Juran Trilogy models are Quality planning(Quality and plan), Quality control(Controlling process and managerial), Quality improvement(Lean Six Sigma). (*Quality Handbook.Pdf*, n.d.)

Philips Crosby(1979) ‘Quality is free’ sets a program to implement easily by using genuine case histories to establish that how to control and manage the quality and provide a certain instrument for success. (*Quality - Crosby.Pdf*, n.d.)

Pugalendhi (2011) “Quality of Work Life: Perception of college teachers”, this study disclosed the significance of total work-life quality concerning the quality of life in the total teaching environment. They stated that the QWL concept is essential for a favorable situation in a working environment and also established that according to its working level, the quality of college teachers is low. (Bharathi, 2011)

Ursula Hoyningen-Suess, (2012) study about “Tools for surveying and improving the quality of life: people with special needs in focus”. The study focuses on surveys and the betterment of incapacitated Quality of life of people’s by defining online tools. By using diagnostic tools quality of disabled people’s life evaluated and analyzed and define the factors that affect their life quality and recommend enhancement by using planning tools. (Ursula Hoyningen-Suess, 2012)

Jessica Li Roland, (2016), the topic of study is “Quality of work-life and career development: perceptions of part-time MBA students”, in this paper review, what employee observe as a negative and positive condition of their (action) work and how their decision of career and concept of quality work-life (QWL) affects.(Li et al., 2011)

M. Ben-daya,(2016), "The integration Taguchi's loss function approach in the economic design of  $x^-$ -chart", in this paper the economics design of the control chart defines out-control and in-control costs by incorporated the Taguchi's method. (Authors, 2003)

Haozhe Chen, (2019) “Returns management employee development: antecedents and outcomes”, In this research investigation of the employee development antecedents and impact with in the area of relations management that are challenging. (Chen et al., 2019)

Khawaja jehanzeb(2020) is studied in employee development: "Does perceived organizational support and employee development influence organizational citizenship behavior?", It examines the relation between OCB (organizational citizenship behavior) employee development, and POS (perceived organizational support) while allowing for the deliberating result of P-O (person-organization) on the union. (Jehanzeb, 2020)

## RESEARCH GAP

The employee development gap increases because the employee only focuses on his professional and career development opportunities in the organization and managers' efforts for the development of employees. Managers don't have knowledge or information about what their employees or team members want. If the managers don't know what their employee wants or how to improve the employee's quality of life, his effort will be not helpful or maybe misguided and lack of resources is also increase the employee development gap. So, to improve employee development, managers should provide more opportunities and resources for professional growth. A manager must have also the knowledge of what his employees or team members are interested in or find important for professional development.

## OBJECTIVES

- Identify the controlled and non-controlled factors of the employee's development.
- Improving the employee's quality of life by the origin of Taguchi Loss Function

## METHODOLOGY

Identification of problem-

The manager thinks that he is providing the right training and activities program for the employee but on the other hand employee thinks that he is not getting the proper training and priority that he needs and not satisfy with the facilities he gets. So, the problem is how to satisfy the employee or how to know that employee is satisfied or not

with the treatment he gets in the organization. To solve this problem managers should use Taguchi loss function, which will help to improve or eliminate the error or defect that occur between manager and employee in an organization.

### CONTROLLABLE FACTORS OF EMPLOYEE DEVELOPMENT-

1. **Career development opportunities**-Employee development provides a special training program and different courses which help employees to learn about the new skills and technology and help in gathering extra knowledge which develops different opportunity for employees.
2. **Adopt a learning culture**- The Business environment is dynamic in nature. It keeps changing according to time, time to time new technologies are innovated and to make update the employees about the technology the adaptation of learning culture is necessary.
3. **Better motivation**- In any organization, motivation is a very important factor that helps the employees for achieving the ultimate organizational goals and objectives. If the employee is motivated, then he can perform the given task efficiently and effectively.
4. **Job satisfaction**- If the employee is not satisfied with the job, he will be not able to work according to his capability. To perform the task efficiently, the employee should be satisfied with his job and some authority and basic requirement of the employee should be provided to him. Salary and incentives are provided according to their work performed.
5. **Completed training and courses**- Main aim of employee development are to develop the employee by providing those special training programs and courses which enhance their knowledge and skills about the change in technology and changes that occur in the business environment.

### NON-CONTROLLABLE FACTORS OF EMPLOYEE DEVELOPMENT-

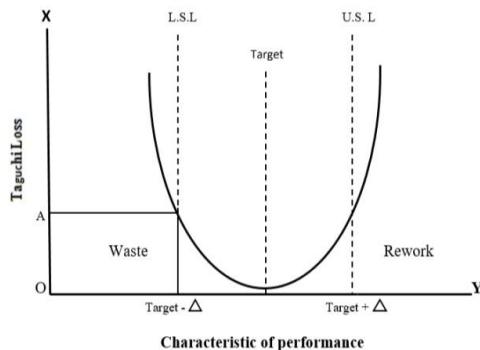
1. **Manager working relationship**- In any organization, the healthy relation of employees with other employees or managers is essential because a healthy relationship can improve productivity, it can boost your career, and help in achieving success.
2. **Biased authority**-In any organization, the authority should not be biased. Every person has provided authority according to their position and they all have given equal chances to speak and give suggestion to achieve the goals or overcome from the problems occur in organizations.
3. **Employee health**-Employee health and well being is an essential factor of any successful organization. If employees are healthy, they can perform the assigned job efficiently. The health of an employee determines the overall productivity of the organization.
4. **Time is taken to complete the goals**- To achieve any goals and objectives, some periods are required. To complete the task swiftly, employees have to manage the time and work in an organized way.
5. **Technological changes**- The changes that come in the business environment are important for organizations because changes provide flexibility in working. Modernized technology makes the work of employees easy and efficient.

### TAGUCHI LOSS FUNCTION

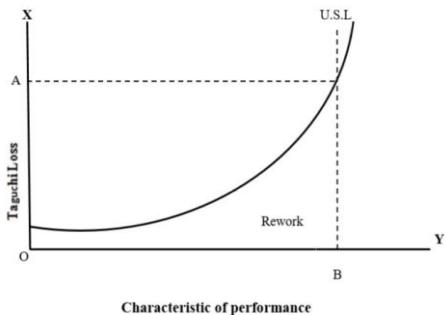
Japanese quality expert Genichi Taguchi developed the Taguchi loss function. Taguchi's method is aimed at quality improvement. Taguchi loss method is a methodology to enhance the quality of the product by reducing the cost. Taguchi believed that variations in production could improve quality or help in quality control. He deliberated a three-point methodology to address the issues. These are: System design, Parameter design, Tolerance design (Lofthouse, 1999)

It can be characterized as:

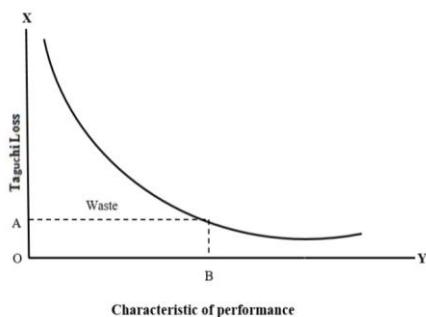
#### 1. Two-sided equivalent detail Taguchi work



## 2. Side minimum-limit function



## 3. One-sided maximum-specification limit function



$$F(x) = D(t-n)^2 \quad (1)$$

Here,

**F(x)** = LOSS FUNC () from the goal worth,

**t** = TARGET regard,

**n**=NOMINALvalue of the specific,

**D**= deviation coefficient

### STEPS FOR THE TAGUCHI METHOD

The main steps for the valuation of performance through the T.L.F:

1. The identification of main functions
2. Identification of the noise and control factors of the performance evaluation
3. Selecting the control factors and their level
4. Conduction of the experiment
5. Analysis of the data

**For the evaluation of the performance the control and noise factors are as follows:**

#### 1. Control factors:

- 1 Absenteeism
- 2 Customer review
- 3 Contribution cost
- 4 Knowledge about the job

5 Professional skills

6 Job satisfaction

7 Job fit

8 Technical training

9 Appearance

10 Response at workplace

#### 2. Noise factors:

- 1 Duration of completion of work
- 2 Biased authority
- 3 Faulty equipment
- 4 Relation with the co-worker
- 5 Work arena

The objective function for this will be:

**Smaller-the-better.**

- There will be 3 control factors with 3 levels:

These factors were selected after the various consideration and brainstorming session which was conducted with the help of the team and their guidelines.

**Table I. Levels of C.F**

C.F.	Levels		
	I	II	III
Absenteeism(monthly)	5	6	7
Knowledge about Job (below %)	70	60	50
Completion time(day)	25	27	29

**Orthogonal array selection:**

We have taken the (OA) L9 array in this Taguchi loss function method for studying the performance and quality function of the employees.

**Table II.Organic array**

Experiments	Control factors		
	1	2	3
1	1	1	1
2	1	2	2
3	1	3	3
4	2	3	1
5	2	1	2
6	2	2	3
7	3	2	1
8	3	3	2
9	3	1	3

**Table III.The measured value of Completion Time**

Experimentno.	(DAYS)								
	Period involved	incomplete	task	1	2	3	4	5	Mean
1	25	27	29	26	28				27
2	26	25	30	24	23				25.6
3	27	26	28	23	22				25.2
4	29	21	23	27	29				25.8
5	28	25	25	23	26				25.4
6	24	27	23	22	20				23.2
7	30	23	26	20	22				24.2
8	29	27	21	25	30				26.4
9	28	28	29	24	25				26.8

**EXPERIMENTATION DETAILS AND ASSESSMENT OF DATA:**

The data of the experiment is collected and then analyzed for the calculation of the sign-to-noise rate (proportion).

**Table IV. S/N ratio**

Experiment no.	Ratio
1	-28.6
2	-28.16
3	-28.02
4	-28.23
5	-28.09
6	-27.30
7	-27.67
8	-28.43
9	-28.56

## RESULTS

In the Taguchi loss function, Taguchi represents graphically that a person is satisfied as long as variation in the products stays within a standard limit. The quality of the employee's professional and personal life develops only when he is satisfied with the change in variation of standard limit that he gets in the job opportunities and training activities. If he/she does not get training modules and opportunities according to their desire they will get dissatisfied.

## LIMITATIONS AND FUTURE SCOPE

In the Taguchi loss function, standard limits do not separate the level of satisfaction of the employees. The Taguchi function shows the increase or decreases limits in the form of lower and upper but not in terms of numbers and any variation from target values leads to the dissatisfaction of employees or workers. The dissatisfaction of employees and workers leads to loss of cost and quality both. The variation directly affects the quality and satisfaction of the employee and the cost of an organization.

## CONCLUSION

The study reveals that better quality of life of employee helps to achieve the ultimate goals of an organization and help in the growth of an organization. An unsatisfied employee is a loss for the organization and if the employee is satisfied with the job and training modules then they will be beneficial for the organization and by providing them training and development modules, helps them to use their corresponding skills, etc to achieve ultimate goals.

The evaluation of employee's Performance is also helping in the improvement of the quality furthest reaches of specialists and lowers the hazard of disappointment comparatively as aides in allotting the correct development to the perfect individual. The study of the research paper is focused on identifying the controlled and non-controlled factors of employee development and improving the Quality of the professional and personal life of employees by selecting and analysing the controlled factors by using the Taguchi loss function.

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## ASSESSMENT OF MD&A READABILITY USING FLESCH READABILITY FORMULA: A STUDY OF INDIAN COMPANIES

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### ABSTRACT

In this study, the easiness of reading the Management Analysis and Discussion (MD&A) reports of seven companies listed in Bombay Stock Exchange has been checked. This study has applied the Flesch readability formula for checking the readability of the MD&A reports of these seven companies and the Flesch read score is not found to be so satisfactorily from the chosen sample. So, it is suggested that there is need to improve the content, language and the vocabulary by the companies in Indian context with regard to MD&A disclosures and further, the length of sentences and words should be kept shorter for providing effective understanding of the text of MD&A report. And use of passive voice in sentences should also be reduced to ensure the right meaning of what management wants to convey to their stakeholders.

**Key Words:** MD&A, Readability, Flesch Readability Formula, Listed companies

### INTRODUCTION

Stakeholders of a company generally want to know about the company's performance, risk associated, future plans, the employees and what unique skills a company is possessing to increase its market value. Annual reports are considered as the main tool for the company to communicate with its stakeholders (Courtis J. K., 1987). In today's scenario, almost every big company is showing all such information through their annual reports. These reports are thus quite useful for the stakeholders of the company and these reports are prepared by companies at the end year, which can be either calendar year or fiscal year (Islam, 2018). Nowadays, listed companies are also presenting their management discussion and analysis (MD&A) report in their annual reports in India as per LODR (Listing Obligation and Disclosure Requirement) 2016. MD&A report shows both financial and non-financial information of the companies at one place in the annual report. It provides an overall image of the organization's disclosures directly from the eyes of the management. Overall, almost every listed company provides MD&A reports in their annual reports in India. But the ease of reading the contents of this MD&A report is a big concern in fact a challenge. It means whether the report is easy to read or not. Considering both kind of information i.e. qualitative and quantitative, annual reports are intended to be beneficial for the readers for taking their decisions (IASB, 2010).

### CONCEPT OF READABILITY

The word readability is showing how simple and easy to read a text is. The main components of the readability are shorter words, shorter sentences, fewer syllables, less

number of passive voice sentences and words are easier to read.“Readability tries to match the ability of reader and text and then tries to get the ease to read of a text for the reader. Readability is that quality in writing which results in quick and easy communication”(Chall & E, 1948). It shows readability of text is the most important element for communication. It has been observed that there is an increase in stock trading and stock trading volume after presentation of MD&A in the annual reports. Therefore, it clears that the readability level of MD&A disclosures occupies important concern as far as their usefulness is concerned.

### LITERATURE REVIEW

No doubt, several researchers have worked on the measurement on the readability of MD&A given in annual reports. Nicholas & Gibson, 1990 had done an experiment on the readability of MD&A reports with ease and made an effort to quantify the readability computation for the interpretation in the MD&A and also the president's letter and they result that many firms did not present their MD&A reports in a simple and easy understanding manner and missed the opportunity to improve the financial report communications.. Li, 2006 had examined the readability and the writing style of annual reports of the companies by using the large firms sample from 1993 to 2003 for predicting future firm earnings & returns and the study resulted that firms with poor performance publish hard reading reports while profitable firms with more complicated reports have a low level of consistency in earnings, but these measures are not correlated with future stock returns.

Yusuf & Jordon, 2017 found that the accessibility of MD&A by the state government financial reports. Accessibility was checked on the basis of three parameters size, timeliness and readability. They have studied the financial reports of 50 state governments from the period 2009-2012. They concluded that only a few state governments in the USA were presenting their MD&A which are easily accessible by the readers. There was lack of adequacy of MD&A in giving information to the citizens about government financial conditions. Also, the existing financial reporting of governments neither crystal clear nor user-friendly for the citizens.

Ernfjord & Gustafsson, 2014 studied the readability and amount of revelation of sustainable reporting in Sweden in financial crisis 2008 and they have used the 'Flesch reading ease formula' for reading the easiness in reading the report. They have concluded that readability, measured by the Flesch reading ease formula did not change during the financial crisis of 2008, and the amount of revelation increased. Moreno & Casasola, 2015 analyzed readability of two Spanish companies and they have used the Flesch reading ease formula for that. Nut Flesch ease formula considered the English language mainly. Their study has shown the results that reports were hard to read but there is an enhancement in the readability over the years. Richards, Fisher , & Staden studied the significant impression management strategies, thematic manipulation and reading ease manipulation among different corporate reports. Their study concluded that disclosures with a constructive tone are more readable than destructive tone. And CSR (corporate social responsibility) is more readable part of annual reports than MD&A, Chairman's reports and CSR.

Islam, 2018 measured the readability of corporate governance by applying different tools of readability measurement such as Flesch Reading Ease Formula, Fog index, Dal-Challe, Fry graph etc. and concluded that readability of corporate annual report were not same for different companies and a relationship did exist between the performance of company and readability of annual reports.. Mohmad & Rahman, 2006 analyzed the two sections of MD&A reports i.e. notes to the accounts and chairman' letter and taken 100 Malaysian companies listed on the stock exchange and studied the readability of both these sections by using a Flesch Reading Ease Score. Thus he found that chairman' report had been presented in a more

readable writing style and use of less passive voice sentences than notes to the accounts.

## OBJECTIVE AND METHODOLOGY

This study aims to check the readability ease of selected companies listed in Bombay Stock Exchange (BSE) and to explore the relationship among the dimensions of readability with regard to MD&A reports of these companies.

This study has examined the MD&A reports of the top seven companies listed in BSE. These companies were selected on the basis of their market capitalization as on 18th July, 2020 and they all have the MD&A reports in their annual reports for a wider target audience. Also, these companies were having large market capitalization and thus it is considered that they are representing different industries as well. Big companies are generally expected to provide more detailed reporting than smaller one(Courtis & Hassan, 2002). Thus, MD&A reports of these top listed companies for the year 2019-2020 are considered.

## TOOL FOR MEASURING READABILITY

### FLESCH READING EASE

The most widely used tool for measuring the readability is the Flesch readability formula developed by Flesch in 1948. This formula produces a score and this formula used word length per sentences and number of syllables per word as under:

$$RE = 208.85 - (1.015 * ASL) - (84.0 * ASW)$$

ASL: Average word length per Sentences

ASW: Average number of syllabus per word

RE: Readability Ease

This study has considered five bases to check the overall readability of the reports. Those indicators are *word length*, *sentence length*, *Flesch readability score*, *Flesch reading ease index* and *use of passive voice*.

The text is considered in a good readable format when it has short sentences, short words and less use of passive voice sentences. Thus, Flesch readability score is a formula which gives a score on 1 to 100 point scale. Higher score means more ease in readability like short words, sentences and less use of passive voices. The readability score is classified as various levels of reading ease as in Table 1.

Table 1- Flesch score and reading ease level

Ease of readability	Readability score
Very easy to read, easily understood by an average 11-year-old student	90-100
Easy to read	80-90
Fairly easy to read	70-80
Easily understood by 13- to 15-year-old students	60-70
Fairly difficult to read	50-60
Difficult to read, best understood by college graduates	30-50
Very difficult to read, best understood by university graduates	0-30

Source:[https://en.wikipedia.org/wiki/Flesch%20%93Kincaid\\_readability\\_tests](https://en.wikipedia.org/wiki/Flesch%20%93Kincaid_readability_tests)

### **CALCULATION OF READABILITY STATISTICS**

This study is generally considering top companies of the BSE 30 index on the basis of market capitalization. It has been observed that big corporations published their annual reports for a large targeted audience (Courtis & Hassan, 2002). The researchers obtained the annual reports of these companies from their respective official websites and then extracted the MD&A reports from them. After getting the PDF version of the MD&A reports, PDF files were converted into MS word files by using a website "I love PDF to word". MS word is opted as a tool to get the Flesch readability score (Attamimi & Ameer, 2010)(S., 2006). The grammar option of MS word software is used to check the readability of each MD&A report. And a detailed statistics of readability like length of sentences, word length, length

of sentences, percentage of words per sentences, length of sentences per paragraphs, Flesch readability score etc. are determined.

After getting all relevant factors which influence the readability of the MD&A reports like word length, sentence length, Flesch reading ease index and use of passive voice (Mohmad & Rahman, 2006). The collected data was organized into the SPSS file and further descriptive were analyzed like the mean, standard deviation, minimum maximum etc. and then correlation among words, sentences, passive voice sentences, Flesch reading score and Flesch reading grade was studied. The whole analysis is presented here in the tabulated format as in table 2, table 3, and table 4.

### **ANALYSIS AND RESULTS**

**Table 2- Readability score**

	Maximum	Minimum	Average
Flesch Readability Score	29.40	14.50	23.36

*Source: Compiled from the annual reports (2019-2020) of these companies*

This table is showing the Flesch reading ease score of the top seven listed companies. From the above table, it is found that the highest reading ease score has been achieved is 29.4%, while 14.5 the lowest among these seven companies. But it is also evident that most of the companies are scoring between 20-30 Flesch index scores. Thus, from table 1, it can be inferred that the average reading score of all the selected companies are lying in between 0-30 that is

23.36, which is the lowest level provided by the Fischer index model. Thus, in overall, it can be concluded that there is a very hard level in reading of MD&A reports presented by these companies and can be read by experts and specialized people. Thus, regulators must have to check in for regularizing such practices as far as enhancing the usefulness of MD&A reports is concerned.

**Table 3-Descriptive statistics of the factors of Readability of MD&A Reports**

	Words	Sentences	Passive Sentences	Flesch Reading Ease	Flesch Kincaid Index
Minimum	17324.00	710.00	10.00	14.50	14.10
Maximum	71939.00	2437.00	20.00	29.40	16.90
Mean	29897.00	1096.00	15.14	23.35	15.10
Std. Deviation	19162.62	613.55	3.28	5.07	1.05

*Source: Compiled from the annual reports (2019-2020) of these companies*

Descriptive analysis of the readability dimensions of a text like word length, jumper of sentences, number of passive voice, Flesch reading ease score and Flesch Kincaid index is mentioned in table 3. Thus, the table presents that the minimum word length used in a MD&A report was 17324 and the maximum were 71939, almost 4 times more than the minimum one while the standard deviation is not so far. The minimum number of sentences in the MD&A report were 710 while the maximum were 2437. But the variation is very high in the sentences, use of more passive sentences

is not considered good in Flesch reading ease score. So, here the minimum passive voice used in the MD&A report was only 10 while the maximum was 20. So, it is good here to see that on an average only 15 passive voice sentences were used in all the MD&A reports of those seven companies. And the variance is also low. Minimum score of Flesch reading ease was 14.5 and maximum 29.4. And on an average, it has been 23.357, which is still low and not considered under a good reading level as far as MD&A reports are concerned

**Table 4: Relationship among different aspects of MD&A Report**

		Length of words	Length of sentences	Number of passive voice sentences	Flesch Kincaid grade level	Flesch reading ease
Pearson coefficient	<b>Words</b>	1.00	.82	.35	.19	-.60
	<b>Sentences</b>		1.00	.393	.05	-.21
	<b>Passive Sentences</b>			1.00	.83	-.46
	<b>Flesch Kincaid Grade Level</b>				1.00	-.66
	<b>Flesch Reading Ease</b>					1.000

*Source: Compiled from the annual reports (2019-2020) of these companies*

In this table, words &sentences and passive statements & Flesch Kincaid grade level are found to be highly positively correlated with each other. But, all other factors like length of words, length of sentences, and use of passive statements and Flesch Kincaid grade level are negatively correlated with the Reading ease. If we see the length of words, length of the sentences and number of passive sentences, then it is observed that word length is highly negatively correlated with the Flesch reading ease score than the length of sentences and number of passive sentences. Although, these two (length of sentences and passive sentences) are also correlated but not that much as the length of words are. So from here, it can be concluded that, the more the word length in MD&A reports, the lesser the reading score and vice versa. In the same way, companies must have to use less length of sentences and less number of passive voice sentences in the reports to make it easier to read.

## CONCLUSION

The readability of MD&A disclosures of the Indian companies has been examined. As per this study based on the MD&A of top seven listed companies of India, the overall findings are showing that the readability score is not satisfactory. The overall score was below 30, as shown in table1, which is considered to be tough for a common person to analyze and interpret it. Secondly, it is found that more the length of words in a sentence and more number of sentences in a paragraph are negatively correlated with reading ease score. It means, to make ease in readability of MD&A reports, it is needed to be short length of sentences and words. Further, it is found that, more number of passive sentences in reports, makes the report less meaningful and hence, it becomes difficult to read and understand what the report is indicating. So, it is also suggested that use of passive voice should be minimum in an MD&A report for successful accomplishment of objectives of MD&A disclosures.

Moreover, the same aspect should be examined further by taking more companies and time periods for MD&A reports to know the readability of all the results of this study. A comparison of Indian companies and foreign companies can also be undertaken and other formulas or tests available for knowing the readability level of reports

can be used to test the applicability of the Flesch Reading Formula.

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## AN EMPIRICAL STUDY OF PRODUCT EVALUATION BY INDIAN CONSUMERS WITH REFERENCE TO INDIAN PRODUCTS VIS-À-VIS FOREIGN PRODUCTS

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### ABSTRACT

*With wide portfolio of choice to the consumers, competitive requirements of businesses have increased worldwide. The scenario has become rather tougher for the developing nations like India where the businesses have to constantly compete with the products from the developed countries. However, given the amount of population and size of domestic market, Indian companies have got huge opportunity to sell their products in India. This requires a favourable shift in the image of Indian products that most of Indian consumers carry in their minds. This paper attempts to analyse the factors that determine the product evaluation and consequent purchase decisions of Indian consumers and also to study the perception of Indian consumers towards Indian products vis-à-vis global products with a view to bring out measures that can help to increase purchase intention for Indian products.*

### INTRODUCTION

Under the impact of globalization, nations are getting integrated and so are the national markets. Consumers are at huge advantage with wide portfolio of choice and varying price range giving them opportunity to buy the best as per their need, preference and affordability. This fast-changing scenario has thrown mountain challenge to the businesses worldwide to become more competitive in comparison to their rival brands. The competition becomes rather tougher for the developing countries as the products from these nations are preferred generally less in comparison to foreign brands from developed industrialized nations. Therefore, every nation now aspires to develop to a level where its name becomes a brand in itself and encourages people from all over the world to buy its products.

National branding helps to cut down the cost of advertising and promotion and therefore helps the nations to focus more on product attributes and prices. Therefore, branding and marketing is not an area of concern for businesses alone but an equal concern for the nations too. There is ample literature available on how the image of country of origin affects the perception of consumers and their purchase intention of foreign goods. Most of the relevant literature suggests that consumers perceive brands of developed nations to be of better quality than those coming from the developing nations. This often becomes a major cause of concern for businesses in developing nations as they are hit hard on two sides. Their products are not trusted by foreigners in most of the nations and local/indigenous customers also prefer to buy foreign products/brands rather than the indigenous brands.

India, being a developing nation, faces a similar kind of situation. As per IMF's October World Economic Outlook

2020, India is the fifth largest economy in terms of nominal GDP and it is the second largest market in terms of size of population. With growing incomes and huge amount of population, India is becoming an attractive market for the businesses worldwide. An equally important and interesting fact is that Indian businesses have an ample opportunity to sell their products within the country that the developed nations do not have because of their saturated markets and economies.

In the present volatile world where international economic upheavals have become a routine, it is extremely important for India to keep its fundamentals intact and strong with greater focus on its own businesses, own people and own market. Vocal for Local Campaign being run by the present NDA government is all about encouraging local brands, local manufacturing and supply chain. Along with encouraging foreign brands having their manufacturing and assembly units in India, vocal for local campaign is about making Indian brands competitive vis-à-vis foreign brands so that Indians start taking pride in their own brands rather than preferring global brands.

For the success of vocal for local campaign, it is highly important to analyse the factors that make Indians prefer foreign brands over local brands. To grow in terms of manufacturing and to promote greater incomes and employment, it's essential for a developing nation such as India local brands and products are preferred over global brands whether imported or produced within. This would be, undoubtedly, an ideal market scenario for Indian businesses.

Literature suggests that consumers' perception about different brands and products is largely determined by the image of country of origin and image of country of origin is

determined by level of economic and technological progress, political standing, its culture and tradition. Country of origin effect on consumers' quality and value perception may be product specific or generalized. For instance, consumers may have positive quality perception of swiss watches but it may not be true for all other swiss products. When consumers' quality perception, whether positive or negative, is confined to a particular product or products, it happens because of comparative strength or weakness in those few sectors but when perception of consumers is more generalized, national branding comes into play.

Review of literature suggests that most of the studies on country-of-origin effect on consumers' behaviour are conducted outside India and therefore could not capture the peculiar behaviour of Indian consumers. Very few studies have been conducted on Indian consumers but they also failed to capture country of origin effect on consumers' perception from view point of India's distinct demography. Besides, almost all the studies have been conducted with the orientation of finding the factors that can help developed countries to understand how they can distribute and sell their products conveniently and successfully in developing nations by using country of origin effect as their primary promotion strategy. There is hardly any study carried out to understand and analyse the factors that determine perception of Indian consumers regarding Indian brands vis a vis global brands and how Indian companies can enhance competitiveness of their brands vis a vis global brands and improve consumers' perception about them.

## RESEARCH OBJECTIVES

As evident from the above discussion, country of origin effect created through made in label has the potential to completely change consumers' perception about the product and therefore should be a major point of consideration while drawing the marketing strategy. There are several factors responsible for general liking or disliking for products/brands made in different countries and researchers have already studied and analysed these factors in detail in previous studies. However very few studies have been carried out to find the perception of Indian consumers as regards their own Indian brands/products vis a vis foreign brands and what role demographic characteristics of population play as far as formation of consumers' perception is concerned. The present study runs with following objectives in mind:

1. To analyse the factors that determine the product evaluation and purchase decisions of Indian consumers.
2. To study the perception of Indian consumers regarding Indian products vis-à-vis global products.
3. To bring out measures that can help to increase purchase intention for Indian products.
4. To make recommendations

## REVIEW OF LITERATURE

A lot of research has been carried out at the international level to study the effect of made in label on the product evaluations by consumers and their purchase intention. Schooler (1965) found that consumers in Central American market evaluated products with similar attributes very differently because of difference in made in label.

Nagashima (1970) maintained that countries are stereotyped based on their image which finally gives rise to country-of-origin effect among consumers and this stereotyped image of nations is based on their industrial development, production and marketing strengths, technical and scientific progress, political and economic background, emphasis on innovativeness and creativity, traditions, culture and history. Bikley and Nes (1982) recorded strong association between made in label and quality perception and product evaluation by consumers.

Han and Tepestra (1988) concluded that consumers perceive the image of country of origin on the basis of five dimensions: technical progress, prestige, level of economic advancement, workmanship and serviceability. Hong and Wyer (1990) found that people in developing nations perceive products from advanced countries to be qualitatively better than their own local products. Jo (2005) concluded that consumers consider country of origin as a major indicator of quality to form their perception about the product.

Scott and Keith (2005) experimented whether country stereotypes can be activated spontaneously in people's mind by mere spread of information about country of origin and how far it affects product quality judgements of consumers without their intention or control. The study found that effect of country of origin gets activated automatically and it also affects consumers' product evaluations.

Peng and Zou (2007) consumers judge the quality of products based on their attributes and if all the attributes of domestic product are comparable with the foreign product then consumers evaluate domestic product more favourably than the foreign product. Lee and Lee (2009) found in their study that effect of country of origin and product knowledge are inversely related. Higher the product knowledge, lower is the country-of-origin effect.

## SCOPE AND DESIGN OF STUDY

The study has been carried out in the cities of Mohali, Chandigarh and Panchkula together known as Tricity. The study is based on primary data collected through a carefully designed questionnaire. Convenience Sampling method has been used for the purpose. Due consideration has been given to the various demographic aspects such as age, gender, occupation, level of education and income profile of the people while deciding the sample group. Though questionnaires were sent to 180 respondents but six questionnaires had to be rejected because of incomplete information taking the actual size of sample to

174.Demographic and income profile of the respondents is given in table 1.

**Table 1: Demographic and Income Profile of the Respondents**

	Categories	Frequency	Percentage
Gender	Female	85	48.85
	Male	89	51.15
	Total	174	100
Age	18 – 21	23	13.22
	21 – 35	54	31.03
	36 – 50	61	35.06
	Above 50	36	20.69
	Total	174	100
Educational Qualification	10+2	09	5.17
	Graduation	89	51.15
	Post-Graduation	65	37.36
	Doctorate	07	4.02
	Others	04	2.30
	Total	174	100
Type of Employment	Salaried	62	35.63
	Business	56	32.18
	Professional	31	17.82
	Student	22	12.64
	Others	03	1.73
	Total	174	100
Annual Household Income (Rs)	Less than 200000	24	13.79
	200000-500000	53	30.46
	500000-1000000	61	35.06
	Above 1000000	36	20.69
	Total	174	100

## FINDINGS AND DISCUSSION

### A. Factors that Determine Purchase Decision of Indian Consumers

One of the primary objectives of the study is to find out the important factors that determine purchase intention of the consumers in India. Consumers were asked to respond

to several questions on a five-point Likert scale ranging from 1 for Not Significant to 5 for Highly Significant. Thereafter mean responses of consumers were recorded for all the statements and t test was conducted to assess the relative significance of different factors in determining the consumers purchase decision.

**Table 2: Factors Determining the Purchase Decision**

Factor	Mean	±SD	t value	p value
Price	3.9435	0.9304	7.8792*	<.0001
Quality	4.2507	0.8718	9.0618*	<.0001
Design and Appearance	3.0108	0.9203	2.6083	0.0871
Features	3.8273	0.9662	7.4613*	<.0001
Brand Name	3.6518	1.0132	5.8571*	<.0001
Made in Label	3.5266	0.9662	3.8216*	<.0001
Post-Sale Service	3.3741	0.7713	3.6279*	<.0001
Advertisement	3.3491	0.9379	3.6088*	<.0001
Advice of Social Groups	3.6304	0.7421	4.7810*	<.0001

\*significant at 5% level

Table 2 shows that consumers in India give highest importance to quality while making their purchase decision followed by price, features, brand name, advice of social groups. Made in label has also been found a significant factor that determines the purchase decision of consumers

but it is found less important as compared to brand name. Design and appearance are not found to be significant factors behind the purchase decision of consumers.

### A. Preference between Indian and Foreign product with comparable quality and price

As the study suggests that quality followed by price are the primary determinants of consumers' purchase decision in

India therefore an attempt was also made to know the purchase preference of consumers between Indian and foreign product if both are available at comparable quality and price. Respondents were given choice to respond to any of the three choices and the results are reported in table 3.

**Table 3: Preference between Indian and Foreign product with comparable quality and price**

Statement	Number of Respondents	Percentage of Respondents
Will buy imported product made in developed country	124	71.27
Can't say	07	4.02
Will buy Made in India Product	43	24.71
Total	174	100

As given in table 3, only 24.71% respondents showed their willingness to buy made in India product rather than foreign product, however, 71.27% respondents showed preference for imported foreign product despite the comparable quality and price. This becomes evident that rather than price and quality, there are other factors which hold back Indian consumers from buying Indian products.

#### B. Consumers' Perception and Opinion towards Made in India Products:

In order to study the perception and opinion of Indian consumers regarding made in India products, a set of statements was given to all the respondents and they were asked to respond on a five-point Likert scale with responses ranging from 1 for Strongly Disagree to 5 for Strongly Agree. The mean responses for all the statements along with their t values are reported in table 4.

**Table 4: Perception and Opinion towards Made in India Products**

Statement	Mean	±SD	t value	p value
Made in India Products are good in quality	4.6967	0.3187	9.8103	<.0001*
Made in India Products are available at comparable prices	4.3159	0.4026	7.4648	<.0001*
Made in India products are well designed	2.1832	1.8032	1.2173	0.0421
Made in India products are more durable than foreign products	3.2978	0.4907	1.0991	<.0001*
Made in India products are contemporary and stylish	2.0851	0.8194	4.9582	0.3059
After sale service of Indian Products is comparable to foreign products	2.8961	0.8526	2.7823	<.0001*
Made in India Products are well marketed	1.5387	1.0109	1.2032	0.0436
Made in India Products are well distributed	1.9043	0.9387	1.0651	0.0114

\*significant at 5% level

Most of the respondents in all categories strongly agreed to the statement that Made in India products are of good quality and available at comparable prices. Mean response of the respondents is also found to be statistically significant in this regard. However, most of the consumers either strongly disagreed or disagreed with the statement that Indian products are well designed, contemporary, well marketed and distributed. Consumers also seemed somewhat satisfied with after sale service of Indian products that showed statistically significant t value.

#### C. Consumers' Opinion about likelihood of increasing purchase preference for Indian products

Based on results in table 4, respondents were asked to respond to three statements on five-point Likert scale ranging from 1 for Extremely unlikely to 5 for Extremely likely. Mean responses were then recorded and tested for significance. Results regarding mean responses of the respondents along with their t values are reported in table 5.

**Table 5: Consumers' Opinion about likelihood of increasing purchase preference for Indian products**

Statement	Mean	±SD	t value	p value
Contemporary designing of Indian products will elevate purchase intention of Indian consumers	3.8361	0.9582	4.1877	<.0001*
Improved distribution of Indian products will improve their sale in India	4.3701	0.8703	7.0372	<.0001*
Sound marketing of Indian products will motivate Indian buyers to buy them rather than imported foreign products	4.9365	0.8491	9.1863	<.0001*

\*significant at 5% level

As evident from the above table, sound marketing along with improved distribution and contemporary designing can help Indian companies to elevate the consumers' purchase intention for Indian products. Indian companies need to be

relatively more competitive in terms of their marketing, distribution and designing skills so as to give tougher competition to their foreign counterparts.

comparable. Most of the respondents strongly agreed that made in India are good in quality, price competitive, durable and having comparable after sale service. However, consumers didn't seem satisfied with designing, marketing and distribution of Indian products and suggested that Indian companies can increase purchase preference for Indian products among Indian consumers by improving

marketing, distribution and designing of Indian products. Therefore, Indian companies need to be relatively more competitive in terms of their marketing, distribution and designing skills so as to give tougher competition to their foreign counterparts in the minds of Indian consumers as well as Indian market.

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## A REVIEW ON DEVELOPMENT OF SMART CHATBOT USING NATURAL LANGUAGE PROCESSING

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### ABSTRACT

*Chatbots have become increasingly popular in recent years, and many have been programmed to replace existing chatbots. A chatbot is a program that allows you to communicate with a computer. An application that collaborates with users and caters to their needs. The chatbot responds to the user's questions and can even make recommendations, perform activities on a regular basis. Early chatbots were too difficult to create, but newer chatbots are much easier to build thanks to development frameworks and source code. It may also used to build a chatbot can profoundly understanding (NLP). In comparison to traditional methods. In order to be efficient, chatbots and Deep Learning bots need a large amount of data well-informed. The purpose of this document is to demonstrate how different types and classifications of chatbots can be developed. The performance of bots is also explored in this paper. This aids in the development of better bots.*

**Keywords:** Chatbots, Natural Language Processing (NLP), Deep Learning.

### I. INTRODUCTION

People have become more popular in recent days. Chatbots grew as people interacted with digital devices. Users can converse with machines using chatbots. Chatbots are computer programmes that can converse with each other.

The original chatbots were created solely for amusement. To learn the entry sequence, the Deep Learning bot requires Neural Networks, which can be built in a variety of ways. Some boats, such as ELIZA<sup>[1]</sup>, ALICE<sup>[2]</sup>, only use input text, whereas Amazon Alexa supports voice as input bots like Siri, Google Assistant

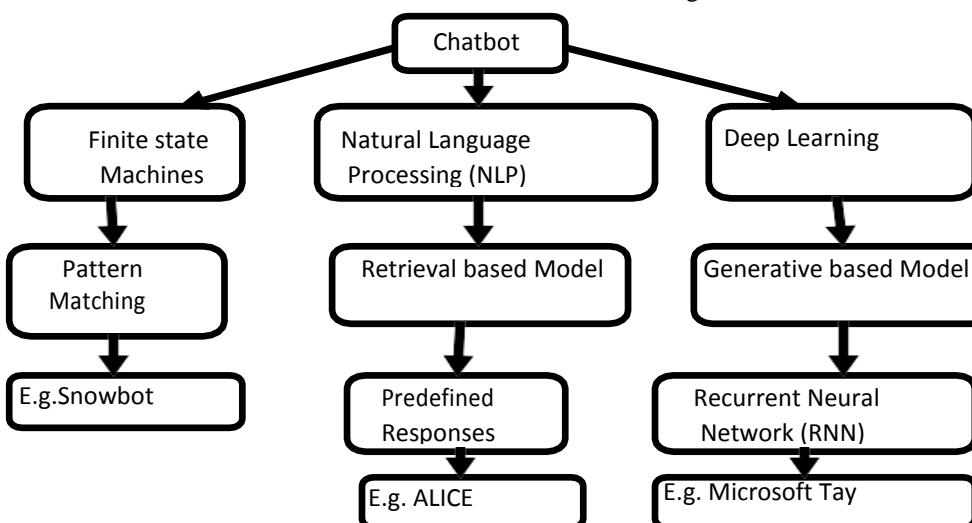


Fig.1: Flow chart of Chatbot

- A. **Natural Language Processing (NLP):** It's a division of artificial intelligence that enables computers and humans to communicate<sup>[3]</sup>. Text

translation isn't the only use for NLP; it can also be used for speech recognition. SHRDLU, which is based on a limited vocabulary, and ELIZA,

which simulates communication by pattern matching and operates on a replacement methodology, are two common NLP systems developed in the early 1960s.

- B. Recurrent Neural Network (RNN):** This expands the general forwarding network<sup>[4]</sup>, allowing it to handle more traffic, and it not only measures current input but also produces a result of previous results. RNNs also have a memory that can be used to recover the input sequence. It has two layers: one for input and one for output. It has a layer and secret layers, just like every other neural network<sup>[5]</sup>
- C. Long Short-Term Memory (LSTM):** The greatest disadvantage of RNN is that they can't retain feedback for long periods of time. By extending the RNN and retaining long data sections, LSTM<sup>[6]</sup> can solve this problem.

## II. CLASSIFICATION OF CHATBOTS

In terms of the nature and details they're supposed to provide, there are two forms of chatbots<sup>[7]</sup>. The following are the details.

- A. Conversational Based chatbots:** A chat bot can be a chit-chat bot or a job-based chat and it is programmed to be fun or to accomplish a task. Chit-Chat bots have no clear goals; instead, they focus on general communication, while task-oriented chatbots

are programmed to perform specific tasks, such as placing an order or scheduling an event. A chat bot can be a chit-chat bot or a job-based chat, and it is programmed to be fun or to accomplish a task.

- B. Domain Based Chatbots:** There are two types of domain-specific chatbots: Bots with open domains and bots with closed domains. Horizontal chatbots, also known as open domain bots, are designed to answer any query. These bots are adaptable and pleasant to be around. Apple's Siri, Microsoft's Cortana, Amazon's Alexa, and Google Assistant are all part of this community. Closed-domain chatbots, also known as vertical chatbots, are designed to serve a specific function, such as providing directions to a specific location.

## III. ARCHITECTURAL MODELS OF CHATBOTS

A chatbot can take one of two forms: Machine learning models can produce a user response from scratch or from a predefined response repository<sup>[8]</sup>. In theory, a chatbot may be either generative or retrieval in nature.

- 1. Generative based models:** These models can generate human-like conversations. To achieve a respectable dialogue standard, such bots need millions of examples to be educated. Microsoft Tay<sup>[9]</sup> is a member of this party.

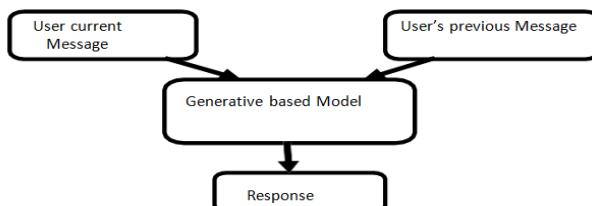


Fig.2: Generative based model

- 2. Retrieval based models:** These models are very easy to build and perform well. APIs are available for the

development of recovery-based models. They are easy to construct compared to generative models

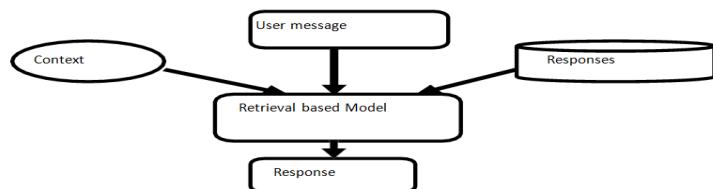


Fig.3: Retrieval based model

#### IV . EVOLUTION OF CHATBOTS

Various chatbots for entertainment and mission completion have been developed so far. Some of the most well-known chatbots are listed below.

1. **ELIZA:** Eliza is a groundbreaking chat bot created by MIT in 1966. It works by analysing trends and contrasting them. In order to follow the pattern for a correct answer, it needs user input and script searches.

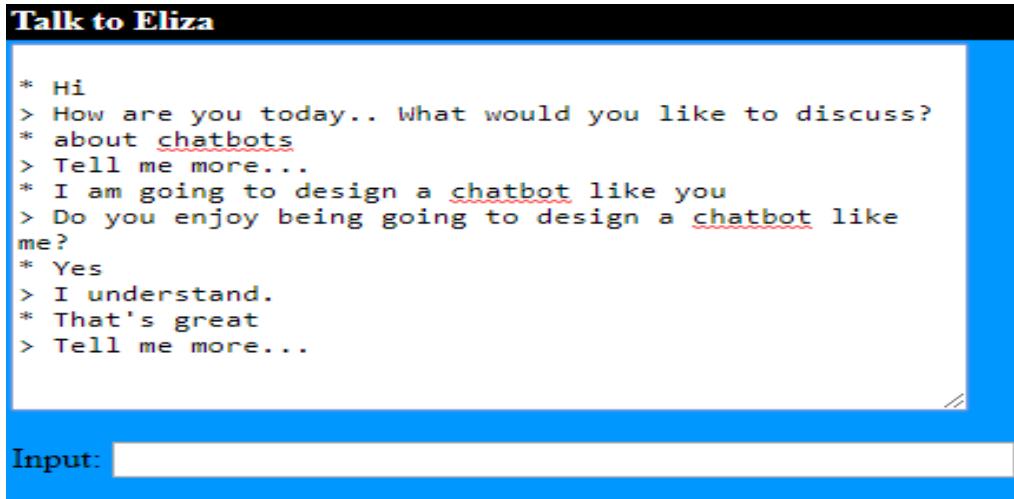


Fig.4: Eliza chatbot.

2. **ALICE:** It was founded in 2009. Users can make their own chatbots. It makes use of an artificial intelligence

character (AIML) vocabulary<sup>[10]</sup> with detailed language characteristics (XML).

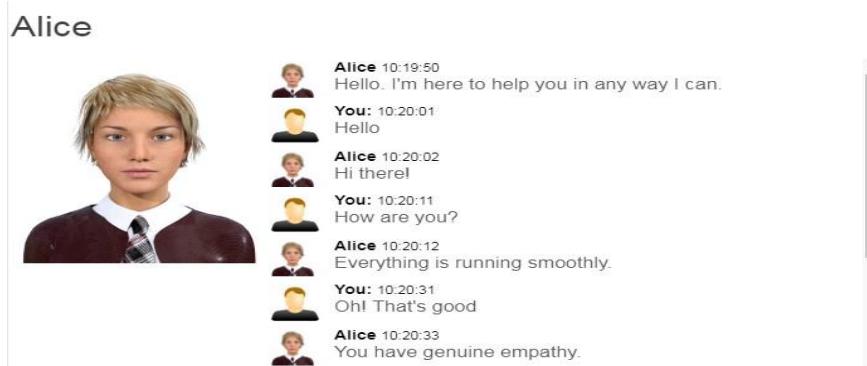


Fig.5: Alice chatbot

3. **Jabberwocky:** It's a chatbot for entertainment<sup>[11]</sup>. It mimics human conversation and does nothing else.

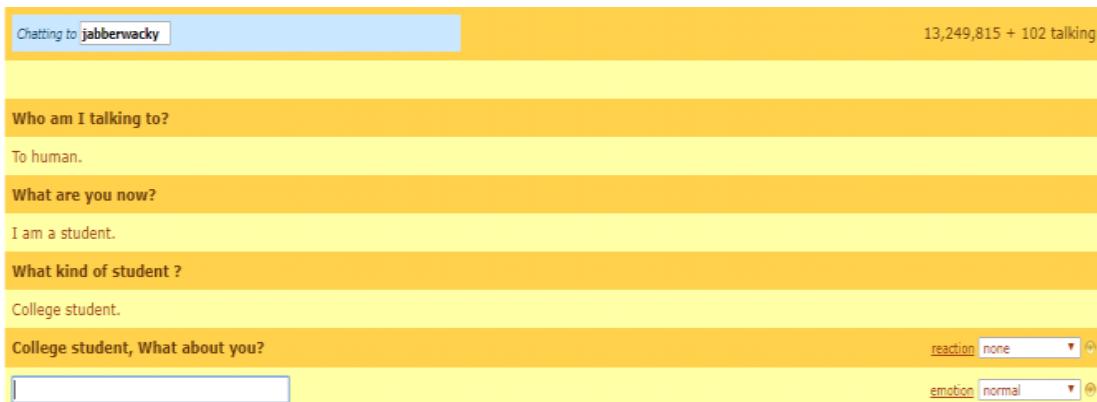


Fig.6: Jabberwocky chatbot

## V .OTHER POPULAR CHATBOTS

The above chatbots have become commonly recognized. Colby released Parry in 1975. It's the first bot to pass Turing. It is based on rules. In 2014, Julien Chaumont and Clement Delangue developed a new chatbot, Neural convo[12]. There are also several goal-oriented chat bots such as Medhat[13] facilitates and transparent medical diagnosis for both patients and physicians.

## VI. METRICS USED FOR EVALUATING CHATBOTS

A metric for assessing a market operation is a quantification measure [13]. A calculation that measures the chatbot about the performance. Some methods help design an efficient chatbot.

- **Bleu Score:** The BLEU score<sup>[14]</sup> is a method for comparing created text sequences to reference sequences. A method that is used is the BLEU score. Kishore Papineni proposed the BLEU score in 2002. It was developed solely for the purpose of translation a mission The BLEU score has a number of benefits:

METRICS	ELIZA	PARRY	JABBER WACKY	ALICE
Scalability	Not scalable	Not scalable	Not scalable	Not scalable
Turing test	Not passed	Passed	Passed	Passed
Interoperability	Low	Low	High	High
Speed	Low	Low	Average	High

Table.1: Evaluation metrics of different chatbots.

## VII. DATASETS

In the architecture of chatbots, data plays a vital role. Question/Answer pairs of queries should be teach to the chatbots. For the implementing of chatbots it contains number of datasets available. There were two datatypes for the chatbots: rdany-chat<sup>[16]</sup> and chatterbot-corpus-master<sup>[17]</sup>.

## VIII. CONCLUSION

This article show us to implement various methods of architectural chatbots. In addition to this, some different chatbots are included in a above table. The survey shows that the architecture of chatbots will carry the internet for a upcoming years. Implementing a newly chatbots will leads to the resolving the client's queries.

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## FEATURE BLENDING FOR AUGMENTED CLASSIFICATION ACCURACY WITH RESTRICTED TRAINING IMAGE DATA

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### ABSTRACT

*Enhanced familiarity with effortlessly available image capturing devices has resulted a paradigm shift in behavior of the mass. Content base image identification has gradually reduced the popularity of text keywords as generic means of searching from archived databases. In this work, we have statistically examined the affinity of users towards accuracy and timeliness of searching with content-based image data. The outcome of the experiment has encouraged exploring techniques to enhance accuracy of classification in absence of enough training data. In recent times, popularity of pre-trained convolutional neural network (CNNs) has presented considerable improvements in content-based image classification. But deep neural networks require huge amount of training data for feature generalization which is not available all the time and are also resource intensive. To address such scenario, the paper has examined and proposed two different feature extraction techniques which include a handcrafted technique and a pre-trained CNN based feature extraction. A small dataset is purposefully considered so that training data can be restricted. Further the features are fused to investigate probable improvements in feature generalization resulting in enhanced classification accuracies with limited training data.*

**KEYWORDS:** *Binarization, Content Based Image Classification, Feature Extraction, Feature Fusion, Convolution Neural Network*

### 1. INTRODUCTION

Conventional popularity of text-based communication is gradually and steadily replaced by content-based image data due to easy availability and expressiveness [1][2]. Abundance of image data has provided richer context to analyse hidden patterns in diversified scenarios [3]. One of the reasons behind popularity of image data content is to detect the optimized means for offering prompt services to real time queries [4]. Familiarity of smart phones and high-resolution image capturing devices has generated an incessant source of images[5][6]. This has empowered the users to search the images of their choice based on image content instead text keywords [7]. In recent times, world has witnessed the effect of pandemic where X-Ray images and Computed Tomography (CT) images has played a vital role by designing computer aided diagnosis systems for timely identification of the disease [8][9]. However, the rate of identification is not satisfactory even with deep learning techniques [10]. The reason behind is lack of training data. Thus, for any unforeseen scenario, content-based image classification may fall short of expectations due to unavailability of enough training data which results in enhanced misclassification. The objective of this work is to propose a system which can identify image categories

with enhanced precision even with lesser amount of training data.

This work has statistically examined user satisfaction for enhanced classification accuracy using content-based image data. The findings have motivated to investigate means of enhancing classification accuracies using feature generalization technique. Experimentation for the aforesaid purpose is carried out by examining with two different feature vector extraction techniques, namely, handcrafted technique and pretrained convolutional neural network (CNN) based technique. Further, fusion of extracted features using both the aforesaid methodologies is carried out to explore the possibilities of augmented classification results.

### II. LITERATURE SURVEY

Keyword searching is taken up as a popular method to trace the object of interest [11]. The technique tends to create numerous unessential search outcomes due to limited vocabulary of the user. Recent approaches of image-based searching have largely been influenced by content of the query image instead of its text label as a keyword [12][13][14]. The concept of identifying image data has started in early eighties[15]. Traditional feature extraction methods

have generated hefty feature vector sizes [16][17][18]. This has drastically increased the time for feature comparison and added up to space complexity for storage. Various low-level characteristics like shape, color, size etc. are exploited to extract hand crafted features from the image data [19]. Some of the prominent techniques are designed by means of image binarization [20]. The process of binarization involves threshold selection in three different varieties, namely, global, local and mean threshold selection [21]. The technique of global threshold selection is developed by Otsu and assorted local threshold selection techniques are developed by Niblack, Sauvola etc. [22]. Grey Level Co-occurrence Matrix (GLCM) and vector quantization are significant handcrafted techniques for feature extraction using image textures [23]. Popular handcrafted techniques like histogram of oriented gradients HOG, SIFT, SURF and so on have resulted in robust descriptor definition [24]. However, all these feature extraction techniques are based on a single property to extract features which has turned out to be a bottleneck for feature generalization in case of limited training data. Convolutional Neural Networks (CNNs) have readily addressed this limitation while extracting content-based image features [25]. CNN architecture performs complex computations for descriptor definition by considering various properties of image data [26]. Nevertheless, training a CNN from scratch is not always feasible due to high computational cost. Large number of varieties of pre-trained CNNs is available to

extract feature vectors from image data which has revealed high precision for classification task [27]. Nevertheless, pre-trained CNNs are only useful when they have enough training data for feature generalization during transfer learning.

The paper has identified this significant gap of reduced classification accuracy with restricted training image data and has attempted to address the same with feature generalization approach based on feature fusion. The results are encouraging and has shown improvement in classification accuracy over individual techniques.

### III. MATERIALS AND METHODS

The in this work have inspected the robustness of feature extracted using authors handcrafted technique and pretrained CNN based technique. Further, the features are fused to explore feature generalization resulting in higher classification accuracy. The experimentation is necessitated by the survey of positive user responses towards enhancement of classification accuracy while they search contents by image as in Table 1.

Analyses of Table 1 have shown significant association between user satisfaction and difficulty in identifying correct searching keyword. The value of the parameters of the test (Likelihood Ratio=275.817; Phi=1.28; Cramer's V=0.905 and p<0.01) signifies dissatisfied users with increased difficulty in framing query for searching.

CHI-SQUARE TEST				
Row variable	User satisfaction for factors affecting classification			
Column variables	Likelihood Ratio	Sig. (2-sided)	Phi	Cramer's V
Difficulty in identifying correct searching keyword	275.817	0.0001	1.28	0.905
Dissimilar outcome of search	54.004	0.0001	0.5	0.363
Inaccuracy & inefficacy	91.656	0.0001	0.674	0.477

**Table1.** Chi-Square Test of User level satisfaction

Similarly, dissimilar outcome with posted query (Likelihood Ratio=54.004; Phi=0.5; Cramer's V= 0.363 and p<0.01) and inaccuracy & inefficacy of search results (Likelihood Ratio=91.656; Phi=0.674; Cramer's V= 0.674 and p<0.01) are having huge relationshipwith user dissatisfaction for classification process. A sample size of 185 is considered for the survey.

Content based image descriptors eradicate the necessity of text query formation. This work has presented three

different procedures of descriptor definition to investigate improvement in classification results with feature generalization.

We have used Wang dataset as a testbed which has 1000 images equally spread over 10 different categories. A sample collage is given in Figure1 [18].



**Figure. 1** Sample Collage of Wang Dataset

### III A. HANDCRAFTED FEATURE EXTRACTION USING IMAGE BINARIZATION

Image binarization using local threshold selection is useful to identify the region of interest for feature extraction. Niblack's local threshold selection is used to extract feature descriptors from binarized images in the dataset. Color component wise local threshold determination of an image is performed by determining a pre-fixed sliding window of rectangular shape moving all over the gray values subsequent color component. The threshold of an image  $\theta(p,q)$  for a window size (25x25) is calculated locally for the portion covered by the sliding window at any instance and is given by the summation of mean of gray values denoted with  $\mu(p,q)$  and standard deviation of the gray values denoted by  $\delta(p,q)$  as in equation 1.

$$\theta(p,q) = \mu(p,q) + \varphi * \delta(p,q)$$

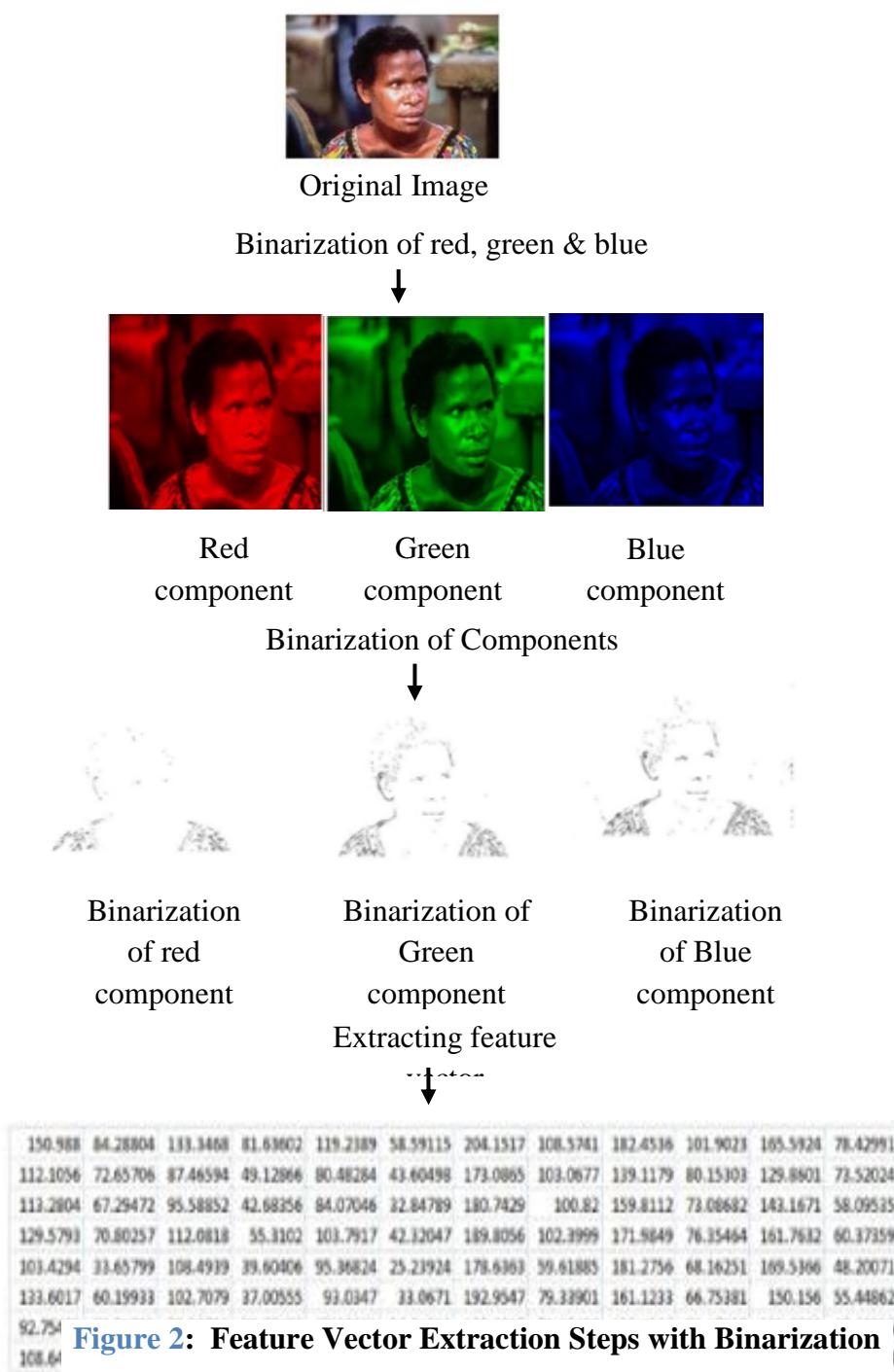
where,  $\varphi \in \{0, 1\}$

Here, the value of  $\varphi$  is considered as 0.6. The nature of binarization is subject to the size of the sliding window and the estimation of  $\varphi$ . The grey values for a given window are now compared to the local threshold value  $\theta(p,q)$  of the subsequent window. The comparison results in formation of two different clusters comprising of values greater than or equal to the value of the threshold and lesser than the value of the threshold. Furthermore, two sets of average values are calculated from pixels having higher or equal intensity compared to local threshold and lower intensity values compared to local threshold as in equations 2 and 3. The values thus computed resulted in designing the higher and lower intensity binarized feature descriptor for images.

$$X_{hi\_int} = \frac{1}{\sum_{m=1}^p \sum_{n=1}^q BitMap_x(p, q)} * \sum_{m=1}^p \sum_{n=1}^q BitMap_x(p, q) * X(p, q) \quad (2)$$

$$X_{lo\_int} = \frac{1}{p * q - \sum_{m=1}^p \sum_{n=1}^q BitMap_x(p, q)} * \sum_{m=1}^p \sum_{n=1}^q (1 - BitMap_x(p, q)) * X(p, q) \quad (3)$$

A demonstration of feature vector extraction steps with binarization technique is illustrated in Figure 2.

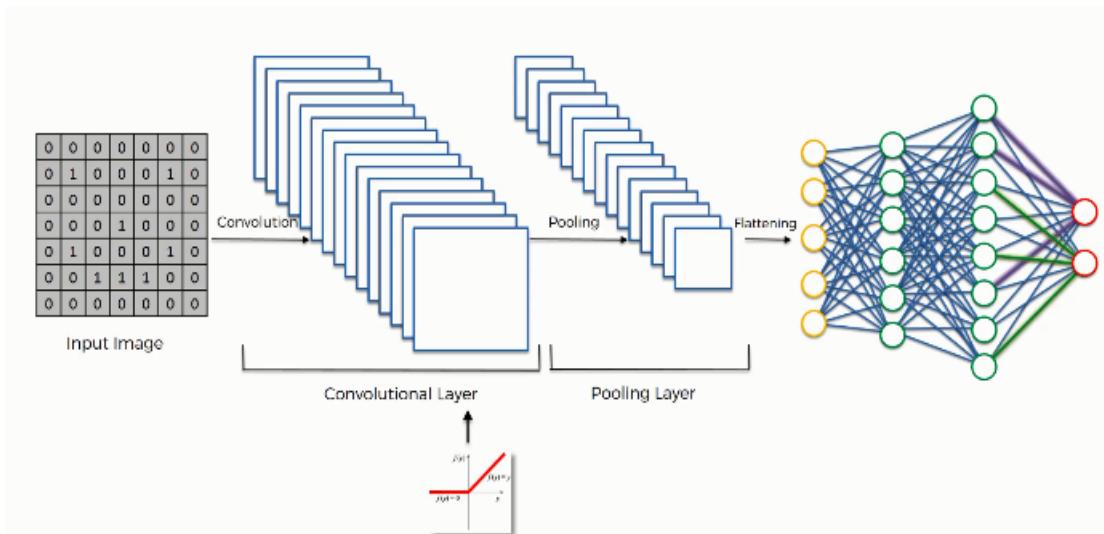


**Figure 2: Feature Vector Extraction Steps with Binarization**

### III B. FEATURE EXTRACTION USING PRE-TRAINED CONVOLUTIONAL NEURAL NETWORK (CNN)

A pretrained CNN architecture named MobileNetV2 is used for feature extraction from the database images. A

sample diagram of a fully connected convolutional neural network (CNN) is shown in Figure 3. The training is carried out on ILSVRC12 ImageNet dataset [28].



**Figure 3:** Feature Vector Extraction Steps with Binarization

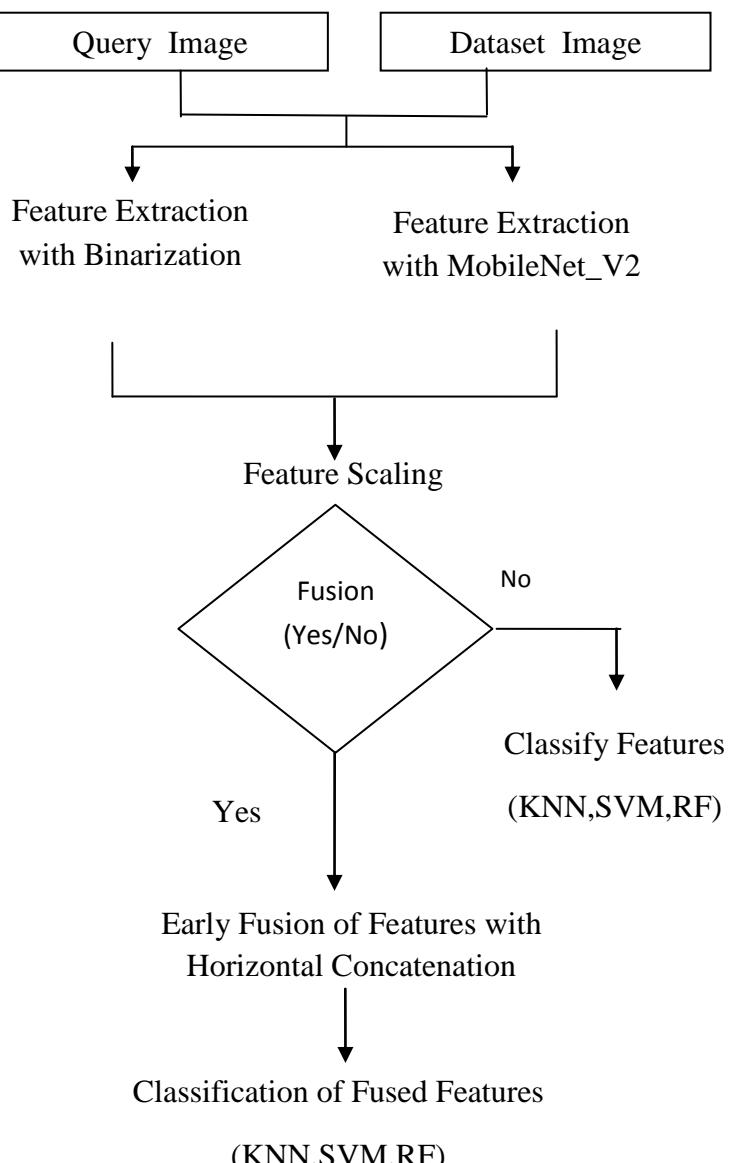
### III C. FEATURE FUSION ARCHITECTURE

Finally, we have developed a fusion based descriptor by horizontally concatenating the normalized feature vectors

extracted using handcrafted technique and with pretrained CNN as in Figure 4.

The process of normalization is based on feature scaling technique as in equation 4.

$$f' = \frac{f - \min(f)}{\max(f) - \min(f)} \quad (4)$$



**Figure 4.** Classification Architecture for individual / fused features

The classification results are computed by considering 10-fold cross validation to avoid overfitting. Two different metrics are considered for classification performance

measurement, namely, precision and recall as in equations 5 and 6.

$$\text{Precision} = \frac{TP}{TP + FP} \quad (5)$$

where,  $TP$  = True Positive

$FP$  = False Positive

$$TPRate / Recall = \frac{TP}{TP + FN} \quad (6)$$

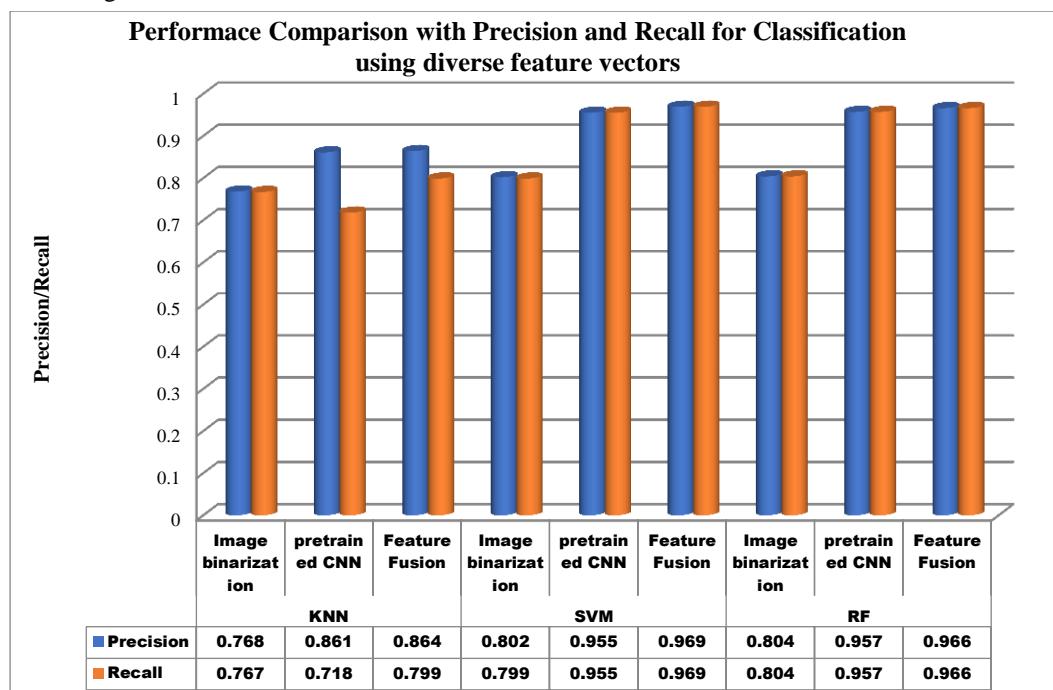
#### IV. RESULTS AND DISCUSSION

The assessment of performance is completed in 10 trials by the classifiers. Two different categories of classifiers, namely eager learner (SVM and Random Forest) and lazy learner (kNN) have performed the evaluation process.

Figure 5 is showing the comparison of precision and recall values for two different categories of descriptors. Results in Figure 5 shows that feature extraction using pre-trained CNN is having significant increase in classification results compared to the handcrafted technique. But, due to limited

training images, the classification results are not very impressive even using CNN as feature extractor. However,

a significant rise in precision and recall values are observed with feature fusion.



**Figure 4:** Comparison of Classification Performance for various techniques

The classification results with feature fusion have outclassed the results evaluated using individual features. This has clearly established the efficacy of feature fusion to leverage feature generalization for enhanced classification results in case of limited training data. Process of feature fusion has considered multiple properties of image content to create a generalized descriptor resulting in higher precision. This has indicated the importance of considering diverse image characteristics during content-based descriptor definition from image data. Hence, the feature fusion technique can well be implemented to enhance user satisfaction for searching using content based image classification.

## V. CONCLUSION

The paper has successfully proposed feature fusion technique as a method to achieve feature generalization

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with respect to conventional approaches. It has emphasized the fact that the descriptor definition techniques must consider multiple facets of the image characteristics. The theory is established by achieving augmented accuracy with fusion based descriptors prepared with combination of pretrained CNN based features and handcrafted features. Proposition of fusion based approach has also proved beneficial to ensure feature generalization with restricted training images by designing robust features with combination of assorted varieties of feature vectors. The approach discussed in this work may be extended towards new direction for innovation and value addition in designing content-based image classification solutions in diverse domain.

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## AN EXPLORATORY STUDY ON THE DIMENSIONS OF WOMEN'S ECONOMIC EMPOWERMENT

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### ABSTRACT

*Globally, women's empowerment has gained momentum to reduce gender inequality in order to meet the 5<sup>th</sup> Sustainable Development Goal. Despite numerous studies on women's economic empowerment, a consensual understanding of the concept is missing. Hence, the purpose of this study is to review published research on women's economic empowerment (WEE). This exploratory study has explored research articles and reports from reliable sources to form a thematic review using version 12 of NVivo. The study, identified critical themes from the reviewed literature using NVivo 12. Unexplored areas such as measurement issues in WEE, a debatable topic, have been probed. The results indicate attributes of empowerment frequently cited in the literature. The paper also recommends future research directions to examine antecedents of WEE in the Indian context.*

**Keywords:** Women, Economic empowerment, Development, Measurement

### 1. INTRODUCTION

The United Nations 2030 Agenda for Sustainable Development provides a transformative framework for the advancement of the three dimensions of sustainable development i.e., economic, social and environmental. It envisages an inclusive and sustainable economic growth model for all (United Nations, 2015). Through its 17 sustainable development goals (SDGs), the transformative agenda seeks for greater equality and prosperity for the disadvantaged groups. Though women and girls play a pivotal role in all the Goals, SDG 5 aims exclusively on achieving gender equality and the empowerment of girls and women. Its foundation is laid on the strength of the

relationship between gender inequality and all aspects of sustainable development (Esquivel and Sweetman, 2016).

In 2020, the Global Gender Gap Index (GGGI) ranked India at 112<sup>th</sup> position out of a total of 153 countries (World Economic Forum, 2019). In the Economic Participation and Opportunity sub index, India scored a dismissal rank of 149. Within the labor market, only 22% of women are engaged actively as compared with 82% of men. This is one of the lowest participation rates in the world (145<sup>th</sup>). Furthermore, female earnings have been reported to be one-fifth of the male income, also one of the world's lowest. Table 1 gives India's indicator-wise rankings of GGGI's economic participation and opportunity subindex.

**Table 1: Indicator-wise India's GGGI Ranking**

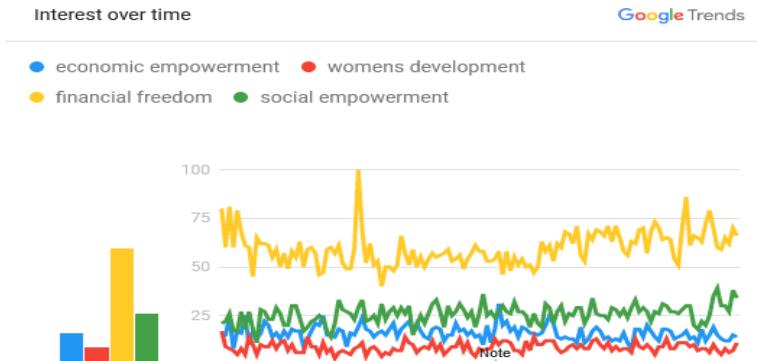
Gender-gap Indicator	Participation (%)	Rank
Women's labor force participation rate	22	145
Female estimated earned income	-	144
Wage equality for similar work	-	117
Leadership roles	14	136
Professional and technical workers	30	132
Parliament representation	14.4	122

*Source: World Economic Forum's Gender Gap Index (2020)*

These rankings summarize the precarious condition of women in the Indian society. It underlines the fact that economic gender disparity runs deeply in India. Hence there is a need to explore and understand the concept of empowerment through its various dimensions and contexts to assess why women are significantly disadvantaged compared to men.

A thorough and comprehensive search of the research topic terms was carried out on Google Trends to measure their interest and popularity across geographical regions and time period. Figure-1 depicts a consistent and increasing interest of the search queries 'economic empowerment', 'womens development', 'financial freedom' and 'social empowerment' from the Google Trends datasets. This also validates the significance of the topic taken up in the study.

Figure 1: Google trend line for terms related to women's economic empowerment



Source: Google Trends as accessed on 11/03/2021

This paper aims to contribute to a more complete understanding of women's economic empowerment through a literature review. Taking this into consideration, this study attempts to answer the following questions:

*RQ1.* How literature review can help form a thematic view of women's economic empowerment?

*RQ2.* How NVivocan help explore literature review using Word Tree and Word Cloud analysis?

The paper is divided into four sections. First section is a brief background of women empowerment followed by the literature review in second section. Section three covers methodology whereas results are covered in section four which are exploratory in nature. Section five covers conclusion. And finally, limitations of the study and future research directions are discussed in section six.

## 2. LITERATURE REVIEW

Literature has been reviewed to provide a theoretical understanding of the concepts of women's economic empowerment and its measurement.

### THE CONCEPT OF WOMEN'S EMPOWERMENT

Researchers as well as practitioners from different fields have made significant contributions to the understanding of the dynamic idea of empowerment over the years. Renowned economist Amartya Sen's work helped empowerment formally enter the domain of development economics. He stressed on the expansion of people's choice-their freedom(Sen, 1999). Recently, empowerment has entered the field of behavioral economics-which is an amalgamation of psychology and microeconomic concepts of human behavior. Nobel laureates Abhijit Banerjee and Esther Duflo have conducted several observations and experiments to link the behavior of poor people with their empowerment dimensions(Banerjee and Duflo, 2012).

Women's empowerment not only promotes inclusive growth but has been universally accepted to having social, political moral and economic benefits(ICRW, 2011). It has been defined as a "process of change" and entails the shift from disempowerment to empowerment(Kabeer, 1999).

Both, Amartya Sen and Naila Kabeer have laid the foundation for researchers to further explore the functional and instrumental aspects of women's empowerment.

### WOMEN'S ECONOMIC EMPOWERMENT AND IT'S DIMENSIONS

Many researchers have correlated women's empowerment with their economic perspectives(ICRW, 2011; Siddik, 2017). Several studies have established the indicators of women's economic empowerment. First, the empowerment process can be broken down into three inter-related components namely resources, agency and achievements(Kabeer, 1999). Resources are defined as the enabling factors comprising of material, human and social resources. Agency is defined as the essence of empowerment puts women themselves responsible for improving their positions. And finally achievements are the outcomes of the empowerment process. Second, along with the previously mentioned dimensions, norms and institutions also contribute towards empowerment(ICRW, 2011). They are social and organisational systems that define and govern behavior. Third, education is a key ingredient for women to lead autonomous lives and have freedom to act(Chakrabarti and Biswas, 2012; Ghosh, Chakravarti and Mansi, 2015). Fourth, financial well-being also contributes towards economic empowerment(Deka, 2015; Haque and Zulfiqar, 2016). In addition, effective financial inclusion strategies also help improve economic empowerment outcomes(Holloway, Niazi and Rouse, 2017). Many more complex domains have been worked upon by researchers to understand the multidimensionality of economic empowerment.

### MEASURING WOMEN'S ECONOMIC EMPOWERMENT

Empowerment is difficult to measure as many researchers have described it as a process rather than a state. Some studies have used indirect measures comprising of observable characteristics like earnings, education, labor force participation rates and micro credit use as proxy of empowerment(Gupta and Yesudian, 2006; Garikipati, 2012; Ghosh, Chakravarti and Mansi, 2015). However,

these proxy measures have been widely criticised on the basis that they are context dependent and do not capture and separate all empowerment dimensions(Jejeebhoy and Sathar, 2001; Agarwala and Lynch, 2006). On the other hand, direct measures comprising of decision making power, access and control over resources and choice have helped tackle the shortcomings of the indirect-measure approach(Goetz and Gupta, 1996; Agarwala and Lynch, 2006). At times, only simple measures like women's productivity and earnings are taken as proxies to measure the intricate concept of empowerment(Buvinic and Furst-Nichols, 2014). Irrespective of the proxy measures used, women's economic empowerment chiefly focusses on two areas namely, women's labor market outcomes and their participation in household economic decision-making.

WEE has been commonly measured through standardised indices. The most prominent is the Gender Development Index (GDI) and the Gender Empowerment Measure (GEM) developed by the United Nations Development Programme (UNDP). The GDI analyses changes in women's economic situation by measuring the access, participation and outcome of their formal economic activities. The GEM measures women's economic and political decision-making. Another indicator developed by the World Economic Forum (WEF) is the Global Gender Gap Index(GGG), which focuses on outcome rather than on inputs.

Though literature suggests both qualitative and quantitative approaches to measuring women's economic empowerment, many studies adopted a mixed-method approach to effectively evaluate change and outcomes(Pereznieta and Taylor, 2014). Theoretical literature review found that there was a paucity of studies in WEE in context to India.

### 3. METHODOLOGY

The review process was divided into three stages: an initial literature quest, a narrowing of the field of study, and finally, a review. A comprehensive search of web-based databases was conducted to identify as many relevant academic and grey literature, as possible. The author assessed databases, such as ProQuest, ResearchGate and Google Scholar to search for suitable research papers in English language only. A myriad of terminology like, "women's empowerment", "women's decision-making", "gender empowerment", "gender equality" etc., were applied on the search engines as literature is inconsistent and vague on the concept of empowerment. Search was customised to find published papers between 2008 and 2020 only. An exception was made for Kabeer (1999) due to its high citation count of 4351. In total, full-text of 29 papers was thoroughly read and only 12 papers(Table 2) were finally chosen for review based on the above mentioned criteria. Like with any other primary research, an integrative review must also comply with standards of methodological rigour(Cooper, 1998). The approach used to evaluate and interpret the related components closely resembles current practices.

The tools used for analysis were tailored to collect knowledge required to address the research questions. After reading the papers several times, they were imported into NVivo Version 12 for a thematic analysis in the form of Word Tree, Word Cloud and Word Frequency. We followed numerous data-cleaning steps, such as elimination of stopwords as well as stemming. Similar to stop words, it's critical to remove text features that don't add value and obstruct the research method. Word cloud has been used to visualise key words voiced out by various authors through select review papers for thematic view.

**Table 2: List of 12 studies selected for the final review**

S.No.	Study	Journal	Description
1.	Pieters & Klase (2020)	World development,	Purpose: To discuss learnings from intervention programmes on microfinance, business training, etc. aimed at increasing women's employment and earnings. Context: Global
2.	Laszlo et al. (2020)	World development,	Purpose: To propose a new framework to measure intra-household decision-making. Context: Global.
3.	Hendriks (2019)	Development in Practice	Purpose: To establish causality between financial inclusion and women's economic empowerment. Context: Global
4.	Kumari & Ferdous Azam, (2019)	International Journal of Scientific & Technology Research	Purpose: To examine the mediating role of financial inclusion on financial literacy and women's economic empowerment. Context: Sri Lanka
5.	Fox & Romero (2017)	Policy Research Working Paper, The World Bank	Purpose: Aims to develop a more domain specific measure of women's economic empowerment. Context: Global
6.	Haque & Zulfiqar (2016)	International Journal of Business and Social Science	Purpose: To explore the relationship between financial literacy, financial behavior, financial well-being and women's economic empowerment. Context: Pakistan
7.	Buvinic & Furst-Nichols (2014)	The World Bank Research Observer	Purpose: Evaluate intervention initiatives aimed at women's economic empowerment. Context: Global
8.	Pereznieta & Taylor (2014)	Gender & Development	Purpose: To review development interventions aimed at promoting of women's economic empowerment. Context: Global
9.	Postmus et al.( 2013)	Journal of Family and Economic Issues	Purpose: To determine if there is a connection between financial literacy and women's economic empowerment among abused women. Context: USA
10.	Kabeer (2012)	International Development Research Centre	Purpose: To establish a causality between gender equality and economic growth. Context: Global
11.	Kapitsa (2008)	Division for the Advancement of	Purpose: To review the different measurement indices of women's economic

		Women	empowerment. Context: Global
12.	Kabeer (1999)	Development and change	Purpose: To analyse the methodologies used to measure women's economic empowerment. Context: Global

#### 4. FINDINGS

The NVivo analysis of the selected papers helped identify and validate the key terms frequented in the women's

empowerment literature. Table 3 shows the identified words that represent the topic. Women's economic empowerment is frequently equated with development and measurement.

**Table 3: Word Frequency Analysis**

Word	Length	Count	Weighted Percentage	Similar Words
womens	6	902	2.94	women, women's economic, womens
empowerment	11	398	1.30	empowerment, empowerment'
economic	8	393	1.28	economic, economically, economics
development	11	265	0.86	develop, developed, developing, development, developments, develops
measuring	9	253	0.82	measurability, measurable, measure, measured, measurement, measurements, measures, measuring

Next, a word cloud analysis was conducted on the selected 12 research papers. Figure 2 helps visualise the different dimensions of the main theme. Power,

participation, outcomes, income and research were the key issues identified.

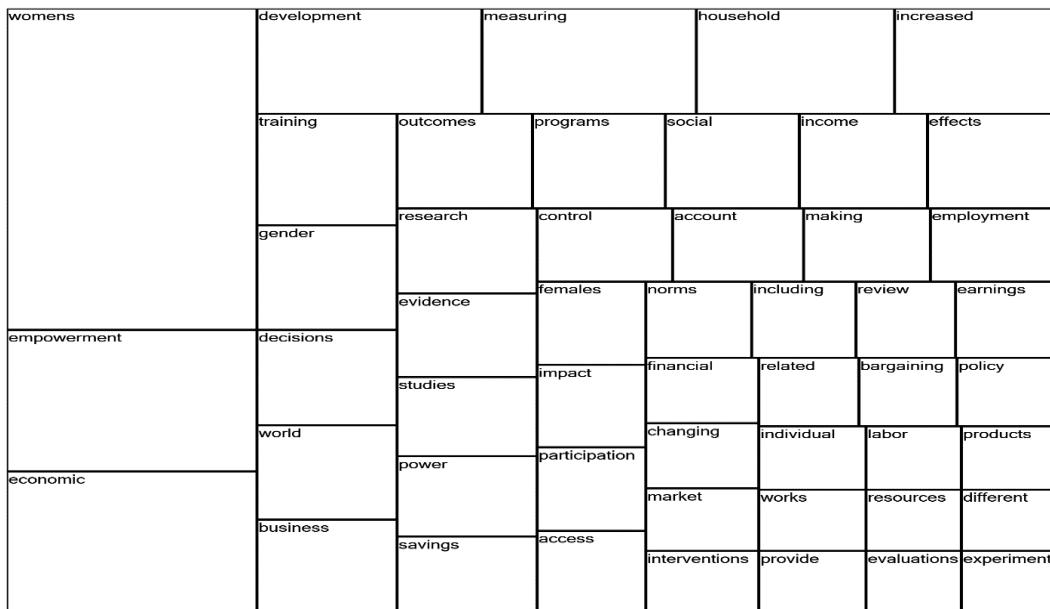
Figure 2: Word Cloud of the Review Papers



Further, the selected papers were also analysed for a hierarchy chart as shown in Figure 3. Next to the already identified heavy themes of women, empowerment and economic are the smaller boxes represented by

development, training, decisions, measuring, household, savings etc. These themes help understand the complexity of the main theme.

Figure 3: Tree Map of the Themes



Overall, women's economic empowerment can be explored from a number of directions. It is an intricate web of innumerable sub-themes which can be explored in different contexts.

## 5. CONCLUSIONS

The review has attempted to analyse the selected studies to draw conclusions on the thematic view of WEE. As results have indicated, empowerment has spill-over effects in other domains as well and hence cannot be defined in purely economic terms. Women's active participation in social, economic, political activities helps them gain respect and trust, contributes to positive changes in society's understanding and mind-set, and offers policymakers guidance on how to develop women-related initiatives, policies, and schemes as required. While conducting this review, the researcher observed that there is a lack of good quality research literature on WEE in the Indian context. Most studies were found to have been conducted in the African region, Bangladesh and Sri Lanka. Also, most studies were found to be qualitative in nature. Though qualitative analysis is vital to understand the process of change, mixed-method evaluations would provide a more holistic understanding of the nature and changes in economic status.

## 6. LIMITATIONS AND FUTURE RESEARCH SCOPE

The present study has a few limitations which opens up avenues for further research. Present study is more focussed towards the economic aspect of empowerment. However, further analysis can be conducted on the different empowerment dimensions and their relationship with

economic empowerment. Also future research can focus on more quantitative approach to understand the multidimensionality of WEE. Further, studies related to antecedents of women's empowerment from rural as well as urban sector could be an interesting scope for further studies.

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## SCHOOL EXPERIENCE PROGRAMME: PATHWAY FOR PROFESSIONAL DEVELOPMENT OF INTERNS

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### ABSTRACT

If you want to be a teacher School Experience Programme (SEP) can help strengthen your professional skills and more experiences increase your chance to be a professional. Teacher Professional Development (PD) has been in high demand during the last decade. This paper is an attempt for highlighting the importance of SEP for PD of interns (future teachers) as there is a strong need for teacher professional development. In this paper the researcher has noticed the seamless connection between SEP and PD as an intern continues his/her school experience programme, the professional development acquired.

**Keywords:** School Experience Programme, Professional Development, Interns

### INTRODUCTION

Education is a continuous and technical process imparting knowledge, developing skills, and necessary experiences to create a human force for the development of modern society. If a country wants to maintain quality education it must possess a team of qualified teachers. For quality teachers, a teacher training programme must contain a strong discipline of academic rigidity and maintain challenging intellectual experiences for the production of interns. A teacher can well perform his/her multifarious tasks and duties only if he/she is updated for knowledge professionally regularly and an intern learns this through SEP. Sadia (2020) depicts the impact of the internship programme on the professional and personal growth and skills of the business students of Pakistan. Rebica, an intern at Urnis College in Biochemistry and Molecular Biology shared her experience that she gets opportunities to learn practical skills in the laboratory during the internship.

### SCHOOL EXPERIENCE PROGRAMME

An Internship which is also known as School Experience Programme(SEP), a formal school designed to cater to the needs of students to further study and gain experience in professional career interests. It is one of the points of inflection of the teacher's professional career. It is the time graph when the intern molds himself/herself to equip with good knowledge covering all aspects of the training program. The basic role of the intern is to take up responsibility, active participation in the student teaching tasks. During the internship programme, the interns get actively involved in extensive/ direct experimentation in a school under the supervision of the trained staff of teachers in college and the sponsoring school (an institution in which intern go under their practical training) to learn the various dimensions as the profession of teaching and to acquire good competencies required for initiation of the teaching profession as a career. The programme is particularly field-based for the intern to get experience in the real problem field of specialization that a practitioner to

deal with every sphere of the education system. It helps pre-service teachers (interns) to get an opportunity to delineate 'teaching options' in a favorable supportive environment and also build confidence and self-belief.

### The Aim and Objectives of the School Experience Programme

School Experience Programme is designed to:

Provide multi-dimensional opportunities to students for development and update their workplace skills.

- I. Offer opportunities to explore the possibilities of a 'future orientation' program.
- II. Foster a good association between schools, students, and university programs.
- III. Provide an opportunity for the students to analyze their Strength, Weakness, Opportunities, and Threat (SWOT).

### Professional Development

Professional Development very often refers to supporting people in the workplace to guide and understand more about a variable, the environment of work, the job they accomplished, and how it can be done better. In the educational profession, a student always expects to be taught by an experienced, knowledgeable, skilled, expert in his/her field of specialization, kind and sympathetic teacher.

Tagore (creative unity 1922, p.203) has rightly stressed that a "good teacher should function like a 'burning lamp', which burns itself and enlighten others". In the present-day world, such type of image can be gainfully managed by a teacher when he is a true professional and keeps in mind the teaching professional ethics throughout the career.

### **Stages of Professional Development**

The stages of Professional Development are listed below:

- I. First stage:Knowledge gain
- II. Second stage:Screening models
- III. Third stage:Reflection on practice
- IV. Fourth stage:Shifting Practice
- V. Fifth stage:Gaining & Sharing experience

### **Seamless Connection between School Experience Programme& Professional Development**

Professional Development is incomplete without the practical experience gained and the same is expected from Teacher Education. The practiced experience is one of the compulsory elements of all internship programme for the development of skills and professional competence for producing good teachers. The professional development course curriculum coupled with the input of theory and practice is known by School Experience Programme. In

2010, A review committee established by NCTE recommended an internship (SEP) model for adoption in respect of teacher education a short theoretical orientation program followed by a 3 to 5 year guided having taught in a school under the guidance of mentor teachers, greater attention on school internship and reflective practice with perspectives on the individual learner and her context, contemporary society, fundamental concepts of different components of education and curricular and available pedagogic alternatives that lead to professional development.

### **School Experience Programme: Pathway to Professional Development**

SEP is a pre-service training in teacher education programme with five objectives that are inter-linked with the five stages of professional development. In this section, the researcher has tried to present a brief overview showing the connection through discussion on how SEP promotes PD.

<b>Objective of SEP</b>	<b>Stage of Professional Development</b>	<b>Discussion on Interlinked connection</b>
To provide multi-dimensional opportunities to students to develop their workplace skills.	Knowledge gain	SEP provides multi-dimensional opportunities to gain new knowledge, collect necessary information, and focus on the conceptual feeling of the workplace. In this phase, an action like goal and priority setting, assessing requirements, attending, and actively interacting in the workplace that is the base of Professional Development.
To provide multi-dimensional opportunities to students for updating their workplace skills.	Screening models	Interns get opportunities for screening models at their workplace for updating their skills through participating in all activities like school and classroom rounds, peer discussion, using instructional artifacts, planning to develop and listening or watching audio-visual system of presentation.
To offer opportunities to explore the possibilities of a 'future orientation' program.	Reflection on practice	Future orientation programme offer opportunities to analyze instructional plans and procedures based on new concepts of knowledge through maximum use of journals and periodicals or teacher authored cases for fellow discussion and its reflection on the minds of the others during the School Experience Programme.
To foster a good association between schools, students, and university programs	Shifting Practice	To foster a good association between schools, students, and university programs SEP transform new knowledge into a nucleus and collaborative programs and action for further instructional change that leads to professional development.
To provide an opportunity to the students to analyze their Strength, Weakness, Opportunities, and Threat (SWOT)	Gaining & Sharing experience	Gaining & Sharing experience is an opportunity for the interns to analyze their Strengths, Weakness, Opportunities, and Threat to continue to refine their professional development.

### **CONCLUSION**

From the above discussion, it can be observed that School Experience Programme objectives are interlinked with the stages of professional development. Hereby it can be suggested that if an intern goes through the SEP and attains the objectives of the programme his/her professional development simultaneously developed.

During SEP interns are engaged in substantive work requiring problem-solving, communicating with students, and classroom management. The majority of intern's time is spent engaging them in professional activities. From the discussion, we observe that interns will develop a personal work ethic and be able to investigate their career interests, teaching goals and all this leads to professional development. As per today's requirement, the policymaker

should fuse the resources of universities and school districts in creating seamless connections between school experience programme and on-going professional development.

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## ENDURANCE OF OEMS THROUGH EFFECTIVE HRD CLIMATE

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### ABSTRACT

**Purpose:** The purpose of this paper is to extend the endurance strategy of selected Original Equipment Manufacturers (OEMs) of Bhavnagar District of Gujarat State, from the perspective of HRD Climate by investigating how OEMs survive. Total 260 respondents participated in this research study. Number of respondents from category A Cluster is 147 Employees (Executives 58, Non Executives 89). Number of respondents from category B Cluster is 93 Employees (Executives 24, Non Executives 69). Number of respondents from category C Cluster is 20 Employees (Executives 08, Non Executives 12).

**Design/Methodology/Approach** – This paper is based on original questionnaire by Prof (Dr) T.V. Rao, which was restructured due to the local population of Bhavnagar district by the researcher. The research questionnaire is based on likert's five point scale. This cross-sectional study is conducted in Bhavnagar District. This paper offers an analysis of General Climate, OCTAPAC and HRD mechanism and its impact on each employee's performance in selected Original Equipment Manufacturers (OEMs) of Bhavnagar District of Gujarat State.

**Findings** – The main finding is that overall HRD Mechanism in selected OEMs of Bhavnagar District was truly at Good level in reliability test (Cronbach's Alpha). The Value of Cronbach's Alpha (.903) for Overall HRD climate is a Good level of internal consistency prevailing in selected OEMs of Bhavnagar District, which indicates a good sign for selected OEMs growth. It shows that their employees are satisfied with the working environment, climate and culture. The group average Mean of the items was found to be (74.32) with a standard deviation of (10.083).

**Originality/value** – This research paper gives a more complex understanding of General Climate (GC), OCTAPAC, HRD Mechanism and Overall HRD climate prevailing in selected OEMs of Bhavnagar District.

**Keywords:** General Climate (GC), OCTAPAC, HRD mechanism, HRD Climate Original Equipment Manufacturers (OEMs), Bhavnagar District.

### INTRODUCTION

An Original Equipment Manufacturer or OEM is a company that resells products or parts of a product of another company to its own customers while putting the products under its own branding. OEMs usually operate in the IT and computer industries. An OEM is often the direct client of a manufacturing company and its reseller to specific consumers. For instance, a Lenovo laptop computer's parts aren't all manufactured by Lenovo because some parts, such as its processor or memory module, may be the products of another company. The original equipment manufacturer, or OEM, is a very important source of supply for most manufacturers.

Items produced by these OEMs include Earth Moving, Mining & Mineral Processing, Railway, Steel Plants, Cement, Energy, Valves & Pumps, Electro Locomotive, Aerobridge, Oil Exploration, Shipping, General Engineering, Automotive, Aerospace, Turbochargers for Diesel Engines, Power plants, Pumps & Valves, Medical Implants, Electrical & Instrumentation, Electronics, Compressors, Artisan Castings, Machined Components from Barstock, Defence, Saddle that eventually become part of the manufacturer's finished product. The traditional

connection between the OEMs and more dominant manufacturing customers has been somewhat unpredictable.

### LITERATURE REVIEW

Peter and Waterman Et. al. (1982) suggest that Organization Culture (OC) can impact execution and devotion in a Firm and a high level of organization execution is connected to a well-manufactured culture that is a culture with very much fused and triumphant arrangement of ethics, confidence and moral conduct. Rao (1984) led an exploration to recognize HRD atmosphere in Indian Firms. The examination uncovered that the General Climate (GC) was very little great to HRD because of absence of enthusiasm of the workforce to their individual enlargement. The top organization in the greater part businesses was not improving enough torments to get the nature of work life. Srivastava and Sharma (1984) recognized in his examination the nearness of the empowering join among OC and employment fulfillment. Jitendra G, Suresh Rao et. al. (2018) directed research on "Effect of Demographic factors on view of HRD implementation with effective utilisation of

Employees' Performance in Textile Industry of Andhra Pradesh" and found in their exploration study that out of 375 Managers in Textile Industry, a large portion of this examination demonstrates that Employees see one another however they never bolster each other in their occupations.

### RESEARCH GAP

There was few research studies carried out on OEMs and HRD Climate with special reference to bottom level employees working in selected OEMs of Gujarat State with special focus on Saurashtra Region. In 21<sup>st</sup> century its truly high level of competition, if companies wants to survive, it's needed to identify the various factors, one of them is HRD Climate. It consists three parts 1. General Climate (GC), OCTAPAC and HRD Mechanism. It was found that in OEM sector, no proper research studies conducted with specific to Bhavnagar District.

### RESEARCH METHODOLOGY

Primary Objective is to study the HRD Climate prevailing in selected OEMs in Bhavnagar District. Secondary Objectives includes to study the differences in the perception of employees based on gender, to study the differences in the perception of employees based on age, to study the differences in the perception of employees based

on designation (Cadre), to study the differences in the perception of employees based on Education qualification. Research Design used for the purpose of research study is Single Cross Sectional Descriptive Research Design. Data collection tool used for this research work is Structured Questionnaire. The Population of the Study is the employees working in OEMs in Bhavnagar District. A tool for data collection used is a Questionnaire (Structured). Sampling Unit used is employees working in OEMs and Sampling Design used for the purpose of the research study is Non Proportional – Quota Sampling. Total 260 respondents participated in this research study which is further divided into 3 clusters. Number of respondents from category A Cluster is 147 Employees (Executives 58, Non Executives 89). Number of respondents from category B Cluster is 93 Employees (Executives 24, Non Executives 69). Number of respondents from category C Cluster is 20 Employees (Executives 08, Non Executives 12).

### LIMITATIONS OF THE STUDY

Primary data relevant for the study may be much depended upon the co-operation of the respondents. Respondent's opinion can be biased, which cannot be ruled out and the geographical limitation (research study limited to Bhavnagar District Only).

### DATA ANALYSIS AND INTERPRETATION

Table No.: 1 Gender of Respondents		
Gender	Respondents	Percentage
Male	243	93 %
Female	17	7 %
Total	260	100 %

Table No. 1 shows total number of respondents and their Gender. Out of Total **260** Respondents **243 (93%)** were **Male** and **17 (7%)** were **Female**. Researcher observed with this information that, in general, employees working in

OEMs of Bhavnagar District, most of them are Males even as observed in this research too. Very limited numbers of Females are working in this segment for the specific region.

Table No.: 2 Cadre of Employees Working in OEMs.		
Employee Cadre	Respondents	Percentage
Executives	115	44 %
Non Executives	145	56 %
Total	260	100 %

Table No. 2 shows information regarding cadre of employees working in OEMs of Bhavnagar. Out of Total Respondents **145 (56%)** were **Non Executives** and **115 (44%)** were **Executives**. Its show that in Bhavnagar

District executives and Non Executives both categories of respondents provided their honest responses in regards to their organization's Human Resource Development climate.

Table No.: 3 Education of Employees Working in OEMs.		
Education	Respondents	Percentage
Below Graduate	118	45 %
Graduate	99	38 %
Post Graduate	43	17 %
Total	260	100 %

Table No. 3 shows information regarding the education qualification of the employees working in selected OEMs of Bhavnagar. Out of Total Respondents **118 (45%)** were **Below Graduate** but still most of them are practically

active regarding their work, followed by **99 (38%)** **Graduate** and **43 (17%)** were **Post Graduate**. Some of them just graduate still working as Executive cadre in their respective organization

Table No.: 4 Age of Employee working in OEMs

Employees Age	Respondents	Percentage
21-30	129	50 %
31-40	19	7 %
41-50	61	23 %
51-60	51	20 %
Total	260	100 %

Table No. 4 gives information about the age of respondents. Out of Total Respondents Majority of the employees **129 (50%)** were belongs to the age group **21 – 30** years followed by **61 (23%)** were in age group **41 – 50** years, **51 (20%)** were in age group **51 – 60** and **19 (7%)** were in age

group **31 – 40** years. Thus, majority of the respondents (50%), belong to a comparatively younger age. This age group is generally looked upon as energetic and efficient age group.

Table No.: 5 Awareness about HRD Climate.

Awareness	Respondents	Percentage
Yes	223	86 %
No	37	14 %
Total	260	100 %

The above Table No. 5 gives information about the awareness on HRD Climate. Out of Total Respondents **223**

**(86%)** were **aware about HRD Climate** and **37 (14%)** were **not aware about HRD Climate**.

Table No.: 6 Reliability Test – General Climate

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	
.714	.716	2	
Scale Statistics			
Mean	Variance	Std. Deviation	N of Items
8.75	1.634	1.278	2

The Value of Cronbach's Alpha **(.714)** for **General Climate** in Selected OEMs shows that there is an **Acceptable level** of internal consistency prevailing in OEMs located in Bhavnagar District, which shows that there is a **still need to Improve General Climate** for

continuous growth and development in Selected OEMs. The Mean score of employees working in OEMs of Bhavnagar District for General Climate put together **(8.75)** and Standard Deviation (SD) **(1.278)**

Table No.: 7 Reliability Test – OCTAPAC

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	
.840	.841	10	
Scale Statistics			
Mean	Variance	Std. Deviation	N of Items
41.25	29.632	5.444	10

The Value of Cronbach's Alpha **(.840)** for OCTAPAC which indicates, **Good level** of internal consistency for Reliability of OCTAPAC prevailing in OEMs of Bhavnagar District. As here it has found that **people trust on each other** and they even shares their

personal problems with their seniors and subordinates. The overall OCTAPAC prevailing in the selected OEMs of Bhavnagar District seems to be mean score **(41.25)**. Standard Deviation (SD) for OCTAPAC put together is **(5.444)**.

Table No.: 8 Reliability Test – HRD Mechanism

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	
.719	.782	6	
Scale Statistics			
Mean	Variance	Std. Deviation	N of Items
24.32	16.667	4.083	6

The Value of Cronbach's Alpha **(.719)** for **HRD Mechanism** in Selected OEMs shows that there is a **Acceptable level** of Internal consistency prevailing in OEMs located in Bhavnagar District, which shows that

there is no much need to improve **HRD Mechanism** in Selected OEMs. The group average Mean of the items was found to be **(24.32)** with a standard deviation of **(4.083)**.

Table No.: 9 Reliability Test – Overall HRD Climate			
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	
.903	.914	18	
Scale Statistics			
Mean	Variance	Std. Deviation	N of Items
74.32	101.670	10.083	18

The Value of Cronbach's Alpha (.903) for **Overall HRD Climate**, Which indicates **excellent level** of internal consistency for Reliability of OCTAPAC prevailing in OEMs of Bhavnagar District. Overall, putting together all

the three sectors of business, it is evident that excellent HRD climate was prevailing in the OEMs of Bhavnagar District as Mean score is (74.32) and Standard Deviation is (10.083).

Table No.: 10 CHI-SQUARE Analysis						
HRD Climate Awareness Among employees V/s Employee Cadre (Cross tabulation)						
Employee Cadre	Executive		Are You Aware About HRD Climate?		Total	
			No	Yes		
		Count	1	114	115	
	Non Executive	Expected Count	16.4	98.6	115.0	
		Count	36	109	145	
		Expected Count	20.6	124.4	145.0	
Total		Count	37	223	260	
		Expected Count	37.0	223.0	260.0	

Table No.: 11 Case Processing Summary (CHI SQUARE Analysis)						
Cases						
Valid      Missing      Total						
	N	Percent	N	Percent	N	Percent
Employee Cadre * Are You Aware About HRD Climate?	260	100.0%	0	.0%	260	100.0%

## FINDINGS

129 (50%) respondents (belongs to age group 21-30 years) believed that they are getting enough freedom and importance in their concern organization. 51 (20%) respondents (belongs to age group 51-60 years) believed that their concern organisations' policies facilitate employees' development. 129 (50%) respondents (belongs to age group 21-30 years) believed that their concern organisations' top management putting efforts to identify and utilize their potentials. 129 (50%) respondents (belongs to age group 21-30 years) believed that they are getting enough freedom to express their feelings and ideas with their superiors and subordinates.

129 (50%) respondents (belongs to age group 21-30 years) believed that when problems arise people are discussing these problems openly and will try to solve them rather accusing each other behind the back. 129 (50%) respondents (belongs to age group 21-30 years) believed that their seniors are helping them to identify their strength and weakness and are also helping them to solve the mistakes if they made.

51 (20%) respondents (belongs to age group 51-60 years) believed that their respective organisations' top management identifying their potentials and competencies. 129 (50%) respondents (belongs to age group

21-30 years) believed that they are getting sponsorship from their respective organisations for training and development programs, which they should be provided for individual as well as organisational development point of view.

129 (50%) respondents (belongs to age group 21-30 years) believed that they are able to apply the concept called T.E.A.M. (Together Everyone Achieves More) and they get support of each other's strengths & weaknesses. 129 (50%) respondents (belongs to age group 21-30 years) believed that Promotion discuss are based on the contemporary and abilities rather than based on any favoritism. It will damage their working performance individually as well as organisational performances.

129 (50%) respondents (belongs to age group 21-30 years) believed that senior officers from their concern organisations are pointing out in identifying career opportunities available for them. 129 (50%) respondents (belongs to age group 21-30 years) believed that in their respective organisations, Job rotation facilitates employee's development. 51 (20%) respondents (belongs to age group 51-60 years) believed that seniors don't guide their juniors and prepare them for their future responsibilities / roles they are likely to take up in the future.

## CONCLUSION

Employees must be given guidance and suggestions regarding their mistakes in place of punishments. The study reveals that employees expecting support for training programs from Top management, as these training programs will be useful for the development of both Individuals as well as organizations. Employees from each cadre must be provided counseling and mentoring to develop and maintain the TEAM (Together Everyone Achieves More) concept. It is observed that the positive results lead to the age group 21 – 30 years who are most energetic, innovative and believed in the concept TEAM. While the age group 31-40 is less interested in work. It has also found that employees in the 51 – 60 age group and 21 – 30 years mindset and working pattern having major differences.

It has also been observed by the research in this research study based on their cadre even though most of the respondents were belongs to Non Executive category (56%) and Executive category (44%), but the good part of this is most from non executives also knowing about this concepts and working positively in their respective organisations. While considering the education qualification, most of the employees (45%) respondents are below graduate, followed by graduate (38%) and Post Graduate (17%) but still it was observed in most popular and old organisations of Bhavnagar having executives who are just graduate or even some of them are below graduate. This is due to their long relations with the same organisation and their dedicated expert working pattern. In Nutshell, HRD Climate is positive and healthy working environment prevailing in selected OEMs of Bhavnagar District.

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## REAL EARNINGS MANAGEMENT ACROSS FIRM LIFE CYCLE: AN EMPIRICAL ANALYSIS IN THE INDIAN CONTEXT

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### ABSTRACT

The fundamental differences among the Firm Life Cycle stages posit varying ability and motivation of managers to engage in Real Earnings Management (REM). The related literature has dealt with mostly Accrual Earnings Management and captured developed countries. This study aims to examine the behaviour of REM of managers from Firm Life Cycle perspective. The sample of the study consists of all the companies listed on the Bombay Stock Exchange as on 31<sup>st</sup> March, 2019 for ten financial years i.e., 31<sup>st</sup> March, 2010- 31<sup>st</sup> March, 2019. Upon controlling for firm-specific variables, this study finds that firms in Introduction and Decline stage indulge in REM through overproduction and heavy sales discounts. Growth and Mature firms do not indulge in REM significantly. The findings of the study have important implications for investors and policy makers of Indian firms.

**Keywords:** Real Earnings Management, Firm Life Cycle, Earnings Quality

### I. INTRODUCTION

The extensive literature concerning Earnings Management (EM, hereafter) have shown that the earnings quality of a firm and a manager's tendency to distort earnings are found to be associated with many business fundamentals like audit quality (Chi *et al.*, 2011), accounting standards (Zang, 2012), corporate governance (Xie *et al.*, 2003), capital market incentives (Gunny, 2010) and other firm characteristics. These associations are subject to change when moderated by the life cycle stage that a particular firm is at.

A firm's life cycle (FLC, hereafter) consists of various stages which originate from both internal and external factors (Dickinson, 2011). The fundamental differences among the FLC stages posit varying ability and motivation of managers to engage in EM. For example, Introduction and Decline stages of FLC correspond to highly unstable environment which makes EM even more desirable. Therefore, there is a need to study the EM behaviour of managers from FLC perspective.

The literature on EM documents three types of strategies, i.e., Accrual earnings management, Real earnings management (REM, hereafter) and Classification Shifting which managers use to distort earnings. Regarding the examination of EM from FLC dynamics, the related literature has dealt with mostly Accrual EM (Krishnan *et al.*, 2020; Chen *et al.*, 2010; Hastuti *et al.*, 2017). Also, the studies addressing the issue mostly pertain to developed countries.

In view of this, this study aims to determine the impact of FLC on REM in the Indian context. Dickinson's (2011) model is followed to measure FLC stages of the sample companies. The proxies used for REM are abnormal discretionary expenditures, production costs and cash flow from operations (following Roychowdhury, 2006; Cohen *et al.*, 2008; Gunny, 2010). The sample of the study consists

of all the companies listed on the Bombay Stock Exchange as on 31<sup>st</sup> March, 2019 for ten financial years i.e., 31<sup>st</sup> March, 2010- 31<sup>st</sup> March, 2019. The study makes notable contribution in the literature by introducing FLC dynamics in the domain of EM.

### II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Firms do not follow a static pattern and go through multiple phases during their lifetime. They are called FLC stages, viz., Introduction, Growth, Maturity, Shake-out and Decline (Dickinson, 2011). Every FLC stage posits different opportunities and threats in the business environment. How these modalities of FLC stages predicated the managers' outlook towards REM is to be seen next.

The young and rapidly growing firms in the Introduction stage face high risk and uncertainty in the market (Yoo *et al.*, 2019; Jovanovic, 1982). These firms experience low profits and difficulties in meeting expenditures (Hussain *et al.*, 2020). They are characterised by high cost of debt, bankruptcy risk (Akbar *et al.*, 2019) and lower internal controls (Doyle *et al.* 2007). Therefore, as reported by Hussain *et al.* (2020), managers of firms in Introduction stage have greater motives to manage earnings.

As the firms move towards growth stage, they start generating positive cashflows from operating activities and the business environment starts to stabilize (Dickinson, 2011). High sales and profit growth in this stage (Akbar *et al.*, 2019) keeps the managers from wanting to manipulate earnings. Also, these firms attract greater analysts' coverage (Hasan & Habib, 2017).

Upon maturity, firms attain better quality of governance (O'Connor & Byrne, 2015). Although these firms bear pressure to meet earnings benchmarks (Nagar & Radhakrishnan, 2017; Graham *et al.*, 2005), strong internal controls and reduced uncertainty result in containing EM.

As reported by Zadband and Omrani (2014), Maturity firms are associated with highest level of reporting quality.

The performance graph starts to wane in Shake-out and Decline stage. Falling sales volume and profit figures in Decline stage (Hribar and Yehuda, 2015) might make the firms financially distressed. This motivates the managers to resort to EM (Rosner, 2003). Based on this argument, following hypothesis is formulated:

**Hypothesis:** REM is higher during the Introduction and Decline stages of FLC than in Growth and Maturity.

### III. DATA AND METHODOLOGY

#### 3.1 Sample Selection and Data Sources

The sample of the study consists of all the companies listed on the Bombay Stock Exchange as on 31<sup>st</sup> March, 2019 for ten financial years i.e., 31<sup>st</sup> March, 2010 - 31<sup>st</sup> March, 2019. The information was gathered from Prowess, a corporate

database maintained by the Centre for Monitoring the Indian Economy.

Initial sample consists of 47,790 firm-year observations from which all the public sector companies and all the banking and financial companies were deleted. Further, those companies which started trading on BSE after 1<sup>st</sup> April, 2009 and companies which had a change in fiscal-year end during the study period were also eliminated. The requirement of EM estimation models of atleast 10 observations with no missing data in each industry-year group further resulted in deletion of some observations (industries identified on the basis of two-digit NIC classification). Finally, the companies which had missing data required for calculating Dickinson's (2011) life-cycle stages were also deleted. This resulted in final sample of 16,520 observations. Table 1 presents the summary of the sample selection procedure.

**Table 1: Summary of Sample Selection Criteria**

Selection Criteria	Number of Observations
Companies listed on Bombay Stock Exchange as on 31 <sup>st</sup> March, 2019	47,790
Less: Public sector enterprises	640
Banking and Financial sector companies	10,500
Companies with first trading date falling after 1 <sup>st</sup> April, 2009	8,440
Companies with change in fiscal-year end	3,060
Companies with missing data for estimation models	7,278
Companies with insufficient observations per industry-year group	387
Companies with missing data for Dickinson's (2011) life cycle stages	965
Final number of observations	16,520

**Source:** Author's own calculations

#### 3.2 Variable Selection and Description

##### 3.2.1 Independent Variable: Real Earnings Management

Following the studies of Roychowdhury (2006), Cohen *et al.* (2008) and Gunny (2010), the proxies used to measure

$$\begin{aligned} \frac{SG\&A_{it}}{Assets_{it-1}} &= \alpha_0 + \beta_1 \frac{1}{Assets_{it-1}} + \beta_2 \frac{Sales_{it-1}}{Assets_{it-1}} + \varepsilon_{it} \quad (1) \\ \frac{Prod_{it}}{Assets_{it-1}} &= \alpha_0 + \beta_1 \frac{1}{Assets_{it-1}} + \beta_2 \frac{Sales_{it}}{Assets_{it-1}} + \beta_3 \frac{\Delta Sales_{it}}{Assets_{it-1}} + \beta_4 \frac{\Delta Sales_{it-1}}{Assets_{it-1}} + \varepsilon_{it} \quad (2) \\ \frac{CFO_{it}}{Assets_{it-1}} &= \alpha_0 + \beta_1 \frac{1}{Assets_{it-1}} + \beta_2 \frac{Sales_{it}}{Assets_{it-1}} + \beta_3 \frac{\Delta Sales_{it}}{Assets_{it-1}} + \varepsilon_{it} \quad (3) \end{aligned}$$

Where  $SG\&A_{it}$  is the selling, general and administrative expense for firm  $i$  in year  $t$ ;  $Prod_{it}$  is the sum of cost of goods sold in year  $t$  and change in inventory from year  $t-1$  to  $t$ ;  $CFO_{it}$  is cash flow from operations;  $Assets_{it-1}$  is the total assets in year  $t-1$ ;  $\Delta Sales_{it}$  is the change in revenues for firm  $i$  from year  $t-1$  to  $t$ . These models (equation 1-3) are estimated cross-sectionally for every industry-year with at least 10 observations.

Following the prior literature on REM (Cohen & Zarowin, 2010; Zang, 2012),  $Abn\_SG\&A$  and  $Abn\_CFO$  are multiplied by minus one, so that higher the amount of these residuals, more likely the firm's engagement in EM. Also,

REM are abnormal discretionary expenditures ( $Abn\_SG\&A$ ), abnormal production costs ( $Abn\_Prod$ ) and abnormal cash flow from operations ( $Abn\_CFO$ ). These proxies are calculated as residuals of the following regressions:

consistent with Cohen *et al.* (2008), Zang (2012), Chi *et al.* (2011), Doukakis (2014), a comprehensive measure of EM by real activities is also developed ( $REM\_I$ ) by combining the three individual measures of REM. So,  $REM\_I$  is the sum of all the three measures ( $-Abn\_SG\&A + Abn\_Prod - Abn\_CFO$ ).

##### 3.2.2 Independent Variable: Firm's Life Cycle

Following Dickinson (2011), cash flow patterns are used as indicators of FLC stage. Table 2 shows the mapping of life cycle stages corresponding to different combinations of cash flow activities. There are five stages of FLC: Introduction, Growth, Maturity, Shakeout and Decline.

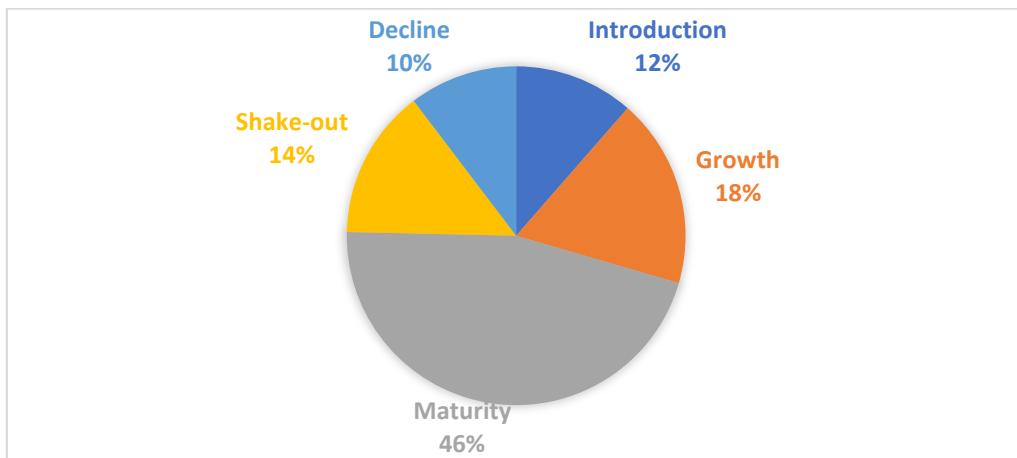
**Table 2: Dickinson's (2011) Model of FLC Classification**

Cash Flows	Introduction	Growth	Mature	Decline	Shake-out
Operating	-	+	+	-	Any other combination
Investing	-	-	-	+	
Financing	+	+	-	+/-	

Source: Dickinson (2011)

Figure 1 shows the distribution of sample firm-years into different FLC stages on the basis of Dickinson's (2011) model. Almost half of the sample firm-years fall in

Maturity Stage. Remaining sample is almost equally divided in the other four stages, Decline being the lowest.



**Figure 1: Classification of Sample firm-years in FLC Stages**

Dummy variables are introduced for all the FLC stages, which all other stages will be analysed. Table 3 provides a except Shake-out. Shake-out stage is the benchmark against detailed description of all the variables.

**Table 3: Variable Selection and Description**

Sr. No.	Symbol Used	Definition	Source
<b>I. Dependent Variable (Real Earnings Management)</b>			
1.	<i>Abn_SG&amp;A</i>	Residuals of regression equation (1)	Author's own calculations
2.	<i>Abn_Prod</i>	Residuals of regression equation (2)	
3.	<i>Abn_CFO</i>	Residuals of regression equation (3)	
<b>II. Independent Variables (Firm's Life Cycle Stage)</b>			
1.	<i>Intro</i>	Dummy variable, 1 if the firm-year falls in Introduction stage of Dickinson (2011) model, 0 otherwise	Author's own calculations
2.	<i>Growth</i>	Dummy variable, 1 if the firm-year falls in Growth stage of Dickinson (2011) model, 0 otherwise	
3.	<i>Maturity</i>	Dummy variable, 1 if the firm-year falls in Maturity stage of Dickinson (2011) model, 0 otherwise	
4.	<i>Decline</i>	Dummy variable, 1 if the firm-year falls in Decline stage of Dickinson (2011) model, 0 otherwise	
<b>III. Control Variables</b>			
1.	<i>ROA</i>	Ratio of Net Income divided by Total Assets	Prowess
2.	<i>logTA</i>	Natural logarithm of Total Assets	
3.	<i>PB</i>	Firm's price to book ratio	
4.	<i>LEV</i>	Ratio of Total Liabilities divided by Total Assets	

Source: Author's own compilation

#### IV. DATA ANALYSIS

To test the hypothesis, following regression equation was employed:

$$REM_{it} = \alpha_0 + \beta_1 Intro_{it} + \beta_2 Growth_{it} + \beta_3 Maturity_{it} + \beta_4 Decline_{it} + \beta_5 ROA_{it} + \beta_6 LogTA_{it} + \beta_7 PB_{it} + \beta_8 LEV_{it} + \varepsilon_{it} \quad (4)$$

Where,

**Dependent variable** =  $REM_{it}$ , which takes value of all REM proxies ( $Abn\_SG\&A$ ,  $Abn\_Prod$ ,  $Abn\_CFO$  and  $REM\_I$ ) sequentially

**Independent Variables** = Dummy Variables for FLC stages (Introduction, Growth, Maturity, Shakeout and Decline), which takes value 1 if the firm-year belongs to respective stage, 0 otherwise

**Control Variables** = *ROA*, *LogTA*, *PB*, *LEV*

The association between FLC and REM has been analysed through panel data regression model. The model controls for year fixed effects. Given the large size and diverse industry affiliation of the sample, influence of potential outliers needs to be mitigated. So, following the literature, all the continuous variables are winsorized year-wise at their respective 1<sup>st</sup> and 99<sup>th</sup> percentiles. Additionally, to

control for within-firm correlations in errors (Zang, 2012; Chi et al., 2011; Doukakis, 2014; Prawitt *et al.*, 2009; Gunny, 2010), test statistics are based on robust standard errors (clustered at firm-level).

#### Descriptive Statistics

Table 4 provides the descriptive summary of the continuous variables of the study. Means of all the REM proxies are negative, *Abn\_SG&A* being the highest negative at -0.15. The standard deviation ranges from 0.31 to as high as 1.95. Among the control variables, *LogTA* takes the highest value of 7.72, followed by *ROA* at 2.43. However, *ROA* has the highest standard deviation of 8.92.

**Table 4: Descriptive Statistics**

Variable	Mean	Std. Dev.	Min	Max
<i>Abn_SGA</i>	-0.1513	1.7679	-14.0110	31.0677
<i>Abn_Prod</i>	-0.0089	0.3603	-2.9725	2.4359
<i>Abn_CFO</i>	-0.0013	0.3084	-2.3326	2.1698
<i>REM_I</i>	-0.1453	1.9490	-14.2793	31.0650
<i>ROA</i>	2.4316	8.9205	-51.9	28.7
<i>LogTA</i>	7.7229	1.9126	3.6	13.2336
<i>PB</i>	1.8744	3.0778	-6.2338	24.12
<i>LEV</i>	0.5638	0.3444	0.0367	3.1921

**Source:** Author's calculations

#### Correlation Analysis

Table 5 reports pairwise correlation between all the variables of the study. REM proxies have a significantly positive correlation with each other, except *Abn\_SG&A* and *Abn\_CFO* which have a significantly negative correlation. *Intro* and *Decline* show a significantly positive correlation with all the REM proxies, whereas *Maturity* has significantly negative correlation with them. Correlation between *Growth* and REM proxies is not significant. These results are in line with the hypothesis of the study that the firms in Introduction and Decline stages are more likely to engage in REM. Among the control variables, all of them have a significant and negative correlation with the REM proxies, except *LEV* which has a positive correlation.

#### V. RESULTS AND DISCUSSION

The results of the panel data regression used to test the association between FLC and REM, while controlling for firm-specific variables, are presented in Table 6. For the first model, i.e., with *Abn\_SG&A* as dependent variable, *Intro* and *Growth* have positive coefficients whereas *Maturity* and *Decline* have negative coefficients. However, none of the stages enter the equation significantly. For *Abn\_Prod* as dependent variable, *Intro* ( $\beta = 0.07$ ,  $t = 5.70$ ) and

**Table 5: Pairwise Correlation**

Variables	<i>Abn_SGA</i>	<i>Abn_Prod</i>	<i>Abn_CFO</i>	<i>REM_I</i>	<i>Intro</i>	<i>Growth</i>	<i>Maturity</i>	<i>Decline</i>	<i>ROA</i>	<i>LogTA</i>	<i>PB</i>	<i>LEV</i>
<i>Abn_SGA</i>	1.000											
<i>Abn_Prod</i>	0.024***	1.000										
<i>Abn_CFO</i>	-0.021***	0.267***	1.000									
<i>REM_I</i>	0.925***	0.280***	0.215***	1.000								
<i>Intro</i>	0.015**	0.073***	0.183***	0.059***	1.000							
<i>Growth</i>	-0.003	0.001	-0.013*	-0.004	-0.169***	1.000						
<i>Maturity</i>	-0.024***	-0.066***	-0.149***	-0.059***	-0.331***	-0.432***	1.000					
<i>Decline</i>	0.021***	0.035***	0.124***	0.046***	-0.122***	-0.160***	-0.312***	1.000				
<i>ROA</i>	-0.066***	-0.097***	-0.058***	-0.086***	-0.103***	0.077***	0.212***	-0.211***	1.000			
<i>LogTA</i>	-0.096***	-0.023***	-0.018**	-0.098***	-0.073***	0.055***	0.099***	-0.136***	0.194***	1.000		
<i>PB</i>	-0.046***	-0.039***	-0.025***	-0.053***	-0.019**	-0.004	0.066***	-0.057***	0.262***	0.163***	1.000	
<i>LEV</i>	0.006	0.055***	0.010	0.015**	0.055***	-0.019**	-0.065***	0.011	-0.480***	-0.008	-0.104***	1.000

\*\*\*  $p<0.01$ , \*\*  $p<0.05$ , \*  $p<0.1$

*Decline* ( $\beta = 0.03$ ,  $t = 2.39$ ) show significantly positive coefficients at 1 and 5 percent respectively. The other two stages do not show significant coefficients. For *Abn\_CFO* as dependent variable, *Intro* ( $\beta = 0.19$ ,  $t = 18.30$ ), *Growth* ( $\beta = 0.03$ ,  $t = 3.01$ ) and *Decline* ( $\beta = 0.15$ ,  $t = 13.56$ ) have positive coefficients significant at 1 percent while *Maturity* shows a negative coefficient ( $\beta = -0.01$ ,  $t = -2.02$ ) significant at 5 percent. The overall REM proxy, *REM\_1*,

replicates the results of *Abn\_Prod*. Positive coefficients are reported for *Intro* ( $\beta = 0.32$ ,  $t = 4.41$ ) and *Decline* ( $\beta = 0.18$ ,  $t = 3.23$ ), significant at 1 percent. Among the control variables, *ROA* has negative coefficients in all the models and they are significant in three of the REM proxies. *LogTA* is also significant for three proxies but shows mixed signs in the models. *PB* and *LEV* do not enter the equations significantly, except for *REM\_1*.

**Table 6: Regression Results: Impact of Firm Life Cycle on REM**

	<i>Abn_SG&amp;A</i>	<i>Abn_Prod</i>	<i>Abn_CFO</i>	<i>REM_1</i>
<b><i>Intro</i></b>	0.0387 (0.59)	0.0735*** (5.70)	0.193*** (18.30)	0.322*** (4.41)
<b><i>Growth</i></b>	0.0339 (0.64)	0.0141 (1.36)	0.0254*** (3.01)	0.0775 (1.30)
<b><i>Maturity</i></b>	-0.0032 (-0.08)	-0.0091 (-0.97)	-0.0148** (-2.02)	-0.0271 (-0.61)
<b><i>Decline</i></b>	-0.0018 (-0.04)	0.0303** (2.39)	0.149*** (13.56)	0.184*** (3.23)
<b><i>ROA</i></b>	-0.0108*** (-5.38)	-0.0030*** (-4.58)	-0.0003 (-0.81)	-0.0138*** (-5.54)
<b><i>LogTA</i></b>	-0.0764*** (-6.02)	0.0005 (0.21)	0.0035* (1.92)	-0.0765*** (-5.23)
<b><i>PB</i></b>	-0.0101 (-1.63)	-0.0019 (-1.11)	-0.0011 (-1.08)	-0.0128* (-1.70)
<b><i>LEV</i></b>	-0.105** (-2.10)	0.0166 (1.37)	-0.0079 (-0.81)	-0.105* (-1.79)
<b><i>Constant</i></b>	0.534*** (5.13)	-0.0215 (-1.08)	-0.0566*** (-3.50)	0.505*** (4.24)
<b>Adjusted R-squared</b>	0.020	0.015	0.059	0.023
<b>F</b>	9.996	16.87	95.53	16.61

4. \* $p<0.10$ , \*\* $p<0.05$ , \*\*\* $p<0.01$

Source: Author's Calculations

## Discussion

The results of the panel data regression models assessing the impact of FLC on REM show that the hypothesis of likelihood of *Intro* and *Decline* firm-years engaging in REM is partially supported by the study. The results do not find significance of any of the stages in case of *Abn\_SGA*. However, *Intro* and *Decline* stage firm-years have significant and positive coefficients in case of *Abn\_Prod* and *Abn\_CFO*, indicative of greater likelihood of such firm-years to indulge in overproduction to reduce cost of goods sold and give heavy sales discounts to achieve targeted sales (similar to Hasan & Habib, 2017; Hussain *et al.*, 2020). *Growth* and *Maturity* firm-years indulge in REM through none of the activities but *Abn\_CFO*, with a positive and a negative coefficient respectively. It shows less involvement of managers of such firms in REM (similar to Nagar & Radhakrishnan, 2017; Hussain *et al.*, 2020). The overall REM proxy, *REM\_1* shows significance of *Intro* and *Decline* firm-years only, thus upholding the hypothesis of the study.

## CONCLUSION

This study aimed at examining the impact of FLC stages on REM practices of all the companies listed on BSE for ten financial years i.e., 31<sup>st</sup> March, 2010 – 31<sup>st</sup> March, 2019 using panel data analysis on 16,520 firm-year observations. FLC is measured using Dickinson's (2011) model. The proxies used for REM are abnormal discretionary expenditures, production costs and cash flow from operations (following Roychowdhury, 2006; Cohen *et al.*, 2008; Gunny, 2010).

Upon controlling for firm-specific variables, this study, consistent with the proposition, finds that firms in Introduction and Decline stage indulge in REM through overproduction and heavy sales discounts. Growth and Maturity firms do not indulge in REM significantly. However, no firm in any of the stages cut discretionary expenditures to manipulate earnings.

The findings of the study have important implications for investors and policy makers of Indian firms. The investors should interpret the financial statement of Introduction and

Decline firms with caution as such firms have high tendency of manipulating real activities. The regulators should adopt measures to restrict such endeavours and ensure fair reporting practices.

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## EVALUATING WORKFORCE EXPECTATIONS AND SATISFACTION WITH TRAINING PRACTICES OF PUNJAB TOURISM INDUSTRY

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### ABSTRACT

*Training plays a significant role in the tourism industry where quality is the most important characteristic creating uniqueness in an organisation. The present study is based on public sector organisation. The study emphasis the importance of workforce expectations and satisfaction from training. The purpose of this research is to analyze the gap between workforce expectations and satisfaction in Punjab tourism industry. Paired t-test was applied. Results of paired T-test showed that workforce expectations were met. This study suggests more understanding of the importance of workforce expectations and satisfaction from training and its consequences on workforce training practices in Punjab tourism industry.*

**KEYWORDS:** *Tourism Industry, Workforce Training, Training Expectations, Training Satisfaction*

### 1. INTRODUCTION

Training is significant in the tourism industry which is people oriented. Training is found to be significantly linked with trainees' expectations and satisfaction. The aim of training programs is consequently to enhance the business performance of organizations, thus the effectiveness of a training program can be conceptualized as training acquisition and transfer of training. Tourism industry has become one of the fastest growing industries in the recent years. Training in the tourism industry is always in need of improvement. The training organizers need to know what workforce expects from training, and how the tourism training practice is perceived in order to improve the training program. This study attempted to gain insights into workforce expectations and satisfaction about training practices. The objectives were to investigate any discrepancies between workforce expectations and satisfaction and to explore the factors affecting expectation and satisfaction. No empirical research has been conducted on the evaluation of training practices of Punjab Tourism yet. This lack of research, along with the attention given to the concept of training in the tourism industry, was the driving force for this study.

### OVERVIEW OF PHTPB AND DOT:

The Punjab Heritage & Tourism Promotion Board (PHTPB) was set up in 2002. The board along with DOT organizes the training sessions for workforces. Directorate of Tourism (DOT) plays as a facilitator, coordinator and regulator in the expansion of private sector in the state of Punjab and also provides information to the tourists.

### 2. REVIEW OF LITERATURE

Before attending a training session, workforce has certain expectations regarding training in their minds. Training satisfaction exerts a cardinal impact on job satisfaction,

further training satisfaction and job satisfaction also affected the confidence of career. The training expectations and satisfaction depends on various factors like trainer, training content, training objectives, training infrastructure and training feedback. There is a strong correlation between training and other factors including increased employee job satisfaction and length of employment (Conrade and Woods, 1994). Trainer's main objective is to transfer his knowledge and skills to the trainees which involves identifying training courses, choosing appropriate training methods, evaluation of training activities, and helping the trainee to transfer training at the work place (Singh and Banerjee, 2005). It becomes necessary to understand the impact that Training Content on trainees' attitudes. Management can alter employees' perceptions of training programs through the information that they provide to organizational members regarding the content of a training session. (Holladay *et al* 2008). Moreover, training methods are means of attaining desired objectives set for a training program. In practice, a variety of training methods are employed for achieving these objectives. Hence, organisation needs to select a method or mix of methods to meet its training needs. The choice of training methods would depend on a variety of factors, such as purpose of training, nature of contents, relevance to the participants, level of trainees, competence of trainers/ instructors, cost, etc. Training Feedback provides the clear picture of what weaknesses are there on the employees' end those immensely need the training. Both training and feedback can collectively bring sharpness in quality of processes performed by the employees. (Farooq & Khan 2011).

### 3. RESEARCH METHODOLOGY

**SCALE:** Existing review of literature regarding various aspects of tourism workforce' expectations and satisfaction about training was considered and accordingly statements were formed related to the expectations and satisfaction of

workforce. Five-point Likert scale as used by Schmidt (2007), Costa (2006) and Holton (2000) was followed and modified to measure workforce expectations and satisfaction. The minimum required sample size of 117 was calculated using Taro Yamane's (1973) formula from the total population of 300. The primary data was collected through stratified random sampling technique from workforces who underwent training programs organised by DOT and PHTPB.

**SAMPLE PROFILE:** The respondents from Punjab Tourism Industry included maximum workforces from the department of PHTPB and DOT who were Tourist Officer, Senior Scale Stenographer, Steno Typist (Sr.), Tourist Guide, Office Assistant, Accounts Assistant, Community Development Officer, Architectural Draftsman, Visitor Service Associate, Assistant Manager IT, Environment Safeguard Specialist, Senior Assistant, Social Mobilizer, Steno Typist (Jr.) respectively.

#### 4. DATA ANALYSIS AND FINDINGS

##### EXPLORATORY FACTOR ANALYSIS (EFA) AND MEASUREMENT MODEL

The data was analysed with exploratory factor analysis (EFA) by adopting principal component analysis and

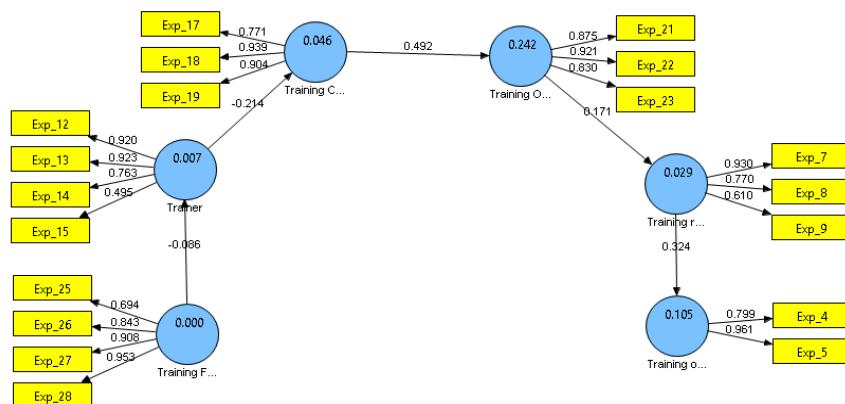


Figure 1: Measurement model of Workforce' Expectations and Satisfaction

Table 1 exhibits the factor loadings of confirmatory model. These loadings are similar to the factor loadings shown in table 1. But CFA being a constrained model, therefore there may be variation in the factor loadings. But as it can be seen that majority of the factor loadings are above 0.7

varimax rotation method (Hair, Jr, et al.,2010) Bartlett's test of Sphericity ( $p<0.01$ ) and Kaiser–Meyer–Olkin ( $KMO=0.727$ ) were used to examine the sampling adequacy (Field, 2009). In the model, six factors were identified using principal component matrix with an eigenvalue equal to or greater than 1 that explained 77.090 per cent variance (Kaiser, 1960). Variation rotation technique was used to rotate the extracted factors. Six factors were determined and 19 items were retained. These factors were labelled as training feedback (factor loading 0.910 to 0.785), trainer (factor loading 0.893 to 0.772), training content (factor loading 0.902 to 0.769), training outcome (factor loading 0.884 to 0.764), training relevance (factor loading 0.813 to 0.762), and training objectives (factor loading 0.869 to 0.851). Finally, only these six factors were selected which had an eigenvalue equal to or larger than 1.0 whereas items with factor loading greater than 4.0 were retained; no cross-loadings were observed (Nunnally, 1978). The factor loadings are like correlations between a factor and its measurements. Higher the loading, more important is a measurement of the construct.

suggesting that more than 50% of the variance/information in the observed variable has been explained by the underlying construct or factor. This is a sign of the high level of convergent validity of the constructs (refer table 2).

Table 1  
 Factor loadings of measurement model

Variable	Trainer	Training Content	Training Feedback	Training Outcome	Training objectives	Training relevance
Exp_12	0.9201					
Exp_13	0.9229					
Exp_14	0.7633					
Exp_15	<b>0.4953</b>					
Exp_17		0.7713				
Exp_18		0.9394				
Exp_19		0.9039				
Exp_21				0.8752		
Exp_22					0.9209	
Exp_23					0.8298	

Exp_25			0.6943							
Exp_26			0.8432							
Exp_27			0.9076							
Exp_28			0.9526							
Exp_4							0.7988			
Exp_5							0.9609			
Exp_7									0.9304	
Exp_8									0.7702	
Exp_9										0.6103

The convergent and discriminant validity of the model was measured. Convergent validity was tested using the average variance extracted (AVE), Cronbach's alpha, and composite reliability (CR). All the standardized loadings of the constructs were more than the prescribed limit of 0.50. The values of CR were higher than the limit of 0.70 (Fornell-Larker, 1981). Using Cronbach's alpha, the reliability of the constructs was measured which ranged

from 0.724 (training relevance) to 0.904 (training feedback). That showed the good reliability of the constructs. Discriminant validity (Table 1) was assessed through AVE for each latent variable included in the model which should be greater than the inter-construct correlation estimate (Fornell&Larcker, 1981). The data given in the Table 1 tells the fulfillment of the requirements.

**Table 2**  
**Reliability, Validity and Correlation among constructs**

Constructs	AVE	Range of standardized loadings	CR	Cronbachs Alpha	T	TC	TF	TO	TO	TR
Trainer	0.6316	0.893 - 0.772	0.8672	0.8733	<b>0.795</b>					
Training Content	0.7648	0.902 - 0.769	0.9064	0.8513	-0.214	<b>0.875</b>				
Training Feedback	0.731	0.910 - 0.785	0.9147	0.9048	-0.086	0.189	<b>0.855</b>			
Training Outcome	0.7675	0.884 - 0.764	0.9081	0.8509	-0.170	0.492	0.272	<b>0.876</b>		
Training objectives	0.7807	0.869 - 0.851	0.8759	0.7507	-0.196	0.254	0.093	0.212	<b>0.884</b>	
Training relevance	0.6104	0.813 - 0.762	0.8204	0.724	0.033	0.022	0.204	0.171	0.324	<b>0.781</b>

**Source: Authors.**

#### NOTES:

1. Notes: T= Trainer, TC= Training Content, TF= Training Feedback, TO=Training Outcome, TO= Training Outcome, TR= Training relevance.
2. SD=Standard deviation, CR=composite reliability, AVE=Average variance extracted
3. Off-diagonal values were inter-construct correlations and on-diagonal values were AVEs.
4. All correlations were significant at p <0.01.

#### EVALUATION OF THE WORKFORCE' EXPECTATIONS AND SATISFACTION ABOUT THE TRAINING IMPARTED TO THEM

The sample respondents were analyzed for their expectation and satisfaction about the Training factors. In order to know whether there was a significant difference between expectation and satisfaction of employees of Tourism industry, paired sample t-test was applied on workforce of Punjab tourism industry.

*Ho: There is no significant difference between the workforce training expectations and satisfaction Punjab.*

*H1: There is a significant difference between the workforce training expectations and satisfaction Punjab.*

The average expectation from the trainer from the respondents of Punjab was 3.9600 and the average

satisfaction was 4.0100. The difference in expectation and satisfaction from the trainer (-.05000) was found to be insignificant as T= -.573, p=.569, suggesting that expectations from trainer of respondents from Punjab were met. Similarly, the average expectation from the training content from the respondents of Punjab was 3.8467 and the average satisfaction was 3.9267. The difference in expectation and satisfaction from the training content (-.08000) was again found to be insignificant as T= -.768, p=.446, suggesting that expectations from training content of respondents from Punjab were again met. Also, the average expectation from the training outcome from the respondents of Punjab was 3.8467 and the average satisfaction was 3.8467. The difference in expectation and satisfaction from the training outcome (0.00000) was again found to be insignificant as T= 0.000, p=1.000, suggesting that expectations from training outcome of respondents from Punjab were met. Likewise, the average expectation from the training feedback from the respondents of Punjab was 3.9850 and the average satisfaction was 3.9850. The difference in expectation and satisfaction from the training feedback (0.00000) was again found to be insignificant as T= 0.000, p=1.000, suggesting that expectations from training feedback of respondents from Punjab were met. Again, the average expectation from the training relevance from the respondents of Punjab was 3.8067 and the average satisfaction was 3.8333. The

difference in expectation and satisfaction from the training relevance (-.02667) was again found to be insignificant as  $T = -.317$ ,  $p=.752$ , suggesting that expectations from training relevance of respondents from Punjab were met. Also, the average expectation from the training objectives from the respondents of Punjab was 3.8200 and the average satisfaction was 3.8100. The difference in expectation and satisfaction from the training objectives (.01000) was again

found to be insignificant as  $T = .101$ ,  $p=.920$ , suggesting that expectations from training objectives of respondents from Punjab were met. The expectations of respondents from Punjab were met for all the constructs (expectation from trainer, training content, training outcome, training feedback, training relevance and training objectives) as t-test was insignificant for all of them.

**Table 3**  
**Evaluation of the Workforce' Expectations and Satisfaction about the Training imparted to them (paired sample t-test)**

<b>Punjab</b>		<b>Mean</b>	<b>N</b>	<b>Std. Deviation</b>	<b>Std. Error Mean</b>	<b>Mean Diff</b>	<b>Std dev. Diff</b>	<b>T</b>	<b>df</b>	<b>Sig.</b>
Pair 1	Expectations from trainer	3.9600	50	.57446	.08124	-.05000	.61652	-.573	49	.569
	Satisfaction from trainer	4.0100	50	.55549	.07856					
Pair 2	Expectations from training content	3.8467	50	.61798	.08740	-.08000	.73636	-.768	49	.446
	Satisfaction from training content	3.9267	50	.55242	.07812					
Pair 3	Expectations from training outcome	3.8467	50	.61060	.08635	0.00000	.66326	0.000	49	1.000
	Satisfaction from training outcome	3.8467	50	.58403	.08259					
Pair 4	Expectations from training feedback	3.9850	50	.50611	.07157	0.00000	.63084	0.000	49	1.000
	Satisfaction from training feedback	3.9850	50	.53788	.07607					
Pair 5	Expectations from training relevance	3.8067	50	.53913	.07624	-.02667	.59415	-.317	49	.752
	Satisfaction from training relevance	3.8333	50	.55635	.07868					
Pair 6	Expectations from training objectives	3.8200	50	.67582	.09558	.01000	.70342	.101	49	.920
	Satisfaction from training objectives	3.8100	50	.84449	.11943					
	Satisfaction from training objectives	3.7700	263	.69302	.04273					

The above section evaluated the Workforce' Expectations and Satisfaction about the Training imparted to them. The analysis revealed that the expectations of respondents of the state of Punjab were completely met.

## 5. PRACTICAL IMPLICATIONS AND RECOMMENDATIONS

There is no gap found between expectation and satisfaction level of workforce, indicating that quality trainings are organised by the department. Somehow the expectations of workforce might be low regarding various training factors analyzed in the study. This is of concern for human resource practitioners who need to study the factors effecting workforce expectations and satisfaction towards training session and to determine how training programmes can be adapted to the needs of industry. This will directly impact the sustainability of the Punjab tourism industry and assist in improving the quality of tourism services in this state.

## CONCLUSION

This study compared the workforce expectations and satisfaction from training program of in Punjab tourism Industry by studying the factors affecting the expectation

and satisfaction level of workforce. The importance of these factors has been highlighted in the literature. This study revealed that no gaps exist between the workforce expectations and satisfaction from training programmes and there is no effect of demographic factors on training expectations and satisfaction of workforce. The results revealed that expectations of the workforce are fulfilled, resulting in satisfaction from the training which further influences the growth of the tourism industry. This research indicated that, still human resource practitioners in the Punjab tourism industry should aim at provide trainings in emerging tourism trends. This will not only upgrade the skill graph of workforce but also the productivity graph of the department because of the unique reason that trained workforce is the key to success for any organisation.

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## ATTRIBUTES OF BUYING BEHAVIOUR FOR FASHION APPAREL: AN EXPLORATORY STUDY

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### ABSTRACT

*In this paper an attempt has been made to identify the factors affecting buying behaviour of the consumers for fashion apparel in select tier-II cities of north India. With intent to achieve the objective of measuring buying behaviour of women, exploratory factor analysis has been used. Before undertaking the analysis, a pilot study was done followed by exploratory factor analysis. Data was collected from 300 women respondents from two cities of Lucknow and Chandigarh, representing generation X and Y, selected for conducting the present study. Exploratory Factor Analysis was employed for analysis. The study concludes that consumer characteristics being the crucial attribute that influences buying behaviour of women consumers followed by external factors , product attribute and store characteristics.*

**Keywords:** *Fashion, Buying Behaviour, Consumer Characteristics, External Factors.*

### INTRODUCTION

Fashion, in its embracing form, is a universal social institution that builds a man as a whole. Fashion is a universal principle in any civilization. It influences and modifies the human body and all modes of its expression (Al-Halah, 2017).

Apparel is considered to be an immense necessity of human beings like food and shelter. Apparel plays a significant role in social and cultural functions. Modern researchers believe that apparel is a measure of identification and a nonverbal mode of communication. There is scarcely any arena of human activity in which values and lifestyles are reflected more deeply than in clothes one chooses to wear (Horn & Gurel, 1985; Rajput, 2012). Those people who desire to rise beyond the average get a satisfactory outlet of their recognized apparel. By the apparel decisions, an individual reveals the credence about oneself that he/she wants to represent about themselves. The values that are reflected in apparel are related to specific clothing interests, choices, and behaviour in the selection and use of apparel. Researches show that our general values affect our specific apparel decisions/choices. According to Taylor and Cosenza (2002), if the aesthetic benefits are high, then the apparel will be picked for its attractiveness of line, beauty in fabric, or personally satisfying dress. If the economic values are high, apparel purchases may reveal the utility, quality, and price as most important; or the clothes selected may make a judgment of the financial statement (Dillon et al., 1993).

### LITERATURE REVIEW

#### *Fashion apparel- a self-expression measure*

Fashion apparel enlightens the personality and self-esteem of an individual, so the fashion outfits are used and mainly

consumed by the public to enhance one's characteristics (Miller-Spillman, 2005). Dimensions such as fashion awareness, individual orientation, the orientation of state, opinion of style leadership, price orientation, and purchasing habits must be taken into account when we talk about the consumption of fashion apparel. Therefore, the purchase involves many dimensions and choices of consumers participate mostly in the purchase process. (Seo, Hathcote & Sweeney 2001).

#### *India and Fashion*

Statistics in fashion apparel have gained outstanding or noteworthy attention among the people of India and abroad (Bakewell, Mitchell & Rothwell, 2006). McKinsey and Company have estimated a significant growth in the global fashion industry in 2019. Growth is projected to be between 3.5% and 4.5%, marginally below the 2018 rate (Handa & Khare, 2013). In India, one of the largest industries is apparel and textiles, with a CAGR of 13.58% and is anticipated to reach \$250 billion by 2019 from \$150 billion in July 2017. It shares 14% to industrial production and 4% to GDP of the country. It has been one of the nation's main sources of jobs for more than 45 million people (Indian Brand Equity Foundation Report, 2017-18). *Role of Gender in Fashion*

In the prevailing scenario, the decision-making process is hugely stimulated by the gender divergence in generations. Men and women have unique measurements regarding the components of the products that they plan to purchase (Banyte, Paunksniene, & Rutelione, 2007). Past researches suggest that gender exposure has a moderate effect on the purchase decisions of consumers. Men and women have different resolutions, and state of mind for apparels and diverse characteristics of the attires sway their purchase choices. Women are most fascinated by apparel and deeply involved in fashion apparel as compared to men (McCraken

& Roth, 1989). The social turn of mind amongst men and women also creates behavioral contrasts and effects choices. Shopping, for women, is fun and enjoyments which includes friends and family and is of higher significance in comparison with men (Ogletree et al., 1990). Women are quite sensible and aware of the forms than their partners and show enormous investment in the purchase of apparel (Handa & Khare, 2013). They are also deeply involved in exploring product information and spend time in different stores of the product to analyze before making a final purchase decision.

### **Characteristics of Fashion**

Past researches in the fashion context have gone through the concepts of "self-congruity" (Das, 2015); "co-branding" (Wu & Chalip, 2014); "collective self-esteem"; "interpersonal influence" (Handa & Khare, 2013), "brand personality" and "word of mouth" (Ismail & Spinelli, 2012) and "cosmopolitanism in fashion apparel involvement" (Khare, 2014). However, not a single in the above studies have gone through the impact of different characteristics or factors on the buying behavior of the consumers for the fashion apparel status. The current study has shortlisted various factors to study the buying behavior of women for fashion apparel. These characteristics/ factors are illustrated below:

#### **Product characteristics**

Product characteristics can be defined as the building blocks of the product prospectus that describes the features or characteristics of the given product. Product characteristics are the features like price; quality; design; style. These characteristics can be tangible or intangible. Hence, product characteristics are the basis on which the customers' build up a purchase decision. A consumer may compare the characteristics of the product against their needs and wants and then make the selection of the product according to what matches of her needs and wants (Michaelidou & Dibb, 2006). Product characteristics include length, breadth, consistency, size, style, packaging, function, etc. that affect consumer purchase behavior.

Kwan et al. (2004) identified five factors in clothing choice criteria viz. "named product and self-image related criteria"; "style and quality related criteria"; "durability and natural care"; "fit and sex appropriateness"; and "price". Beaudoin et al. (2000) identified twelve variables that affect the purchase decision of consumer viz: good fit, price, durability, comfort, color, fashion, the stability of occasion, brand, easy care, attractiveness and choices of style.

#### **Store Characteristics**

Store Characteristics include store atmosphere and amenities, store-provided services, store format, etc. that impact customer clothing buying behaviour (Gurunathan, 2013). Retail outlets play a significant part in affecting both store and manufacturer brand's customers. The characteristics such as the design

and layout of the store, the exchange scheme, and reimbursement, the company's reputation, staff co-operation, etc., were also equally important for the customers (Birtwistle & Freathy 1998). Many past studies have recognized a variant bunch of store characteristics. A lot of such elements have been discovered and calculated by many researchers. Besides, to determine the store features, past researches have tended to understand the magnitude to which such characteristics can affect the choice in store of the customer. Bearden (1977) stated that the "atmosphere", "locality", "parking", and "friendly nature" of people and sales executive affected the choice of store for the customer. *External Factors*

For information collection, consumers make use of social and informal resources. This phenomenon of consumers, seeking information regarding products and services was realized to be an essential aspect of consumers' behavior (Zaltman, 1965). Therefore, the widely observed consumer behavior is known as social communication, opinion seeking, or buzz. One of the significant issues in the information seeking literature is the deficiency of a consistent definition of what behaviors the consumer information research constitutes. Past studies highlight the variants of informational sources from which information was looked for (retailers, kinds of advertisements, interpersonal sources), the amount and variety of information gathered, time parameter in seeking the information, the number of brands for which information was sought and how information was sought (Engel et al., 1968). This aspect of the current research is evaluated by the impact of family and friends, past experience, the Internet, and TV/Magazines.

#### **Consumer Characteristics**

The consumer characteristics approach appeared to be effective and as it centered mostly on the psychological inclination of customers in decision-making. These are consumer traits such as engagement, fashion and brand awareness, loyalty, sentiments, which vary from customer to customer and have an impact on the purchasing behaviour of apparel. In the present research, this dimension is evaluated in terms of "fashion consciousness", "store image", "impulsive buying behaviour", "frequent shoppers", "brand loyalty", and "preference to try to buy before purchase".

In literature, two types of influences on consumer, namely: external and internal influences. External influences on consumer behaviour comprise demographics, economic, social, situational, and technical factors. Internal factors, like attitudes and beliefs, learning, motivations and needs, personality, are involved. While external factors have a significant impact on the actions of consumers, internal factors are no less important (Keegan et al., 1992).

#### **OBJECTIVES OF THE STUDY**

- To identify the attributes that affects that buying behaviour of the consumers.

## RESEARCH METHODOLOGY

In this study for the purpose of data collection, questionnaire method was used. A sample of 300 women was collected. The sample includes generation X and generation Y. Age group considered for the study was 22-49. Geographical area considered for the study was tier II cities of north India. These two cities are Lucknow and Chandigarh. For the analysis of data, exploratory factor analysis was used to explore the factors/attributes of buying behaviour from the sample. Before applying factor analysis, reliability test was applied on the instrument. Overall reliability value (Cronbach Alpha) of the questionnaire is 0.883 which is greater than the acceptable limit.

## ANALYSIS AND FINDINGS

The sample comprised of two age groups i.e. 22-36 (Gen Y) and 37-49 (Gen X). 53.7 % of the samples were in the age group of 22-36 years, and 46.3% in the age group of 37-49 years. The sample comprised of respondents from different job-profile such as self-employed/business 17.3%, paid employment 33.7%, homemaker 20%, and student 29%. 38.7% of the respondents were single and 61.3% of the respondents were married. The sample was also separated with respect to education: 1.7% had a senior secondary level, 21.7% were undergraduate, 56% were postgraduate and 20.7% had a doctoral degree. In relations to income, a maximum number of respondents (34.7%) lies in the category of 50001-100000 followed by more than 200001 (25.3%), 100001-200000 (23.3%) and less than 50000 (16.7%).

**Table 1: KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.912
Bartlett's Test of Sphericity	Approx. Chi-Square	5994.036
	Df	210
	Sig.	.000

EFA helps in identifying the underlying structure among the 21 variables in the analysis (Hair et al., 2010). Kaiser-Meyer-Olkin (KMO) measures the adequacy of data for factor analysis, and the KMO came out to be 0.912, which is higher than the acceptable limit of 0.6 as suggested by

Kaiser and Rice (1996). This value shows that the sample is adequate for factor analysis. The value of Bartlett's test of Sphericity was significant at 0.000, which is less than the cut-off limit of 0.05, which means that the factors extracted from the variables are highly correlated

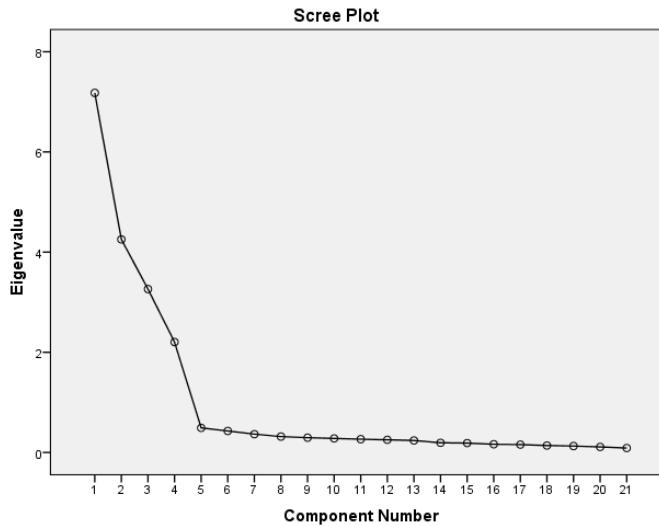
**Table 2: Variance Explained by the Factors**

S.No.	Factor	Variable	Eigen Value	%age of variance	Cumulative percentage
F1	Store Attribute	Service by staff	7.178	34.182	34.182
		Membership benefits			
		Physical Facility			
		Post-transaction service			
		Variety			
F2	Product Attribute	Durability	4.254	20.256	54.438
		Quality			
		Style			
		Fit			
		Price			
F3	External Factors	Influence of family/friends	3.262	15.533	69.971
		Celebrity influence			
		Past experience			
		TV/Magazines			
		Internet			
F4	Consumer Characteristics	Fashion Consciousness	2.204	10.493	80.464
		Preference to wear and try before use			
		Impulse Buying Behaviour			
		Store Image			
		Frequent Shoppers			
		Brand Loyalty			

Through factor analysis, we have extracted four factors out of twenty one variables. In other words, we have transformed twenty one variables into four representative factors. These three factors explain 82.464 percent of the total variance. According to Pett et al., (2003), this

explained percentage was considered as a significant representation of the data. All the four factors have the eigenvalue more than 1. Scree plot explaining the structure of the different attribute in graphical form (figure 1).

**Figure 1: Scree Plot of Different Attributes**



**Table 3: Factor Mining Results of Buying Behaviour**

S. No.	Factors	Mean	Std. Dev.	Factor loading*	Alpha***	KMO****
1.	Service by staff	5.84	1.375	.786	.931	.897
2.	Membership benefits	5.64	1.284	.751		
3.	Physical Facility	5.68	1.287	.776		
4.	Post transaction service	5.62	1.317	.810		
5.	Variety	6.20	1.391	.820		
6.	Durability	6.23	1.010	.780	.896	.876
7.	Quality	6.55	.919	.706		
8.	Style	6.35	1.035	.741		
9.	Fit	6.42	.973	.639		
10.	Price	6.27	1.019	.892		
11.	Influence of family and friends	4.96	1.874	.881	.970	.915
12.	Celebrity influence	4.63	2.039	.913		
13.	Past experience	4.89	1.943	.891		
14.	TV/Magazines	4.67	1.953	.913		
15.	Internet	4.88	2.009	.890		
16.	Fashion Consciousness	5.37	1.561	.813	.961	.942
17.	Preference to wear and try before use	5.73	1.581	.823		
18.	Impulse Buying Behaviour	5.34	1.521	.821		
19.	Store Image	5.45	1.601	.826		
20.	Frequent Shoppers	5.35	1.559	.822		
21.	Brand Loyalty	5.64	1.659	.803		

Table 3 represents the factor mining results which were extracted through exploratory factor analysis. The KMO value of four factors were 0.897, 0.876, 0.915, 0.943 respectively, which is higher than the significant limit of 0.5. The reliability value of the factors are 0.931, 0.896, 0.970, 0.961 which are also above the cut-off limit of 0.5. Items which had factor loading less than 0.5 were removed. All the variables have factors loading more than the significant limit of 0.5. Factor loading shows that among store attribute variety (0.820) was the most important factor followed by post-transaction service (0.810), service by staff (0.786), physical facility (0.776), and membership benefits (0.751). Just like store attribute, from product attribute, it was revealed that price (0.892) was very important variable for consumers. From external factors TV/magazines (0.897) and store image (0.833) from consumer characteristics were taken as the important

factors for the women buyers. Mean, and the standard deviation is descriptive statistics that represent the values in the data and variability or deviation in the data set. Mean values of the variables above 5 represent a high level of attention towards the positive side of the responses, while standard deviation ranging between 1-2 shows that the data set is concentrated towards the mean (Shao, 2002). Table 3 depicts the mean score and standard deviation for the different attributes of buying behaviour. The overall mean score ranges from 5.62 to 6.20 for store attribute, 6.23 to 6.55 for product attribute, 4.63 to 4.96 for external factors, and 5.34 to 5.73 for consumer characteristics on a Likert scale of 1 (strongly disagree) to 7 (strongly agree). All the values are presented in Table 3.

## CONCLUSION

This study expands the knowledge of fashion apparel research and has several implications for designers, manufacturers, retailers, and apparel and textile specialists. The study showed that there are different factors which have an impact on the buying behaviour of the consumers for fashion apparel. This study provides a base to the marketers to the importance of the different factors Consumer characteristics and external factors came out to be critical factors that influence buying behaviour of the women consumers in fashion industry. A consumer characteristic encompasses fashion consciousness, preference to wear and try before use, impulse buying behaviour, store image, frequent shoppers and brand loyalty. Marketers should strategies on the basis of the said factors for targeting women shoppers from generation X and generation Y. Just as garment manufacturers and retailers respect consumers' preferences for apparel styles, consumer needs for benefits should be taken into account by the industry. Both generation X and Y are fashion conscious, so trendy apparel should be given due priority. Both the generation feels that trying before purchasing is significant, so marketers should provide facility for the same. Store image and loyalty also influences purchasing decision of the consumers.

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## A REVIEW ON PREDICTING STUDENT'S GRADE USING MACHINE LEARNING TECHNIQUES

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### ABSTRACT

*Predicting student grade with precision for future course plays very crucial role in their development and more importantly it can help student in improving their academic result and also these prediction model can help teachers to figure it out the low achiever in their subject, so that they can give some kind of remediation to help improve their result. In this study, several papers were analysed with respect to what kind of models they were using and on what kind of data they are implementing and also how diverse their attributes whether they are focusing on academic related data only or considering the extra co-curricular activities and their family background to predict the students' grade, as nowadays multiple factors need to take into consideration as these factors may drastically impact on the students' academic performance, so that a model can predict the student's grade more accurately and can benefit the educators to plan the strategy to help the student to perform better.*

**KEYWORDS:***Prediction, machine learning, grade, decision tree, naïve Bayes*

### INTRODUCTION

In present situation, there is a great need to analyse and predict the academic performance to be able to classify students based on their performance and to find out the set of student who may not be able to do well in their examinations and also the set of student who can perform well in the examination, as it will help teachers to plan their teaching methodology accordingly to give most out of their knowledge to the student and subsequently it will increase the overall performance in academics of the class as a whole. In past few years several studies have been carried out to find the best and suitable approach to have a great prediction model by using different machine learning algorithms such as decision tree, Bayesian Network, Support vector machines(SVM) [2][3][6][7]etc. and for that many outcome and inferences has been drawn from those studies. In this review paper we are going to thoroughly analyse the different studies that had been already carried out over the past few years by different people on different datasets and different conditions.

### LITERATURE SURVEY

The authors implemented a model for students in Tamil Nadu to discover the elements contributing to the poor performance in the senior secondary exam. For the data they arranged the questionnaire that includes their family background, their habits and marks in examination etc. and accordingly a data collection of 772 students obtained from school offices and regular students, and subsequently used for the prediction model i.e. CHAID. The CHAID tree is constructed with the fact that there should be maximum variance between two nodes in the same layer and

minimum variance within a node. After that decision rules were generated with the help of the tree for predicting student grades. And at last it was observed that the overall prediction accuracy achieved by the CHAID was 44.69% [1].

Researcher designed a prediction model for a particular course of distance learning in Hellenic Open University. The Data were collected from two different sources, the records of the tutors and the Students' Registry of the HOU and for this project data of 510 students were taken. Predictions were computed on the actual marks obtained in written assignments, their background and teachers remarks. For this prediction the algorithms used are Sequential Minimal Optimization, Back Propagation, C4.5, 3-Nearest Neighbourhood and Naïve Bayesian Network. In the result it was found that the best suitable algorithm is the Naïve Bayes (72.55%), followed by the Sequential Minimal Optimization (72.03%), the 3-NN (70.77%) and finally the C4.5 (69.79%). The NBN algorithm generates the best results (accuracy 72.48%) [2].

Carried out a research in which they have predicted the student performance with the help of five machine learning algorithms that is Support Vector Machines, Decision Trees, Artificial Neural Networks, and Bayesian Networks. They collected the data of students majoring in Computer science in multiple colleges in Kolkata and the training data contains 309 entries whereas testing data contains 104 entries. Their main objective is to identify the attributes and examination pattern of students majoring computer science. After training with those five algorithms they calculated the F-measure, kappa statistic and also calculated the paired t-

test for both the statistics. And found that C4.5 performs better and accordingly defined the rules for C4.5. And after their detailed analysis they found decision Tree the most convenient algorithm with the training accuracy of 79% and 66% for testing [3].

The authors' main objective is to analyse the performance of students of k-12 class which will help the educators to know the poor performers, so that the focus can be given to them. For this purpose predictive models were developed using three classifiers, namely, Naive Bayes, decision tree and linear regression. In this project the data collected is from the website of Massachusetts Department of Elementary and Secondary Education. And they have 403 entries with 27 variables or features in that data so they have done feature selection with the help of correlation matrix, and trained with the mentioned three classifiers. And at the end they conclude that out of those three Naïve Bayes classification gives the better prediction with about 60 % accuracy [4].

The author addressed, the problem of recognising students who are not doing well in the course of Computer science, four Class models are designed to predict student performance. Many factors affect the accuracy of the results obtained after using the algorithms. These items include refined data, feature domain, number of features, database size and last phase domain. Database size also affected accuracy. Accuracy increased as size increased. Four machines learning strategies, Decision tree, artificial neural network Logistic Regression and Naïve Bayes used. ROC index and their classification accuracy have been used to compare the models. ANN model has a very high ROC index of 0.807 and an accuracy of 77.04 [5].

Researchers used various sources of information, such as traditional databases and multimedia, are often available at educational institutions. These resources help administrators obtain information, predict class time enrolment, and help students decide how to choose subjects based on prediction. Machine learning strategies in educational data the mines aim to create a model to find hidden patterns. The proposed model predicts student performance. The model was trained, and the data was tested with student data in two semesters using algorithms for learning of various machines, such as Decision Tree, NB, and Logistic Regression. The performance of all algorithms was tested to predict two groups of complete and very accurate results were obtained. The exact final grade and the estimated student status are determined by the Logistic Regression, with an accuracy of 68.7% and 88.8% [6].

The authors have developed a line-based model that will help students to know the final grade in a particular subject. The information has been gathered utilizing research given by students and a grade book. The subsequent stage was preparing information for breaking down and naming. Third stage coordinates the information of second stage into the AI calculation. AI Algorithm makes a model utilizing dependent on the handled information. At last, the

ML Algorithm produces the data model containing graphs, charts of the student's performance and give suggestion for the improvement. This model is a variant which means it takes only one variation but can be extended as a multivariate model by adding multiple parameters to get accurate results. This research use four types of factors namely student's contributions, family income, student personal details and past marks. It also complies with the subset selection process to obtain the most effective indicators for predicting student performance [7].

An effort was made to determine the impact of our proposed features on predicting student performance of productive and selective separation models. Feature space is created by looking at family features expenses, family income, personal details, and family property of students. The SVM separator is found to work with our proposed family finance features and student personal information categories. It can be concluded with the results that family spending and personal information has a significant impact on student performance due to the precise reasons given in the interviews [8].

The researchers used the classification technique to predict the performance of the engineering student in their final exam. The basic idea of the project to collect the data of student from the VBS Purvanchal University, Jaunpur (Uttar Pradesh) and apply the different types of decision tree algorithm to the data having 14 attributes. They used three decision tree algorithm that is ID3 (Iterative Dichotomiser 3), C4.5, and CART, after applying all the technique we came to know that C4.5 perform better with the correctly classified instance of 67.77% and incorrectly classify instance of 32.22%. C4.5 model identified which student likely to fail the exam. Therefore the C4.5 decision tree is an effective predictive model [9].

The authors main objective was to use data mining methodologies to study students' performance in the courses. The data is taken of 40 students who is studying a master in computer application having the 7 attributes like PSM, CTG, SEM, ASS, ATT, LW, and ETT. In this project, they use a decision tree algorithm to predict student performance and use three different types of decision trees that are ID3 (Iterative Dichotomise 3), C4.5, and CART. The entire decision tree applied to the data and the result was unexpected that the CART decision tree performs better than the other two decision tree having an accuracy of 56.25%. [10].

The authors have predicted the student performance of the Post Graduate program with the help of K-Means (Clustering) and Support Vector Machine (Classification) algorithm having the data size of 100 students. They implemented the rules that are defined in the SVM algorithm to predict the final grades of student. The output of the models were compared with the original data, the SVM result with 96.7% of accuracy because in its training phase it is very slow but the accuracy was very high [11].

The main objective of this project is to remove the risk associated with the credit product. It distinguishes the effect of various applicant characteristics on the basis of their behaviour as criminal or default using the historical data of the customer. For this, we used Weighted Voting and Cluster-based Feature Selection model on which we applied three real-world credit scoring datasets as Japanese dataset, Australian dataset, and German dataset on this model to predict the risk. It was noted that the proposed feature selection approach on the dataset has improved the accuracy of five classifiers namely decision tree, MLFN, RBFN, NB and PNN when compared to conventional feature selection methods and with all the features. With

weighed voting approach, it also outperforms as compare to conventional feature selection methods [12].

The study shows that the previous marks of a student can be used to make a prediction model using the Decision tree algorithm (DT), which can be used to predict the final grade of a High School Student. The accuracy of the model is 84.53% which means that the model successfully predicts the final grade of students. There were 1,500 students of whom 1268 were successfully classified. It suggested that the teacher, student and their parents could improve the student's result of the lower grades with appropriate student counselling [13].

**TABLE I**  
**COMPARISON OF RELATED WORKS**

S.NO	PAPER	ALGORITHM USED	SAMPLE SIZE	ACURACY OF MODEL	EXPERIMENT APPLIED
1	Ramaswami, M. and Bhaskaran, R.[1].	CHAID	772	44.69%	Higher Secondary Schools, Tamil Nadu
2	Kotsiantis, S., Piarrekeas, C. and Pintelas, P.[2].	C4.5,NBN	510	72.48%	Hellenic open University
3	Acharya, A. and Sinha, D. [3].	C4.5, SMO, NB, 1-NN,MLP	309 training 104 testing	79% training 66% testing	Under graduate students of Computer Science, Kolkata
4	Harvey, J.L. and Kumar, S.A.P. [4].	DT, NB, Linear Regression	403	60%	Massachusetts Public School
5	Altabrawee, H., Ali, O.A.J. and Ajmi, S.Q.[5].	ANN, Logistic Regression, Naïve Bayes, Decision Tree	161	77.04%	Al- Muthanna University
6	Hashim, A.S., Awadh,W.A. and Hamoud, A.K. [6].	DT, NB, Logistic Regression, SVM, SMO, Neural Network	499	66%	University of Basrara
7	Daud, A., Aljohani, N.R., Abbasi, R.A., Lytras, M.D., Abbas, F. and Alowibdi, J.S. [8].	SVM, C4.5, CART, BN, NB	690	86%	University of Pakistan
8	Yadav, S.K. and Pal, S.[9].	ID3, C4.5, CART	90	67.77%	VBS Purvanchal University, UP
9	Yadav, S.K., Bharadwaj, B. and Pal, S. [10].	ID3, C4.5, CART	40	56.25%	VBS Purvanchal University, UP
10	Eashwar, K., Venkatesan, R. and Ganesh, D. [11].	K-mean, SVM	100	96.5%	Students of post-graduation
11	Tripathi, D., Edla, D.R., Kuppili, V., Bablani, A. and Dharavath, R.[12].	Weighted voting , Clustering	Japanese 690, Australian 1000, German 690	87.98%	Japanese, Australian, German customers
12	Khan, B., Khiyal, M.S.H. and Khattak, M.D.[13].	Decision Tree	1500	84.53%	Federal Board of Intermediate & Secondary Education), Pakistan

## CONCLUSION

The aim of this paper is to review and learn from different papers available online and compare them to find out the shortcomings of different models used to predict final marks/grades of a student based on his past record and his behaviour. These projects mentioned above used different Machine learning model like Support vector machine (SVM), Multilayer Perceptron (MLP), Decision tree and Bayesian neural Network. After observing performance of different classifications it is found that the training algorithm Decision tree is an excellent generalizer since it manages to exhibit the highest generalization performance. The Research methodology used proposed in different

papers could be improved on several accounts. Several students took admission in a particular course, and appear in the mid semester exams but due to some reason they do not appear for the term end exams. These students are not considered for prediction as they contain missing attribute. Finally, the efficiency of models can be increased by using a large enough dataset and Combining different model and Classifiers.

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## A STUDY ON IMPACT OF GLOBAL STOCK MARKET INDICES ON INDIAN STOCK MARKET INDICES

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### ABSTRACT

*This study aimed to examine the impact of selected Global stock market indices such as NASDAQ Composite index, Dow Jones Industrial average, Hang Seng Index and NIKKEI 225 on the performance of selected Indian stock market indices such as S&P BSE SENSEX and NSE NIFTY during the year 2019 by considering 240 consecutive trading days' index value. Statistical examinations such as normality of daily returns, homogeneity of average return, correlation and causation have been used. During the study period, the daily returns of selected Global stock market indices and Indian stock market indices were non-normal and the average return remained equal. Statistically insignificant correlation between selected Global stock market indices and Indian stock market indices except Hang Seng Index. Systematic risk exposure pertaining to Indian stock market indices from selected Global stock market indices were found to be statistically insignificant except Hang Seng Index. In nutshell, the selected Global stock market indices have had less impact during the study period.*

**Keywords:** Stock Market, Global Indices, Investment, Normality, Causation

### I. INTRODUCTION

Stock markets play a pivotal role to mobilise investible resources for all the verticals of the industry. In India, the landscape of stock market investments have undergone massive transformation over the last two decades. The extant literature prominently acknowledges the Indian stock markets as the most sought after destination by the foreign investors. The BSE Limited, formerly known as Bombay Stock Exchange Limited is one of the very oldest stock exchange in the world and National Stock Exchange of India is well-known for its application of advanced technology. After 1990s, on account of major revamp of economic regulations and ease of doing business in India, stock market investments have seen exponential growth including enhanced inflow foreign investment. In terms of world output, India has accounted 7.1% under emerging market and developing economies which is highest as compared to other emerging market and developing economies (Source: Securities Exchange Board of India's 2018-19 Annual report). At this juncture, the major concern of the investors' especially foreign investors is that whether investment in Indian stock markets will provide the benefits of diversification catering to their investment objective? Hence, examining the linkages between the Indian stock markets and Global stock markets are pertinent.

### II. LITERATURE REVIEW

**Khan et al. (2005)** attempted to study the linkages between developed stock markets namely NASDAQ, NIKKEI and Indian stock markets such as NIFTY and SENSEX during January 1999 to August 2004. The study showed that there were no long-term relationship between Indian stock markets and selected global indices. They concluded that while markets had no tendency to go together in the long-term and as an impact, the causal effects become weak in the short-run.

**Mukherjee (2007)** chose to study the integration of Indian stock markets with New York Stock Exchange, Hong Kong Stock Exchange, Tokyo Stock Exchange, Korean Stock Exchange and Russian Stock Exchange from the perspective of social, political and economic contexts. They concluded that the Indian stock markets had started to integrate after 2002-03.

**Menon et al. (2009)** contemplated that the real market situations tend to showcase in the market movements nationally and internationally. They had analysed the link between Indian stock markets and stock markets from Hong Kong, US, China and Singapore. They found that Indian stock markets were related to some selected stock markets during the study period.

**Chittidi (2010)** focused to study the integration of BRIC stock markets and examined their integration with other

developed economies such as US, Japan and UK for the period between January 1998 and August 2009. The outcomes of the research showed that BRIC stock markets were cointegrated with developed economies stock markets during the study period and the study inferred that these markets share the forces of short run adjustment to long run equilibrium.

**Tripathi & Sethi (2010)** studied the integration of the Indian stock market with global stock markets such as China, Japan, United Kingdom, and US from 1998 until 2008. Their study had shown that the Indian stock markets have not integrated with any of these markets except United States and found unidirectional causality in most cases.

**Singh & Singh (2010)** examined the extent of integration of two leading emerging economies with other developed markets during January 2000 to December 2009. They found that the Indian and Chinese stock markets were correlated with all the four selected developed markets and exhibited unilateral causality. They suggested that there were no scope for either speculative strategies or short-term diversification in these markets.

**Lao & Singh (2011)** aimed to analyse the existence of herding behaviour and its challenges in the pretext pertaining to efficient market hypothesis considering the Chinese and Indian stock markets. The suggested that the herding behaviour exists in both markets during the study period. The herding behaviour was more prevalent while there was bear market and the trading volume was high in Chinese stock market as compared to Indian stock market. In contrary to Chinese stock market, Indian stock market had exhibited the herding behaviour when the market was moving upward.

**Srikanth & Aparna (2012)** examined the degree of stock market integration considering the monthly average prices pertaining to BSE-Sensex, NYSE, NASDAQ, Hang Seng, Nikkei225, S&P 500, SSE Composite index and FTSE100. They have used Correlation t-test to analyse the intensity of

S. No.	Name of the Index	Country	Index Code
1	S&P BSE SENSEX	India	BSESN
2	NSE NIFTY	India	NSEI
3	NASDAQ Composite Index	USA	IXIC
4	Dow Jones Industrial Average	USA	DJI
5	Hang Seng Index	Hong Kong	HSI
6	NIKKEI 225 Index	Japan	N225

### 3.3 METHODOLOGICAL FRAMEWORK AND HYPOTHESES

**Step 1:** To ascertain the daily return pertaining to the respective indices, the following function has been used.

$$\text{Index Return } (R_I) = \ln \left[ \frac{P_t}{P_{t-1}} \right] \quad \dots (3.3.1)$$

$H_1$ : The daily return does not follow normal distribution.

**Step 2:** To analyse the homogeneity of average performance of the selected global stock market indices and

stock market integration. They found that there were substantial integration between domestic and international financial markets.

**Mensi et al. (2014)** analysed dependence structure between the emerging markets of the BRICS countries and most influential global factors using the quantile regression approach for the period between September 1997 and September 2013. They found that the BRICS stock markets had shown dependence with global commodity and stock markets such as Gold, Oil and S&P Index. They also found that the dependence structure was skewed and this asymmetry perhaps attributed to financial crisis across the globe.

**Nasser & Hajilee (2016)** chose to examine five emerging stock markets namely China, Turkey, Russia, Mexico and Brazil and other developed markets namely Germany, US and UK during January 2001 to December 2014 using cointegration and error-correction model. They found existence of short-run integration amongst stock markets in developed countries and stock markets in the emerging countries.

## III. OBJECTIVES, DATA AND METHODOLOGICAL FRAMEWORK

### 3.1 OBJECTIVES OF THE STUDY

The primary objective of the study is to examine the impact of selected Global stock indices such as NASDAQ Composite Index, Dow Jones Industrial Average, NIKKEI 225 and Hang Seng Index on Indian broad based stock indices such as S&P BSE SENSEX and NSE NIFTY.

### 3.2 DATA

In order to examine the impact of selected Global stock indices on Indian stock indices, the daily index values spanning for 240 trading days during the year 2019 have been obtained from the respective indices website. The selected indices and their codes are as follows:

- $P_t$  and  $P_{t-1}$  are the daily current period's index value and previous period's index value respectively

The daily return of respective indices is analysed for its symmetrical distribution using the following tests to examine the hypothesis.

$H_0$ : The daily return follows normal distribution.

Indian stock market indices, Kruskal-Wallis 'H' test is used to test the following hypothesis.

$H_0$ : Mean performance of Indian stock market indices and Global stock market indices are same during the study period.

$H_1$ : Mean performance of Indian stock market indices and Global stock market indices are significantly different during the study period.

**Step 3:** To examine the degree of relationship between the selected Indian stock indices and Global stock indices, Karl Pearson's correlation coefficient has been

$$\hat{R}_{BSESN} = \alpha_t + \beta_1 IXIC_t + e_t \quad \dots (3.3.2)$$

$$\hat{R}_{BSESN} = \alpha_t + \beta_1 DJI_t + e_t \quad \dots (3.3.3)$$

$$\hat{R}_{BSESN} = \alpha_t + \beta_1 HSI_t + e_t \quad \dots (3.3.4)$$

$$\hat{R}_{BSESN} = \alpha_t + \beta_1 N225_t + e_t \quad \dots (3.3.5)$$

$$\hat{R}_{BSESN} = \alpha_t + \beta_1 IXIC_t + \beta_2 DJI_t + \beta_3 HSI_t + \beta_4 N225_t + e_t \quad \dots (3.3.6)$$

$$\hat{R}_{NSEI} = \alpha_t + \beta_1 IXIC_t + e_t \quad \dots (3.3.7)$$

$$\hat{R}_{NSEI} = \alpha_t + \beta_1 DJI_t + e_t \quad \dots (3.3.8)$$

$$\hat{R}_{NSEI} = \alpha_t + \beta_1 HSI_t + e_t \quad \dots (3.3.9)$$

$$\hat{R}_{NSEI} = \alpha_t + \beta_1 N225_t + e_t \quad \dots (3.3.10)$$

$$\hat{R}_{NSEI} = \alpha_t + \beta_1 IXIC_t + \beta_2 DJI_t + \beta_3 HSI_t + \beta_4 N225_t + e_t \quad \dots (3.3.11)$$

Where ' $\alpha$ ' - constant term, ' $\beta$ ' - exposure term and ' $e_t$ ' - white noise error.

$H_0$ : There is no significant exposure from global stock market indices.

applied. Following hypothesis is set to examine the degree of relationship.

$H_0$ : There is no significant correlation between the selected indices.

$H_1$ : There is a significant correlation between the selected indices.

**Step 4:** To examine the causality between the Global stock indices and Indian stock indices, 2 stages of regression analysis is used. The notions and hypotheses are iterated below.

$$\dots (3.3.2)$$

$$\dots (3.3.3)$$

$$\dots (3.3.4)$$

$$\dots (3.3.5)$$

$$\dots (3.3.6)$$

$$\dots (3.3.7)$$

$$\dots (3.3.8)$$

$$\dots (3.3.9)$$

$$\dots (3.3.10)$$

$$\dots (3.3.11)$$

$H_1$ : There is a significant exposure from global stock market indices.

$H_0$ : Residuals do not contain autocorrelation.

$H_1$ : Residuals contain autocorrelation

#### IV. RESULTS AND DISCUSSIONS

**Table 1: Results of descriptive statistics and normality tests**

Index	Daily Return (Min, Max)		Normality tests		
			K-S	Shapiro-Wilk	Jarque-Bera
BSESN	0.05	(-2.08, 5.19)	0.06**0.019	0.94***0.000	364.62***0.000
NSEI	0.05	(-2.16, 5.18)	0.06**0.032	0.94***0.000	343.62***0.000
IXIC	0.11	(-3.54, 4.17)	0.08***0.002	0.96***0.000	62.74***0.000
DJI	0.08	(-3.09, 3.24)	0.09***0.000	0.95***0.000	108.76***0.000
HSI	0.05	(-2.94, 3.83)	0.06**0.041	0.98***0.003	14.89***0.001
N225	0.08	(-3.05, 2.58)	0.07***0.013	0.98***0.001	14.69***0.001

\*\*\* 0.01, \*\* 0.05, \* 0.1 Level of Significance

It is seen from Table 1 that the daily average return ranges between 0.05% and 0.11% during the study period. NASDAQ Composite Index has yielded maximum daily average as compared to other indices. The study showed that all the selected global stock market indices and Indian stock market indices did not follow normal distribution

during study period. Since all the selected indices have exhibited the same trend, it is immensely relevant to examine whether across markets the daily average return remains same or they significantly differ. The results the homogeneity of average daily return across the indices are explained in Table 2.

**Table 2: Results of Kruskal-Wallis 'H' test**

Hypothesis	Test statistic value	Decision
$H_0: \mu_{BSESN} = \mu_{NSEI} = \mu_{IXIC} = \mu_{HSI} = \mu_{DJI} = \mu_{N225}$ $H_1: \mu_{BSESN} \neq \mu_{NSEI} \neq \mu_{IXIC} \neq \mu_{HSI} \neq \mu_{DJI} \neq \mu_{N225}$	0.491	Do not reject

\*\*\* 0.01, \*\* 0.05, \* 0.1 Level of Significance

In order to test the null hypothesis stated in Table 2, non-parametric 'H' test is used. The test reveals that during the study period, the performance of selected indices measured by average return remained same. This outcome iterates the existence of common trend among the global stock market

indices and Indian stock market indices. Apparently, this paves way for examining cause and effect relationship amongst them. The outcomes of the degree of relationship are explained in Table 3.

**Table 3: Correlation between selected Indian stock indices and Global stock indices.**

Index		IXIC	DJI	HSI	N225
BSESN	Correlation	+0.04	+0.05	+0.13**	-0.00
	Sig.	0.542	0.437	0.044	0.993
NSEI	Correlation	+0.04	+0.05	+0.12*	+0.01
	Sig.	0.537	0.473	0.070	0.866
IXIC	Correlation		+0.89***	+0.12*	+0.07
	Sig.		0.000	0.057	0.259
DJI	Correlation			+0.12*	+0.10
	Sig.			0.072	0.137
HSI	Correlation				+0.09
	Sig.				0.191

Pearson's Correlation (BSESN, NSEI) = +0.995\*\*\* Sig. = 0.000

\*\*\* 0.01, \*\* 0.05, \* 0.1 Level of Significance

It is seen from Table 3 that Hang Seng Index shows statistically significant low degree of positive correlation with S&P BSE SENSEX at 0.05 level and statistically significant low degree of positive correlation with NSE NIFTY, NASDAQ Composite Index, Dow Jones Industrial average and NIKKEI 225 index at 0.1 level. NASDAQ Composite Index and Dow Jones Industrial average exhibits statistically significant high degree of positive correlation at 0.01 level. S&P BSE SENSEX and NSE NIFTY exhibits statistically significant high degree of

positive correlation at 0.01 level. Hence, the initial analysis has shown that the selected indices have either shown no statistically significant correlation or statistically significant very low degree of positive correlation. Although, the preliminary investigation has rendered less significant results, causality examination is carried to validate the impact of global stock market indices on the Indian stock market indices and results are shown in the Table 4 and Table 5.

**Table 4: Results of regression - S&P BSE SENSEX on selected Global stock indices**

Index	Alpha (t, Sig.)	Beta (t, Sig.)	F-test (F, Sig.)	DW Statistic
IXIC	0.05 (0.88, 0.38)	0.03 (0.61, 0.54)	0.37, 0.54	1.89 Do not Reject
DJI	0.05 (0.87, 0.38)	0.06 (0.78, 0.44)	0.61, 0.44	1.89 Do not Reject
HSI	0.05 (0.86, 0.39)	0.11** (2.03, 0.04)	4.11**, 0.04	1.89 Do not Reject
N225	0.05 (0.95, 0.35)	-0.001 (-0.01, 0.99)	0.00, 0.99	1.90 Do not Reject

$$\hat{R}_{BSESN} = 0.05 - 0.04_{IXIC} + 0.08_{DJI} + 0.11_{HSI} - 0.02_{N225} + e_i$$

(IS) (IS) (IS) (S @ 0.1) (IS)

\*\*\* 0.01, \*\* 0.05, \* 0.1 Level of Significance

IS denotes Insignificant, S denotes Significant

Table 4 emphasize the test results of regression analysis pertaining to S&P BSE SENSEX with selected global stock market indices. It is seen from the analysis that when the explanatory variables are examined individually, the systematic risk caused by Hang Seng Index is statistically significant to the extent of 0.11. The autocorrelation test has also shown that the residuals are not auto correlated. The other global stock market indices such as NASDAQ

Composite index, Dow Jones Industrial average, Nikkei 225 are remained statistically insignificant. Multiple regression analysis has also exhibited the similar results as compared to individual regression, iterating, Hang Seng Index is statistically significant at 0.1 level and other indices are insignificant to explain the performance of S&P BSE SENSEX

**Table 5: Results of regression - NSE NIFTY on selected Global stock indices**

Index	Alpha (t, Sig.)	Beta (t, Sig.)	F-test (F, Sig.)	DW Statistic
<b>IXIC</b>	0.04 (0.75, 0.46)	0.04 (0.62, 0.54)	0.38, 0.54	1.87 Do not Reject
<b>DJI</b>	0.04 (0.75, 0.46)	0.05 (0.72, 0.47)	0.52, 0.47	1.87 Do not Reject
<b>HSI</b>	0.04 (0.74, 0.46)	0.10* (1.82, 0.07)	3.31*, 0.07	1.87 Do not Reject
<b>N225</b>	0.05 (0.80, 0.43)	0.01 (0.17, 0.87)	0.03, 0.87	1.87 Do not Reject

**Multiple linear Regression**

$$\hat{R}_{NSEI} = 0.04 - 0.02_{IXIC} + 0.05_{DJI} + 0.10_{HSI} - 0.002_{N225} + e_i$$

(IS) (IS) (IS) (S @ 0.1) (IS)

\*\*\* 0.01, \*\* 0.05, \* 0.1 Level of Significance

IS denotes Insignificant, S denotes Significant

Table 5 depicts the test results of regression analysis pertaining to NSE NIFTY with selected global stock market indices. Individual and multiple regression results have exhibited that Hang Seng Index's exposure is statistically significant at 0.1 level and other global stock market indices' systematic risk exposure are statistically insignificant. Also, the residuals of the regression do not contain any serial correlation.

## V. CONCLUSION

The ever dynamic global investment scenario and its impact on one country's investment climate are constantly researched by the investors to streamline their investment decisions. Hence it is very pertinent in Indian context to examine, how the global stock markets' performance is influencing the Indian stock markets. This study focuses on measuring the impact of selected global stock market indices such as NASDAQ Composite Index, Dow Jones Industrial Average, Hang Seng Index and NIKKEI 225 on the performance of Indian broad based stock market indices such as S&P BSE SENSEX and NSE NIFTY. The study indicates that during the study period, the return distribution pertaining to selected global stock market indices and Indian stock market indices are not normally distributed and their average performance remained equal. The degree of relationship measured by Correlation indicates that they predominantly exhibit statistically insignificant correlation except Hang Seng Index. Although there is statistically significant correlation found with Hang Seng Index, it accounted very low degree of positive correlation. The causation analysis revealed that there was no statistically significant systematic risk exposure from the selected global stock market indices though Hang Seng showed feeble statistically significant systematic risk exposure. Thus, overall, the selected global stock market indices had no impact on the performance of selected Indian stock market indices. However, attributing to the extant literature, examining the market movements nationally and internationally will strengthen investment decisions.

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## DEMOGRAPHIC VARIABLES AND THEIR RELATIONSHIP WITH LIFE SATISFACTION: AN EMPIRICAL STUDY OF MILLENNIALS OF DELHI, INDIA.

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### ABSTRACT

*The purpose of this empirical study is to examine the levels of Life satisfaction among the millennials of Delhi-India, using a newer scale called the Riverside Life Satisfaction Scale (2018). A questionnaire-based study was conducted on 530 millennials to assess the relationships between the six demographic variables and the Life satisfaction. The data was analyzed using ANOVA and t-test. The results indicated that out of the six variables, only gender had no significant relation with the Life satisfaction levels. Married millennials, in the age range of 35-38 years, having higher income level of above INR 500000, with Post Graduate education level, engaged in Business, had significantly higher level of Life satisfaction than others.*

**Keywords:** Life satisfaction Millennials; Riverside Life Satisfaction Scale; Demographic variables

### 1. INTRODUCTION

Current era is an era of dynamism. With the advent and penetration of internet and related technology, life has become as quick as a click on a phone. This has resulted in drastic change in the lifestyle of everyone, for some it has been a boon and for some it has an adverse effect on them as well as their environment. This highly dynamic environment is not only demanding, but also exerts a lot of pressure. This can result in increased stress and reduced life satisfaction. The youth of today, the so called millennials, are unfortunately facing such an environment.

Many past studies have been conducted to ascertain the associations between various demographic variables and life satisfaction. But it is in recent times that the focus has been shifted to youth and millennials. In India, 52.2% of the population is under 25 years of age as per the 2011 census (The Registrar General and Census Commissioner, 2011). This necessitates the need to conduct a study in this regard.

#### 1.1 Definition of Life Satisfaction

Life satisfaction is a cognitive judgement of one's own life. It is the evaluation of quality of life based on one's own subjective criteria (Shin and Johnson, 1978). Life satisfaction for Sumner (1966) is "A positive evaluation of the conditions of your life, a judgement that at least on balance, it measures up favorably against your standards or expectations."

Thus, in simple words, life satisfaction can be concluded as the degree of satisfaction which a person enjoys from

his/her own life. Satisfaction is basically a state of mind that also refers to both 'contentment' and 'enjoyment'. This enables a person to appraise the quality of his/her life to see if they like the life, he/she leads.

Life satisfaction can sometimes be interchangeably used with 'happiness' or 'subjective well-being'. This practice, however, is not really accurate. Subjective well-being (SWB) has three separable components: positive affect, negative affect and life satisfaction (Diener, 1984). The first two components of subjective well-being refers to affective, emotional aspects and the latter to the cognitive-judgmental aspects. Thus, life satisfaction is in fact a cognitive constituent of subjective well-being. Maddox (1987) in the encyclopedia of aging has also defines life satisfaction as subordinate construct of subjective well-being (SWB), others being happiness, mood and morale. It is thus, contentment with one's own life in general.

#### 1.2 Defining Millennials

Oxford Living Dictionaries describes a millennial as "a person reaching young adulthood in the early 21st century". These are also called as the Generation Y. Different authors define millennials differently as per their studies. Pew Research Centre, Washington, D.C., defined millennials as those who are born between 1981 and 1996. Anyone who is in the age group of 23-38 years as of January 2020, can be classified as a millennial. . Most of the population (i.e. : 92 million) is in the category known as the millennials.(Shetty, Bhandary, Chandra, & Shetty 2018). They are said to be chief wage earners comprising of a significant proportion of working population in India. Thus, studies governing

their life satisfaction are not only rare but also of a great significance for any economy.

## 2. THEORETICAL BACKGROUND: MEASUREMENT OF LIFE SATISFACTION

Different scales or approaches for measuring the life satisfaction have been developed. Some of these scales or approaches, as identified while reviewing the literature, are quoted below:

SWLS- Satisfaction With Life Scale is a multi-item scale to measure life satisfaction as a cognitive-judgement process (Diener, Emmons, Larsen & Giffin, 1985). SWLS is the most widely used measure of life satisfaction comprising the majority of citations in the literature reviewed.

TSWLS- Temporal Satisfaction With Life Scale assesses life satisfaction using SWLS by taking time into consideration. This is done by including each of the items of SWLS for assessing life satisfaction with one's past, present and future lives.(Pavot, Diener & Suh,1998).

Michalos (1980) in his study used items that individually refer to satisfaction with a different life domain. These items can take forms of various variables for example, finances, friendship and health.

RLSS- the recent addition to this practice of measuring life satisfaction is the Riverside Life Satisfaction scale developed in 2018. Due to some contradictions in the fifth item of the SWLS scale (Pavot and Deiner, 1993,2008), RLSS was developed to put forward a new scale which included strengths of SWLS and to acknowledge it's lacking spheres.(Margolis, Schwitzgebel, Ozer, Lyubomirsky, 2018).

A great deal of empirical studies have been conducted which has given many predictors and sources of effecting one's satisfaction with lives. Brown & Duan (2007), conducted a study to study the role of self-efficacy along with various demographic variables, on the life satisfaction of members of APA (American Psychological Association). They concluded that spouse/partner self-efficacy and problem-solving coping were major predictors influencing one's satisfaction with life. Boran Toker (2011) also conducted an intensive study on 648 academicians working in the Universities of Turkey. He intended to find out how various demographic variables had an impact on the life satisfaction of various academicians. Plethora of studies have been conducted to check the impact of various demographic variables like age, gender, marital status, educational levels, and income levels on various sample sets.

Edwards & Klemmacks (1973) conducted a study to check the relationship between 22 variables and life satisfaction

among 274 females and 233 males aged 45 years and above. They concluded that socioeconomic status, personal and social background, formal participation, informal involvement, and health status have significant impact on life satisfaction. Lee et al., (2004) studied the predictors of life satisfaction among 194 Korean nurses. They concluded that the life satisfaction among selected Korean nurses was average and the most significant predictor in the life satisfaction among Korean nurses was the shift pattern. Suar et al., (2019) in their study stated that there are activities which promote personal relationships and emotional stability, and that in turn can improve the subjective well-being among millennials. Bryant & Constantine (2006) also tried to explore the relationship between multiple role balance, job satisfaction and life satisfaction among 133 working school counsellors. Nair & Gaither (1999) also conducted a study to check the gender based differences among faculty and reported that no significant difference was found in life satisfaction in male and female faculty.

## 3. AIM OF STUDY

There are studies to check the applicability of the most dominant scale –SWLS (Oshi, 2006; Tucker, Ozer, Lyubomirsky & Boehm, 2006; Arrindell, Heesink, Feij, 1999, etc.), but rare attempts have been noticed to practically apply the recently developed RLSS scale and that too in a different cultural context. Also, conducting studies on the life satisfaction among millennials is of great significance for any economy. Thus, the aim of the study is twofold:

- To study the relationship between Life Satisfaction and demographic variables (age, gender, marital status, qualification, profession and income) of the millennials and,
- To measure the life satisfaction among millennials using Riverside Life Satisfaction Scale.

## 4. METHODOLOGY

### 4.1 Participants

At the time of research, all those who were millennials, meaning who were in the age range of 23-38 years, residing in the capital of India, Delhi, were contacted. Initially, a questionnaire was circulated via a web link in the social circle of the researcher who were millennials residing in Delhi, India, and they were requested to refer and forward the same questionnaire in their millennial social circles. Thus, a chain of referrals was formed which snowballed into 553 responses. 23 responses were deleted as deemed unfit for the study. This gave a total of 530 workable group of respondents. The demographic details of the respondents are given in the table 1.

**Table-1 Demographic profile of the respondents**

Gender	%	n	Marital Status	%	n
Males	45.7	242	Married	65.9	350
Females	54.3	288	Unmarried	34.1	180
Age	%	n	Income	%	n
23-26 years	18.5	98	Below INR 100000	15.8	84
27-30 years	31.7	168	Between INR 100000-200000	3.8	20
31-34 years	28.3	150	Between INR 200000-300000	5.3	28
35-38 years	21.5	114	Between INR 300000-400000	14.3	76
			Between INR 400000-500000	26.8	142
			Above INR 500000	34	180
Profession	%	n	Education	%	n
Student	9.8	52	10+2	4.2	22
Research Scholar	2.6	14	Graduate	30.2	160
Service	52.8	280	Post graduate	62.6	332
Business	29.1	154	Ph.D.	3	16
Home maker	5.7	30			

#### 4.2 Measures

Life satisfaction was assessed using the Riverside Life Satisfaction Scale (RLSS) developed in 2018 (Margolis, Schwitzgebel, Ozer, Lymbomirsky, 2018). This is relatively a newer scale which consisted of 6-items measuring one's subjective well-being. The review of literature showed that majority of the studies conducted in this field used the conventional SWLS- Satisfaction With Life Scale, which is a 5-item scale developed by Diener, Emmons, Larsen & Giffin (1985). Responses were rated on a 7-point Likert scale ranging from 1 "strongly disagree" to 7 "strongly agree". This research gap was identified and worked upon in this study. The internal reliability of the scale was estimated to be around .93 (Margolis, Schwitzgebel, Ozer, Lymbomirsky, 2018). Cronbach alpha reliability coefficient for the present sample participants was 0.91, indicating high scale reliability.

The questionnaire was divided into two sections. First section asked for the demographic profile of the respondents and had six major variables, which were age, gender, marital status, profession, qualification and income. The Second section included six statements from the RLSS scale to measure Life Satisfaction (Margolis, Schwitzgebel, Ozer, Lymbomirsky, 2018).

For the purpose of meeting the objectives in the current study, Independent sample t-test and One-way ANOVA were computed to assess differences or the relationships in level of life satisfaction related to the selected six demographic questions. Tukey test was then used for post hoc comparisons of ANOVA at 95% confidence level. All the analyses were performed using SPSS 16.

#### 5. FINDINGS

ANOVAs (with post hoc tests - Tukey) and t-tests were computed to determine relationships of age, gender, marital status, profession, qualification and income with the level of Life satisfaction of the millennial respondents of Delhi, India. Significant differences were found among life satisfaction scores for age, marital status, qualification level, profession and income level. No significant differences were found for gender.

Millennials in the age range of 35-38 years ( $M=5.78$ ,  $S.D=0.81$ ) have significantly higher levels of satisfaction as compared to millennials of age range 31-34 years ( $M=5.35$ ,  $S.D=0.71$ ), 27-30 years ( $M=5.06$ ,  $S.D=0.85$ ) and 23-26 years ( $M=4.43$ ,  $S.D=0.71$ ). Millennials who were Post Graduate had highest level of life satisfaction ( $M=5.4$ ,  $S.D=0.85$ ) followed by Ph.D. ( $M=5.31$ ,  $S.D=0.35$ ), Graduate ( $M=4.88$ ,  $S.D=0.88$ ) and then 10+2 ( $M=4.2$ ,  $S.D=0.71$ ) at the last. Millennials engaged in Business ( $M=5.43$ ,  $S.D=0.8$ ) had maximum level of satisfaction as compared to Research Scholars ( $M=5.28$ ,  $S.D=0.55$ ), Service ( $M=5.23$ ,  $S.D=0.91$ ), Homemaker ( $M=5.08$ ,  $S.D=0.53$ ). Students were least satisfied ( $M=4.25$ ,  $S.D=0.76$ ). Millennials who earned annual income above INR500000 ( $M=5.81$ ,  $S.D=0.76$ ) had significantly higher levels of satisfaction as compared to those earning between INR400000-500000 ( $M=5.26$ ,  $S.D=0.63$ ) followed by those earning between INR300000-400000 ( $M=4.7$ ,  $S.D=0.43$ ), between INR200000-300000 ( $M=4.65$ ,  $S.D=0.48$ ), between INR100000-200000 ( $M=4.56$ ,  $S.D=1.45$ ) and below INR100000 ( $M=4.45$ ,  $S.D=0.78$ ) respectively. Married millennials ( $M=5.56$ ,  $S.D=0.78$ ) were more satisfied than unmarried millennials ( $M=4.56$ ,  $S.D=0.76$ ). No significant differences were traced in the life satisfaction of two genders. The results are shown in the table 2 and 3.

Table-2 Results of the t-test

Characteristics	df	t	Sig.
Gender	528	-0.20	0.83
Marital Status	528	13.12	0.01

Table-3 Results of ANOVA

Characteristics	df	F	Sig.
Qualification level	3	23.51	0.01
Profession	4	19.97	0.01
Income	5	59.65	0.01
Age	3	55.06	0.01

## 6. CONCLUSIONS

In this study the major focus was set to utilize the RLSS-Riverside Life Satisfaction Scale which has been recently devised to measure life satisfaction. Majority of the previous studies in this regard have been using the tried and tested SWLS. RLSS has provided a 6-item scale instead of a 5-item scale provided by SWLS. Thus, this dearth of studies utilizing the RLSS ignited need for this study. Also, the review of literature has provided with the numerous variables which can affect or predict the Life satisfaction of an individual. Hence, assessing the relationship between the most popular predictors, Demographic variables, with the Life satisfaction of the millennials has been done in a very culture-rich economy of India (Delhi). Millennials have been a center point of many studies and such is the case in the present study.

The results have indicated that out of the six demographic variables chosen for the study (age, gender, marital status, profession, qualification and income), only the gender variable showed no such significant relationship with Life satisfaction. Married millennials, in the age range of 35-38 years, having higher income level of above INR 500000, with Post Graduate education level, engaged in Business, had significantly higher level of Life satisfaction than the others.

Life satisfaction has proven to be an important topic for researchers. This can effectively indicate the living environment of an economy. Thus, conducting researches in this field can be beneficial for many stakeholders related to that economy, be it millennials in the present study, rest of the population, government, producers, marketers and alike. Further research needs to be conducted taking other variables like sociological, psychological, physiological, etc. into consideration. The study can also be conducted in a different cultural setting other than Delhi, India.

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## AN ANALYSIS BETWEEN THE RELATIONSHIP OF PERCEIVED ORGANIZATIONAL POLITICS AND DEFENSIVE SILENCE IN INDIAN PRIVATE SECTOR BANKS

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### ABSTRACT

*Employees are the most valuable assets of the organizations. They provide information, feedback, ideas and, opinions for adopting change and developing their organization. For an organization, without the involvement of employees, it is not possible to survive in market. Organizational politics is perceived as positively and negatively both. When it is perceived negatively, employees remain silent; which is not beneficial for any type of organization. The present study was conducted to find out relationship between perceived organizational politics and defensive silence among the employees of Indian private sector banks. On the basis of 150 respondents, it was found that there was significant and positive relationship between perceived organizational politics and defensive silence*

**Keywords:** General Political Behaviour, Perceived Organizational Politics, Defensive Silence

### 1.0 INTRODUCTION

Some form of politics will appear where humans are participating and it is believed that it influences their behaviours as well as their work performance (Gandz & Murray, 1980). Politics prevails when individuals or groups compete for limited resources because organisations are complex social institutions subject to competition among departments, teams, units and individuals, thus organizational politics is an inevitable reality and organizational outcomes, expectations, relationships, efficiency and processes are greatly influenced and affected (Vigoda; 2011, Newstrom; 2007).

According to Mintzberg (1985) "Organizational politics is referred to a set of behaviours performed to enhance or protect self-interest (individual or group) by any means or at any expenses of organizational goals." Organizational politics has subjective and objective views. In the subjective view of organizational politics, which describes the perception of one or his/her mind's psychological state of politics within the organization and is therefore called perceived organizational politics. Different studies and findings attract scholars to explore it more (Atinc, Darrat, Fuller, & Parker, 2010; Ferris, Harris, Russell, & Maher, 2018; as cited in Wijewantha, P., Jusoh, M., Azam, S. F., & Sudasinghe, 2020)

Employees are most important assets of any organization. They provide valuable feedbacks, information, ideas, and, their opinions to the organization from which an organization will achieve success in competitive era. But sometimes, employees perceive organizational politics as negative phenomenon and don't share such information or feedback to the organization. This will negatively impact an organization. So, it is necessary to understand what type

of silence employees have and to what extend perceived organizational politics impact it.

The next sections discussed about the literature review followed by the conceptual framework. After that, research methodology part discussed followed with the results, discussion, managerial implications, and limitations with future implications.

### 2.0 LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Literature provides a broad understanding about the facts and help into the conduct of further studies to explore more about the particular area. For the present paper, literature review had been done as under.

#### 2.1 Perceived Organizational Politics (POP)

According to Pfeffer (1981), "Organizational politics is all about studying organizational power in action". Ferris, Harrell-cook & Dulebohn (2000, p. 90) defined that "Perceived organizational politics involves an individual's attribution of behaviours of self-serving intent and is defined as an individual's subjective evaluation about the extent to which the work environment is characterized by co-workers and supervisors who demonstrate such self-serving behaviour."

In the study of Kachmar and Baron (1999) revealed that if organizational politics perceived negatively then its effect on performance, satisfaction, turnover intention and so on. Studies have pointed out many negative impact of it, for example increased tension (Ferris, Frink, Galang, Zhou, Kacmar, & Howard, 1996), decreased organizational engagement

(Cropanzano et al., 1997), turnover and absenteeism intention (Cropanzano et al., 1997; Ferris et al . , 1993;

Vigoda, 2000), job dissatisfaction (*Cropanzano et al., 1997; Bozeman, Perrewe, Hochwarter, Kacmar, & Brymer, 1996*), decreased performance (*Vigoda & Kapun, 2005*) organizational silence, employee silence (*Khalid and Ahmed, 2016*) and so on. Perceived organizational politics divided into three dimensions by *Ferris and Kacmar (1991)*:

- A) General Political Behavior:** The general political behavior (GPB) mainly considered where no clear rules and regulations and high political activity may be present. Individuals have a window to interpret these rules and regulations according their political skills.
- B) Go Along to Get Ahead: (GATGA)** as lacking of action by employees. To stay away from conflicts, some employees may silently support specific person or group. This is an important tactic to achieve self-interest in a political environment, without disclosing much.
- C) Pay and Promotion Policies (PPP):** *Kacmar and Ferris (1993)* defined that pay and promotion policies encourage individuals to behave politically. When employees will not get their pay increase or promotion according to their real performance, they act politically (*Ferris, Russ and Fandt, 1989; Ferris and Kacmar, 1993*).

## 2.2 Silence

*Albert Hirschman (1970)* first coined the term ‘Silence’ in organizational context. Employee Silence was proposed by *Pinder and Harlos* in 2001. Organizational silence is used to discuss organizational level phenomenon and employee silence is used to analysis individual level. *Tangirala and*

*Ramanujam (2008, p. 41)* defined employee silence as “employees’ intentional withholding of critical work-related information from other members of their workgroup”. Defensive silence is a dimension of employee silence.

Employees remain silent at their workplace due to reprisal or punitive action may be taken against them (*Brinsfield, 2013*). It is proactive in nature and used as self-protection in uncertain politically laden environment. Scholars also explored that employees feel insecure when management ask them about their opinion and ideas Researchers (*Milliken, Morrison, & Hewlin, 2003; Van Dyne, Ang, & Botero, 2003 as cited in Otsupius A. I., 2019*), that why employees remain in defensive mode and don’t speak anything.

## 2.3 The following hypotheses are suggested in the reference to the literature review:

*H1: There is a significant relationship between GPB and defensive silence.*

*H2: There is a significant relationship between GATGA and defensive silence.*

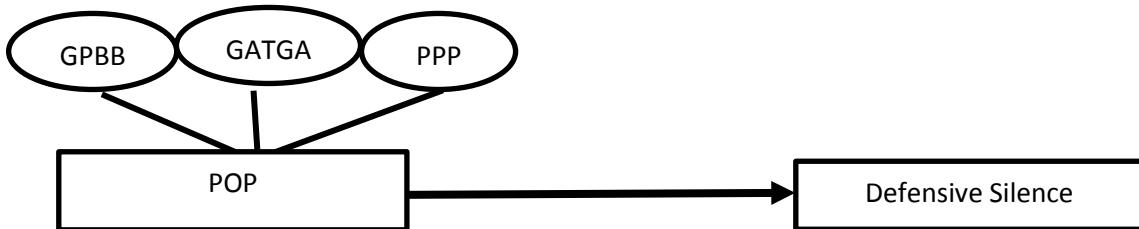
*H3: There is a significant relationship between PPP and defensive silence.*

*H4: There is a significant relationship between Perceived Organizational Politics and defensive silence.*

## 3.0 CONCEPTUAL FRAMEWORK

The study's objective is to describe the relationship among the dimensions of perceived organizational politics and defensive silence in Indian private sector banks. The expected linkagebetween perceived organizational politics as independent variable and defensive silence as dependent variable are presented in Figure 1 (See Figure 1).

**Figure 1: Conceptual model showing relationship between Perceived Organizational Politics and Defensive Silence**



*Source: Author's own compilation*

## 4.0 RESEARCH METHODOLOGY

The next stage of this study is to empirically define the relation between dimensions of perceived organizational politics and defensive silence. To achieve this goal an empirical study was undertaken in India of various private sector banks. The present research indicates understanding the relation between defensive silence and perceived facets

of organizational politics and further analysis of its impact on defensive silence.

### 4.1 Research population and sample:

In the present study, convenience sampling was used for the data collection. Data was collected from Chandigarh and Gurugram. The employees above the clerical rank from private sectors banks were selected for data collection. A

total of 150 respondents provides their responses from the selected private sector banks.

#### 4.2 Research Methods:

Correlation and regression methods were used to test the hypothesis and problem of the study analysis using a survey tool. Questionnaire were distributed to collect the data from the respondents because it is considered that survey method is a suitable method for exploratory studies.

#### 4.3 Tools used:

A scale developed by *Kacmar and Carlson (1997)* named POPS was used under which three dimensions and 15

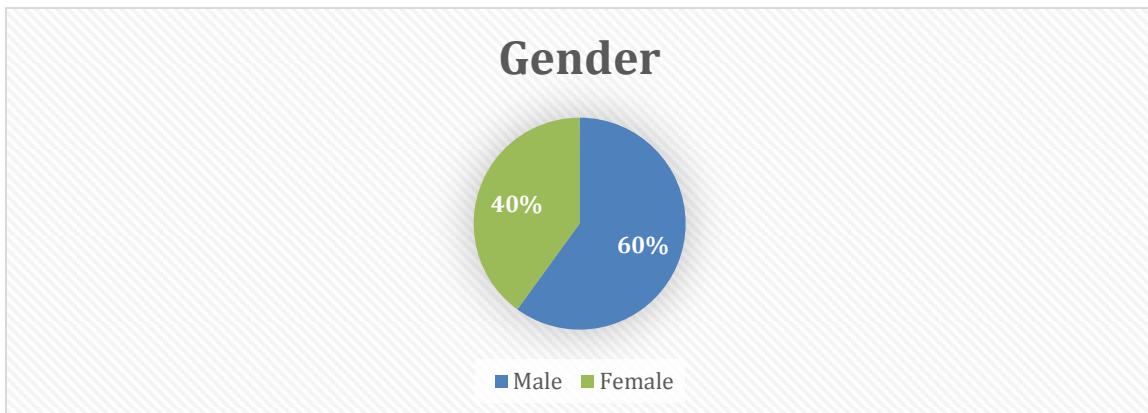
items in total. A scale proposed by *Brinsfield (2013)* was used, under which 6 items related to defensive silence. Seven-point Likert scale was used under which 1 denotes strongly disagree and 7 denotes strongly agree.

### 5.0 RESULTS AND DISCUSSION

Under this section, first section demonstrates the results (descriptive & inferential) and following section discussed about the results of the study.

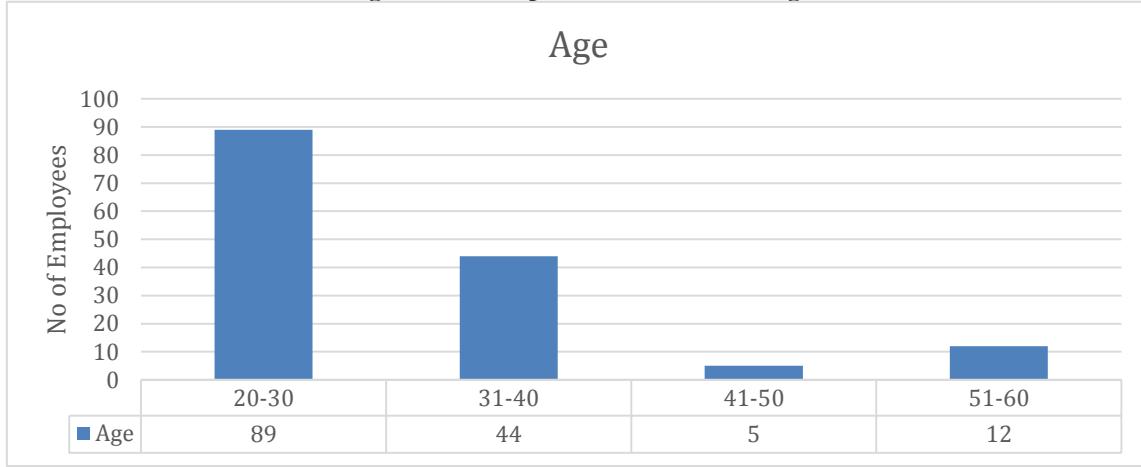
**5.1 Demographic Profile:** The total sample size was 150. The group has following information regarding demographic profiles (see figure 2,3 & 4)

**Figure 2: Descriptive statistics about Gender**



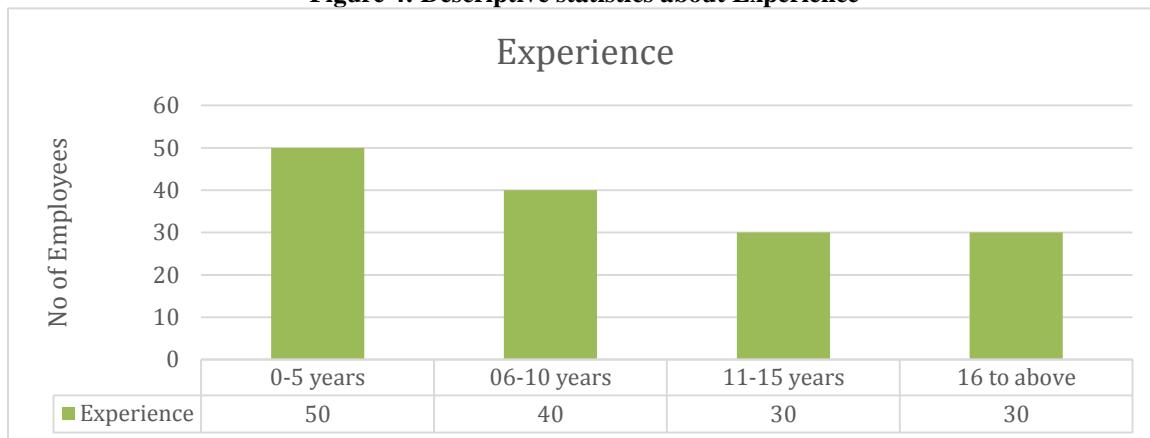
Source: Author's calculation

**Figure 3: Descriptive statistics about Age**



Source: Author's calculation

**Figure 4: Descriptive statistics about Experience**



*Source: Author's calculation*

**5.2 Relationship between Independent and Dependent Variables:** Correlation among the variables as shown below in table 1.

**TABLE 1: Correlations Matrix**

	Variables	Mean	Std. Dev	1	2	3	4	5
1	<b>GPB</b>	3.89	1.35	1				
2	<b>GATGA</b>	4.13	.99	0.65**	1			
3	<b>PPP</b>	2.78	.89	-0.91	0.19	1		
4	<b>POP</b>	3.80	.61	0.61**	0.38**	0.31**	1	
5	<b>Defensive Silence</b>	4.29	.53	0.30**	0.25**	0.19*	0.51**	1

\*\* Significant at 0.01 level, \* Significant at 0.05 level

As shown in Table 1, in private sector banks of India all the dimensions i.e. General political behaviour (GPB), Go along to get ahead (GATGA), Pay and Promotion policies (PPP), and, Perceived organizational politics (POP) have a significant positive correlation with Defensive silence. From the table it is observed that Perceived organizational politics has 51 percent correlation with defensive silence.

From the dimensions of POP, General political behaviour has the highest correlation with defensive silence. Pay and Promotion policies have the least correlation with defensive silence. From the above findings we can conclude that the employees in private sector banks in India are remain silent or play a defensive mode when they feel politics as a negative phenomenon in their organization.

#### Results of Regression analysis

**TABLE 2: Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate			
					R Square Change	F Change	Sig. F Change
1	.477 <sup>a</sup>	.227	.206	.44337	.227	10.587	.000

a. Predictors: (Constant), POP, PPP, GATGA, GPB

b. Dependent Variable: DEFENSIVE

**TABLE 3: ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.324	4	2.081	10.587	.000 <sup>b</sup>
	Residual	28.308	144	.197		
	Total	36.632	148			

a. Dependent Variable: DEFENSIVE

b. Predictors: (Constant), POP, PPP, GATGA, GPB

**TABLE 4: Coefficients**

Independent variables	Dependent variable		
	Beta	t	Significance
GPB	-.34	-0.28	.78
GATGA	0.11	1.16	.25
PPP	0.05	0.63	.54
POP	0.43	4.06	.00*

Significant correlation = \*p<0.05 (two-tailed)

Table 2 reveals that independent variables explained 22.7 % variance in defensive silence ( $F$  change= 10.58,  $p<0.05$ ). According to Table 4, the result shows that General political behaviour ( $\alpha= -0.34$ ,  $p> 0.05$ ), Go along to get ahead ( $\alpha= 0.11$ ,  $p> 0.05$ ), Pay and Promotion policies ( $\alpha= 0.05$ ,  $p> 0.05$ ) are not directly associated with Defensive silence. Thus, hypotheses H1, H2, and, H3 were not supported. Another variable called Perceived organizational politics ( $\alpha= 0.43$ ,  $p<0.05$ ) was positively associated with Defensive silence and explain the variance in it. Thus, hypothesis H4 was supported.

### 5.3 Discussion

Information sharing has become an important asset in this competitive era and organizations focus specifically on people who are eager to seek knowledge and willing to learn. "As knowledge becomes more central to competitiveness, the ability of individuals and organizations to learn becomes a primary means for winning" (Ulrich *et al.*, 1995). Thus leaders in companies motivate workers to express freely at all levels of the company, understanding the fact that information can be generated at any level of an organization.

This study was conceived to gain insight into the relationship between perceived organizational politics and defensive silence. Overall, the analysis provides ample evidence to prove that the perceived organizational politics contributed positively to the defensive silence.

### 6.0 Managerial Implications

This study presents an analysis of the relationship in Indian private sector banks among the dimensions of perceived organizational politics and defensive silence. In the present research, perceived organizational politics were established and analysed as the significant variable affecting the increasing organization's growth. The perception of employees regarding organizational politics is different from each other.

For a manager, it is necessary to understand the negative impact of perceived organizational politics on organization and take corrective measures to convert into positive directions. It is also necessary for the manager to find out the different types of motives behind the silence of the employee. It helps the manager as well as organization to break their employees' silence and help them to raise their voice. It is necessary for an organization that employees provide their views, feedback to their organization. It will great helpful for organization to develop and make itself stronger from inside.

It could be concluded from the study that the dimensions of perceived organizational politics are not directly correlated in terms of their relationship with the defensive silence. Over the past few years, research on perceived organizational politics has been continuing on and this theory has attracted much attention in the organizational literature. The research would connect the alleged organizational dynamics to current literature as: it helps in

knowing the cause of silence and understanding about defensive silence. Thus, the research contributes in the existing literature and theory of perceived organizational politics and silence.

### 7.0 LIMITATIONS AND FUTURE IMPLICATIONS

The study was included only few areas through which this study not generalized to all private sectors. Further, it includes only Indian private sector banks and only a dimension of employee silence.

For future research, it is suggested that public sectors banks will be also include for better and generalized the results. It is also suggested to explore the relationship and impact of perceived organizational politics with more dimensions of employee silence. The study can be expended to the other sectors such as IT, Pharmaceutical and other Govt. owned subsidiaries.

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## AN EMPIRICAL STUDY ON WORK ENGAGEMENT OF REMOTE WORKFORCE

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### ABSTRACT

*Covid crises has ushered in many changes in the ways businesses operate worldwide and the world of work too is undergoing a paradigm shift. Globally, education is one of the sectors which are facing immense disruption due to the ongoing pandemic. Online teaching became the buzzword in the academic world and the offline classroom teaching has paved way for the virtual classrooms. The entire academic fraternity is severely impacted by the chaos and is still adapting to the new teaching-learning scenario. The present study explores the work engagement level of teachers amidst the rapidly evolving academic environment which has affected the teaching learning process across the world. An internet based cross sectional study of 208 higher education teachers who are working from home was done. Social support and organizational support were positively linked with work engagement while the family life negatively affected work engagement of employees. The successful implementation of the online teaching method significantly depends on the active involvement of academic fraternity and the present study indicates that the work engagement level of teachers is quite low in the current scenario and has several implications for successful delivery of online education in the current pandemic situation.*

**Keywords:** Covid-19, work engagement, multiple regression, UWES 17, Work from home.

### INTRODUCTION

The year 2020 would go down in the annals of history as the year of disruptions, chaos, uncertainty and turbulence due to Covid 19 pandemic. Remote work, telecommuting, and work -from - home have become the new normal (Bandhyopadyay,P., 2021). The recently unveiled New Education Policy, 2020 emphasized on the pivotal role of teachers in the educational reforms. Online teaching has brought a paradigm shift in the realm of education and the teachers globally are bracing themselves to the sudden changes in their academic environment.

Employee engagement is generally characterized as an employee's degree of commitment and identification with organization values(Gruman& Saks, 2011). If an employee is involved, s/he is conscious of her/his responsibility in the company and motivates their colleagues to succeed. The employee's positive attitude to the place of employment and their set of values is often referred to as her/his positive relationship with her/his work. Engaged staff go beyond the task of executing their excellent functions(Saks, 2006). The empirical work examines the work engagement levels of teachers in higher education amidst the ongoing pandemic. The study also examines the linkage between work engagement and social support, organizational support and health personal lives of employees working from home.

### LITERATURE REVIEW

Human capital is one of the key resources in an organization and a competent workforce is one of the key drivers of success. Employee engagement is a measure of commitment of an employee towards the organization and

is positively related to job performance (Chaudhary, R. et al, 2011). Research on the employee engagement has yielded different engagement factors in different organizations as well as different countries. Among the determinants of the employee engagement is leadership. Leadership has a positive effect on employee engagement, particularly by providing support and feedback to the employees. In order for employees to be supported adequately, regular communication between employees and leaders is necessary. It is now more important than ever that leaders seize the opportunity to discover how their employees work, to provide guidance to help them with any challenges or barriers, to identify support they need, to ensure adequate resources are available, to establish and review tasks and objectives and to provide meaningful feedback and support( Markos&Sridevi, 2010;Joshi &Sodhi, 2011; Benuyenah& Pandya, 2020). Another most crucial factor of the employee engagement is having the right virtual tools in place. With a dispersed staff, an employee have to work much harder to make remote working or WFH workers feel like they are part of the organization culture. The degree of employee engagement can have an important impact and companies should allow remote staff to work together as if they really were next to each other to get the most from them(Shuck, Reio, & Rocco, 2011;Chanana &Sangeeta, 2020).Previous studies have also highlighted the importance of virtual teamwork and collaboration in the modern organizations.

In the time of stress due to the lockdown, maintaining sound mental health is also important. Employers need to adopt wellness measures that positively affect the mental

health of employees. To provide formal evaluations and mental health services, it is necessary to run employee assistance programs (Bedarkar&Pandita, 2014; Attridge, 2009).

Virtual Group Training Programs is emerging as popular tool for training employees due to the Covid-19 pandemic. Investing in team's personal development comes with a lot of benefits. Organizations are showing their employees that they value them, want to support their growth in organization, and are equipping them with tools to be even more effective in their role(Shuck et al., 2011). There are various virtual group tools to improve the employee engagement.

Employee engagement activity through entertainment is becoming crucial in today's working environment. As difficult as social distance can be, the commitment does not have to be linked inside the walls of the workplace as it was but using this opportunity to learn about each other and what is really good for the team. The top management can be open for new ideas. There are some recommendations found in the past studies. For example, virtual yoga or training classes—members of a team will take turns running a class or jointly enter a certified online training course(Tsai, 2016).As engagement may be affected by these factors, the aim of the study was to examine the engagement level of teachers in the current turbulent environment and to explore the link between social support, organizational resources, health and family lives with the work engagement.

## METHOD

### Participants

The target participants of the present study are the academics who are teaching in colleges/universities and are/were working from home during the Covid pandemic. A total of 300 teachers were mailed the online questionnaire, out of which 208 responses (response rate=69.33%) were found suitable for further analysis. The sample consisted of 115 males (55%) and 93 females (45%).

### Measures

#### **UWES 17 (Utrecht Work Engagement Scale)**

To assess the degree of work engagement, UWES (Utrecht Work Engagement Scale 17) designed by Schaufeli et al. (2004) was used. The instrument contains 3 scales: Vigor, dedication and absorption. Total score on engagement were calculated as suggested by Schaufeli and Baker (2004).

### Research objectives

The ongoing pandemic has temporarily resulted in online classrooms replacing the traditional classrooms and despite the obstacles, the teacher and the student; 'the key stakeholders in academic ecosystem' are trying their best to cope up with the challenge thrust upon them. The main objective of this research is to assess the employee engagement levels of teachers in higher education who are working from home. The following hypothesis was formulated for testing:

H0: Work engagement level of teachers is affected by quality of social support, organizational resources, health and family life.

## RESULTS

### Descriptive Statistics

Table 1:

Variable	Mean	Standard Error	Standard Deviation
Work Engagement	2.77	0.11	1.71
Gender	0.55	0.03	0.49
Personal Contact	5.67	0.18	2.66
Mental Health	0.53	0.03	0.49
Training	0.46	0.03	0.50
Entertainment	0.50	0.03	0.50
Virtual Teamwork	0.48	0.03	0.50
Number of Children	2.36	0.11	1.67

Source: Authors own findings

The descriptive statistics reveal that overall engagement levels of employees was very low ( $M=2.77$ ), based on the cutoff point set by the designers of the scale (Schaufeli et al., 2004). Over a past decade, research on work engagement has reported low engagement levels worldwide

(Shuck, Reio& Rocco, 2011) and some cross cultural studies too have revealed that engagement levels of Asians is less in comparison to westerners.

Table 2. Results from Multiple regression analysis

Method: Least Squares  
 Sample (adjusted): 208

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Sex	-2.47	0.25	9.67	0.0004
Salary	1.65	1.94	3.34	0.0169
Personal Contact	2.67	0.94	2.65	0.0457
Mental Health	0.79	0.62	2.24	0.0294
Virtual Tools	1.00	0.54	4.38	0.0046
Virtual Training	0.98	0.65	2.23	0.0668
Entertainment	0.43	0.14	0.55	0.5647
Virtual Team	0.56	0.10	0.84	0.4747
Marital	0.23	0.14	0.64	0.6477
Children	-0.65	0.88	-3.98	0.0074
C	8.76	8.37	5.01	0.0044
R-squared	0.62	Mean dependent var		517.86
Adjusted R-squared	0.60	S.D. dependent var		134.61
S.E. of regression	59.53	Akaike info criterion		11.11
Sum squared residual	170123.0	Schwarz criterion		11.33
Log likelihood	-294.11	Hannan-Quinn criter.		11.20
F-statistic	44.59	Durbin-Watson stat		0.43
Prob(F-statistic)	0.0003			

Source: Authors own findings

The multiple regression results revealed that gender is negatively associated with employee engagement which implied that male employees had less engagement scores than female. The reason might be because the male employees could not relate home as their place of work (Shuck, Reio& Rocco, 2011) in comparison to female employees. The association between salary and work engagement is positive which means that as the salary increases, the work engagement score increases. The results are consistent with a study conducted by Zeng, Zhou and Han (2009) in hotel industry which too showed that engagement scores of staff increases as the salary increases. The contact with the management i.e social support also significantly affects the engagement levels. Jenkins, S.,&Delbridge, R. (2013) found that organizations that focus on soft aspects like maintaining social relations had more engaged employees. The mental health variable is also significant related with work engagement and its positive association is validated by prior research conducted Schaufeli et al (2008) which proved that engaged employees enjoyed good mental health. The virtual trainings also had positive effect on employee engagement. This implies that if the organizations conduct virtual training for their employees at regular frequency, the employees reported higher engagement levels during works from home period. Work engagement is positively related with availability of emotional, psychological and physical resources which includes tangible resources like provisions of computers, internet and intangible like

provision of training and development opportunities (Shuck, Reio& Rocco, 2011). The regression analysis revealed that entertainment activities, virtual teamwork, and marital status employees has no significant effect on the employee engagement. Peng (2020) in a study among higher academic institutions too found no relationship between marital status and employees engagement. The number of children the couple had negatively affected the work engagement which may be due to the fact that the engagement levels of employees was low, it could have spilled over into their family live. Since role demands influence the task behavior of employees, work from home resulted in constant role conflicts and may have resulted in personal disengagement (Kahn, W.A., 2013). Thus, the hypothesis of the study was partially accepted.

The r-square and the adjusted r-square in the regression table show that the model is fit. The r-square is 0.62 which means that about 62% of the variation in the dependent variable is explained by the independent variables while the adjusted r –square is 0.60 which implies that about 60% of the variation in the dependent variable is explained by the independent variables. The p-value of 0.0003 entails that the model is significant at 1% level of significance.

## CONCLUSION

Descriptive analysis revealed that the total scores for work engagement of teachers were very low which may be due to role conflicts while performing multiple roles while working from home. The multiple regression models

revealed that social and organizational support as well as mental health positively affected the work engagement while family life (number of children) negatively impacted it. The inability to mobilize resources like technological support, internet connectivity especially during lockdown may be the major reason for negative relationship between family lives and work engagement (Eldor, L., 2016).

The present study provides an overview into the engagement levels of employees who are working from home during the pandemic. To improve the engagement levels, the organizations need to keep in mind that engaged employees perform well in resourceful jobs (Schaufeli, Taris, &Rhenen, W. 2008), hence the universities and colleges need to actively take measures to provide tangible as well as intangible resources to the faculty for successful implementation of digital education. Taking measures to improve engagement levels of teachers would be helpful in successful implementation of education reforms as engaged teachers are precursor to quality teaching and student satisfaction levels.

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## ASSESSMENT OF EMOTIONAL INTELLIGENCE AND ORGANIZATIONAL COMMITMENT: A SYSTEMATIC REVIEW

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### ABSTRACT

*Emotional intelligence is characterized as a capacity of the individual to control and measure his own emotion and the emotion of others. It plays an indispensable part in organizational productivity. The individual with high emotional intelligence shows an inspirational mentality towards the organization and emotional intelligence significantly impacts organizational commitment. The present study is based on previous literature and the objective of the study was to systematically review the relationship between emotional intelligence and organizational commitment. This research specifies the implications from the theoretical perspective. The reviewed studies pointed to positive associations between emotional intelligence and organizational commitment and highlighted several involved mechanisms. Besides, the study suggests that employers must consider workers emotional intelligence capabilities when making strategy and taking the decision as they correspond with organizational commitment. The findings of the study indicate the need of drawing in and utilizing highly emotionally intelligent people, training them in various levels and driving them towards the use of the abilities required.*

**Keywords:** Emotional Intelligence, Organizational Commitment, Systematic Review, Emotional Quotient

### INTRODUCTION

Commitment is a person's faithfulness towards the organization. A committed individual consistently plans to proceed with work with an organization and puts forth earnest attempts to accomplish its objectives. Unexpectedly, an uncommitted representative isn't roused towards the accomplishment of organizational objectives according to Kemp(1967). Affective commitment, continuance commitment, and normative commitment are three key aspects of commitment as per Meyer and Allen (1991). As per Alavi et al. (2013) organizational commitment is defined as a worker's positive or negative mentality towards the organization. Moreover, emotional intelligence is vital for a person's prosperity. Emotional intelligence is a sort of social intelligence empowering employees to control and classify their own emotions and that of others (Salovey and Mayer, 1990). It is an understanding of individual and others sentiments, and further to utilize them in the decision-making process as per Goleman (1998). Emotional intelligence is non-cognitive abilities, making a person more grounded against all internal and external components of pressure (Salkojani et al., 2012). Various researchers like Alavi et al. (2013); Moradi and Ardahaey (2011); Rathi and Rastogi, 2009; Goleman (1998) have set up the relationship of Emotional intelligence with Organizational commitment. While past research considers the relationship between emotional intelligence and organizational commitment, the present study offers insight through various perspectives on these two crucial constructs. Subsequently, the reasoning of the current exploration is to fill the gap by researching the

connection between Emotional intelligence and Organizational commitment.

### REVIEW OF LITERATURE

#### EMOTIONAL INTELLIGENCE

Emotional intelligence also known as Emotional quotient was first proposed by Salovey and Mayer (1990) as the capacity to evaluate and control one's and other's emotional feelings. The model had four principal perspectives to emotional intelligence like using emotions, recognizing emotions, regulating emotions and understanding emotions (Salovey and Mayer, 1990). Goleman (1995) described emotional intelligence as a potential factor to comprehend and predict the performance of workers in the working environment. This model had four bunches which is self-management, relationship management, self-awareness and social awareness.

As per Masrek et al., (2015) the employee commitment, recruitment, talent development, cooperation, and retention can be seen viably through the commitment of emotional intelligence in an organization. Emotional intelligence had a generally excellent effect upon organizational commitment, absenteeism, work pressure, job satisfaction and performance (Utami et al., 2014). Performance is a point of consideration for every organization which depends upon various factors (Singh, 2017; Singh and Dhaliwal, 2018; Singh and Bala, 2020). According to the statement by Moradi and Ardahaey, (2011) the centre of emotional intelligence is a term used to depict the mind-boggling capacity to direct our motivations, comprehend and share the feeling of others and have the option to

survive or recuperate rapidly from the troublesome condition. As indicated by the investigation of Utami et al., (2014), individuals with higher emotional intelligence had developed feelings, when contrasted with individuals with low emotional intelligence and then again individuals with high emotional intelligence can manage pressure, work-related issues effectively.

Emotional intelligence ordinarily is estimated by four factors such as Regulation of Emotion, Use of Emotion, Self-Emotion Appraisal and Others Emotions Appraisal. According to the statement by Tsai et al., (2011) it had been seen that individual with high emotional intelligence will comprehend and control the feeling of their own and others and it gives significant commitment to the efficiency of the working environment and execution of both the individual level and organization level. As per Cote, (2017) it isn't important to have a solid connection between an individual's psychological intelligence and his emotional intelligence even though a wide range of intelligence are identified with one another, therefore it is irrelevant to expect that people with high psychological intelligence have high emotional intelligence and the other way around. As per Yang et al., (2018) study based on 200 health professionals found that people with high emotional intelligence shows less pressure, higher organizational commitment than individuals who had low emotional intelligence.

### ORGANIZATIONAL COMMITMENT

Meyer and Allen (1997) conceptualized organizational commitment as organizational commitment is a mental expression that describes organizational individuals' relationship with the organization and has suggestions for the choice to precede or stop participation in the organization. As per Miller (2003) it is "a state where a worker relates to a specific organization & its objectives and wishes to keep up participation in the organization". Organizational commitment is divided into three dimensions normative, affective and continuance commitment. Normative commitment alludes to commitment dependent on a sense of obligation to the organization. Continuance commitment alludes to workers' appraisal of whether the expenses of leaving the organization are more prominent than the expenses of remaining. Affective commitment alludes to workers' identification with, emotional connection, and contribution to the organization. Workers with a solid emotional commitment stay with the organization since they want to (Meyer and Allen, 2007).

As per Mowday et al. (1982) organizational commitment has been utilized to infer three parts of staff perspectives that show the degree to which the workers exhibit a powerful urge to stay the individual from the organization, the level of readiness to apply a significant degree of endeavours for organization and conviction of acknowledgement of the actions, objectives and estimation of the organization. It alludes to a worker's confidence in

the organization's objectives and values, want to stay an individual from the organization and truthfulness to the organization (Mowday et al., 1982). Organizational commitment is a compelling reaction to the entire organization and the level of connection or faithfulness workers feel towards the organization. Indeed normative, affective and continuance commitment address mental states that have suggestions on whether a worker stays part of an organization. There is a need to comprehend a connection between people and organization as far as the theoretical structure of organizational commitment. Organizational commitment is generally portrayed in the administration and social sciences writing as a critical factor in the association between people and organization.

Organizations are ceaselessly overhauling their innovation, interaction and frameworks to adapt to challenging and rivalry environment. It is characterized as an individual ID and contribution in the organization portrayed by solid convictions and acknowledgement of the organization. While there is an understanding among researchers that the idea of organizational commitment shows the connection of a worker to an organization, there has been a discussion over the idea of organizational commitment. Commitment is the capacity of inalienable genuineness of a person, which builds up the ability to try sincerely and give great outcomes even in poor and unfriendly conditions. With regards to the current investigation, organizational commitment is viewed as a mentality, as it identifies with people's attitudes about the organization according to Allen and Meyer (1990).

### EMOTIONAL INTELLIGENCE EFFECT ON ORGANIZATIONAL COMMITMENT

Alavi et al., (2013) stated that the organization commitment can be depicted as the degree to which a worker's positive or negative mindset towards the organization as a whole and not the worker's particular job in that organization. As per Tsai and Tsao (2017) it is an instrument for workers to wish to remain and work in that organization. According to Shafiq and Rana (2016) emotional intelligence has a significant positive relationship with three dimensions of organization commitment (normative commitment, continuance commitment and affective commitment). Moradi and Ardahaey (2011) stated that workers with high emotional intelligence have high organizational commitment. According to Meyer and Allen (1991) normative commitment is an obligation to stay in an organization; affective commitment incorporates the agreed sensations of closeness and connection to the organization. The continuance commitment can be characterized as how much a worker's commitment towards the organization and continuance commitment is attained when an employee thinks of repercussions in terms of leaving an organization (Shafiq and Rana, 2016).

According to the statement by Tsai et al. (2011) at the workplace, a manager with high emotional intelligence will have high performance than a manager who has

lowemotional intelligence. One significant factor to accomplish the objectives is the motivation of employee, thus employees whose motivation level is high are more prepared and devoted to accomplishing the organizational objectives (Alavi et al., 2013). As per Nordin (2012) the commitment of workers to like to stay in the organization will be high only if the division heads or HR managers fulfil their necessities and it likewise portrays that emotionally intelligent academic staffs are the individuals who wish to remain with the organization and are committed to invest their maximum efforts. According to the study conducted by Khalid et al. (2018) the organizational commitment had a specific significance to health-related organization's efficiency and performance as happy nurses are more dedicated to their work and on the other hand non-attendance, complaints and turnover are the final product of nurses who were disappointed. Gelaidan et al. (2016) found that emotional intelligence had a huge impact on workers willingness for change and critically the organizational commitment.

Workers with high emotional intelligence can recognize and communicate their feelings; they have a better comprehension of their own feeling just as the feelings of others; they have a better capacity to manage both their good and bad feelings and others. The workers can adequately control the emotional conditions in the work environment, and they will be more dedicated to the organization. According to the statement by Abraham (2000) workers who have higher emotional intelligence will see their relationship with the organization as an expansion of their relationship with colleagues just as managers. Emotional intelligence plays a significant part according to the components that may impact the adequacy of the organization. Individuals who are emotionally intelligent are probably going to show a decent commitment, participation and imagination towards the organization according to Cherniss (2000). It was found that emotional intelligence significantly impacts organizational commitment based on data analysis. The outcomes support the hypothesis of emotional intelligence stated by Abraham (2000) that the workers who can handle their feelings in the work environment will be more dedicated to the organization. As per Cherniss (2000) the emotionally intelligent individuals are probably going to show a solid commitment to the organization. Wong (2002); Nikolaou and Tsaoousis (2002); and Anari (2012) findings also support the results.

## CONCLUSION

Emotional intelligence had a great effect on organizational commitment. The workers with high emotional intelligence will encounter high job satisfaction and that will prompt the best performance in the working environment. Emotional intelligence had a considerable positive relationship with three dimensions of organizational commitment which are normative, affective and continuance commitment. It is seen that individual with high emotional intelligence will comprehend and control their own emotion and others

emotion that gives crucial contribution to the efficiency of the work environment and furthermore with high emotional intelligence shows higher organizational commitment. Emotional intelligence consistently gives confidence and incorporates the nature of emotional strength which assists the person to adapt to interpersonal struggles. The workers who are emotionally intelligent are openly optimistic to divert their consideration from issue finding to problem-solving. It is suggested that emotional intelligence must be incorporated for the selection and recruitment level and also it will assist the organization with accomplishing its objectives and profitability.

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## DEEP LEARNING FOR DIGITAL PATHOLOGY USING REPRESENTATION LEARNING

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### ABSTRACT

*Disease diagnosis if made early and accurately will save lives. Pathologists manually diagnose diseases based on tissue samples. The diagnostic process is usually time-consuming and costly. As a result, automated tissue sample analysis from histopathology images is important for early diagnosis and treatment. The collection, management, exchange, and interpretation of pathology knowledge including slides and data in a digital environment is referred to as digital pathology. Digital pathology is a field that combines pathology and computers, and it has the potential to replace traditional microscope-based diagnosis soon. In this paper, a deep learning-based representation learning method for automatically classifying histopathological images is proposed. Two well-known and current pre-trained convolutional neural network (CNN) models, VGG-16, and Inception-v3, have been used for feature extraction. The VGG-16 and Inception-v3 pre-trained model were tested on the color images of the Kimia Path24 dataset. Additionally, to reduce the number of extracted features, a Principal Component Analysis (PCA) was done keeping in mind the future applicability of this proposed model in real life scenarios. According to the obtained results, it may be said that the proposed pre-trained models can be used for fast and accurate classification of histopathology images and assist pathologists in identifying some of the most critical and life-threatening diseases like cancer at an early stage and improve the chances of survival.*

**Keywords:** Deep Learning, Classification, Digital Pathology, Transfer Learning, Representation Learning, Convolution Neural Network

### 1. INTRODUCTION

The integration of algorithms for classification and retrieval in medical images through effective machine learning schemes is at the forefront of modern medicine[1]. These tasks are crucial as they are instrumental in detecting and analysing abnormalities and malignancies faster and allow well informed decision making on time. Digital pathology is an emerging area in the field of clinical diagnosis where faster decision making with the help of advanced machine learning algorithms can save lives [2]. As an age-old method of analysing tissue samples, the process of archiving microscopic information of specimens has been primarily achieved through the use and storing of glass slides[3]. Glass slides are not only fragile in nature, but hospitals and clinics need large and specially prepared storage rooms to store specimens. To store these specimens, special infrastructural enhancements need to be made so that the specimens are not destroyed.

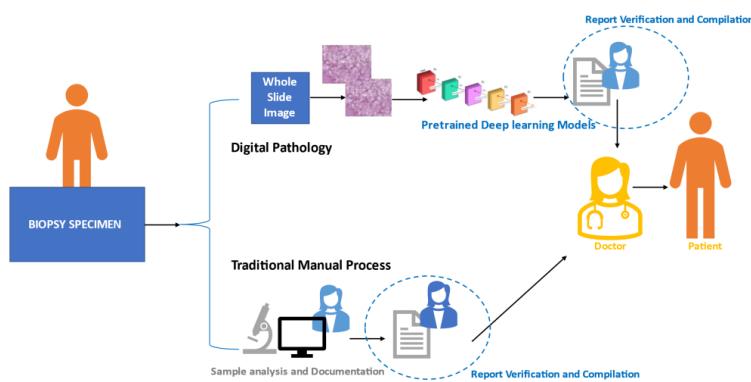
One of the most promising ways of overcoming the drawback of glass slides, is the use of Whole Slide imaging (WSI), also commonly known as digital pathology. WSI not only can preserve the quality of the image and prevent it from decaying but also has multiple other benefits[3, 4]. One of the most important aspects of digital pathology is it allows multiple experts to read, analyse the same images at

the same time, the whole process of studying the images can happen parallel between experts instead of following a sequential step which kills a lot of time and delays the process of disease identification.

Digital Pathology involves investigation of a biopsy or a surgical tissue specimen at microscopic level. These tissue samples are chemically processed and then sectioned on a glass slide for the study and analysis of cellular morphology mostly for cancer diagnosis. One of the steps involved in tissue segmentation so that it can be viewed under a microscope is to dye the tissue. One of more stains of Haematoxylin-Eosin and Immunohistochemical (IHC) is used for this purpose. The nuclei regions are stained in dark blue colour by Haematoxylin and the other structures like cytoplasm, stroma etc., are stained with pink colour. IHC is used to determine the cancer stage whether it is benign or malignant based on the presence or absence of proteins. After the process of staining, digital images are generated using fast slide scanners which contain one or multiple lenses to magnify the images at X20 or X40 magnification. Uniform light spectrum is used to illuminate the tissue slide. The slide scanners are provided with standard packages for corrections in spectral and spatial illumination variation. Lymphocyte is the white blood cell which plays major role in immune system of the body. Epithelial tissues line the outer surfaces of organs, blood vessels and inner

surfaces of cavities of human body. Lymphocyte Nuclei (LN) have regular shape and are smaller in size than Epithelial Nuclei (EN). EN's in high grade cancer tissues are larger in size and have clearly visible nucleoli. Also, they show heterogeneous chromatin distribution and irregular boundaries called nuclear pleomorphism. The

problems associated with detection, segmentation and classification of nuclei are due to variation in slide preparation, image acquisition like artifacts caused during image compression, noise etc., and the overlapping clusters of nuclei. The aspect of nuclei plays a major role in evaluating the existence of cancer and its severity.



**Figure 1.** Proposed Framework for Histopathological Image Classification

In 1999, Wetzel and Gilbertson developed the first automated WSI system[5], utilizing high resolution to enable pathologists to buffer through immaculate details presented through digitized pathology slides. Ever since, pathology bounded by WSI systems is emerging into an era of digital specialty, providing solutions for centralizing diagnostic solutions by improving the quality of diagnosis, patient safety, and economic concerns[6]. For larger size images, the parameters to be estimated, required computational power and memory also increase. Hence, the images must be resized to smaller images which results in loss of information at cellular level and there will be decrease of identification accuracy. Therefore, the entire Whole Slide Image (WSI) is divided into partial regions called patches and each patch is analysed independently. For increased patch sizes, the accuracy [7].

## II. LITERATURE SURVEY

The broad dimensionality of the image in digital pathology makes computation and storage difficult; thus, contextually understanding regions of interest in an image aids in faster diagnosis and identification by using soft-computing techniques[8]. Cell structures such as cell nuclei, glands, and lymphocytes are observed to have prominent characteristics that serve as a hallmark for detecting cancerous cells, particularly in histopathology. Researchers conclude that by correlating histological trends with protein and gene expression, conducting exploratory histopathology image analysis, and performing computer assisted diagnostics (CADx), pathologists will be able to make better decisions [9]. In recent years, WSI technology has been steadily establishing laboratory standards as a method of digitizing pathology slides for more effective diagnostic, educational, and research purposes[10]. The author of this paper[11] proposed the method of picture foreground extraction using a graph cuts based binarization, resulting in enhanced automatic detection and segmentation of cell nuclei. Multiple scale Laplacian of Gaussian

filtering was used to detect nuclear seed points, and a graph cuts-based algorithm is used for segmentation. Overall, the process achieved an accuracy of more than 86%.The authors of this paper[12] contrasted the classification of histopathological images using Local Binary Patterns (LBP), Bag-of-Visual (BOV) terms, and deep features. They presented a new dataset, KIMIA Path960, which contains 960 histopathological images from 20 different tissue types and demonstrated a deep feature recognition accuracy of 94.72%.Similar deep learning techniques for histopathological image classification and fusion of features when dataset is small to improve model accuracy is discussed in these papers [13][13][14]. Mitosis identification is critical for cancer grading and is one of the most significant factors in cancer prognosis. Authors of this paper[15] proposed a supervised model for detecting mitosis signature from histopathological images using deep learning. It includes five convolution layers, four max-pooling layers, four rectified linear units (ReLU), and two fully connected layers. Features such as morphological, textural, and intensity are all handcrafted and are incorporated. The method provides an efficient second opinion for breast cancer grading from whole slide images.

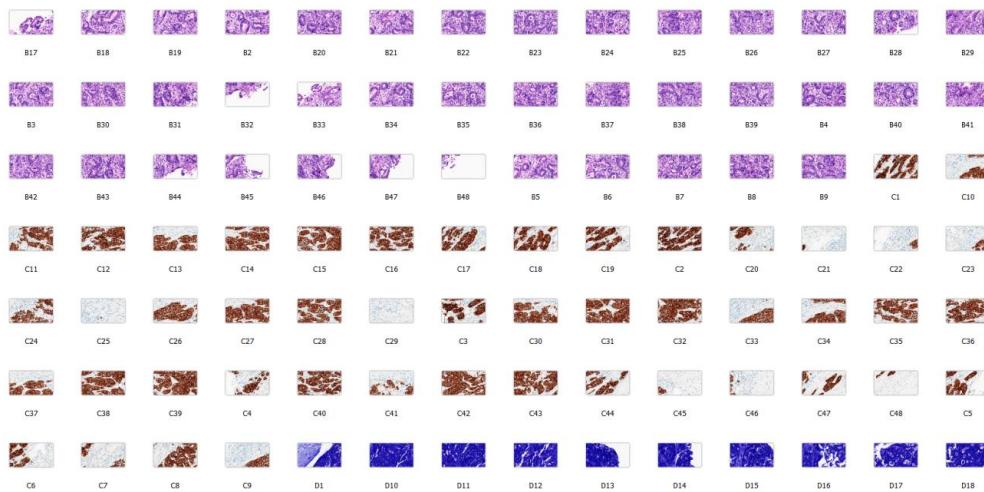
This paper found a large gap in faster classification and higher precision with restricted training image data. This substantial gap has been closed by representation learning. The findings are positive, and so far, they have shown improved classification.

## III. MATERIALS AND METHODS

Image segmentation is the problem of outlining relevant objects in images, the intent is to use the representation learning feature using ImageNet pretrained models to auto decide the feature selection that not only improves the model accuracy but also improves the model runtime. Representation learning is a technique that allows the algorithm to discover the representations needed for a feature detection or classification of raw data.The data set

used here is KIMIA Path960 which contain 960( $=20 \times 48$ ) images of manually selected 48 regions of interest. The

images were captured by Tissue Scope LE 1.0. The scans were done with a 0.75 NA lens in the bright region.



**Figure 2.** KIMIA Path960 Dataset – Sample View

### III A. Representation learning models

To provide preliminary results for setting a benchmark line for the proposed data set, we performed two sets of feature extraction experiments using the pretrained models of VGG-16 and Inception-v3. Following the feature selection process, a multilayer perceptron and SVM classifiers were used to compare results. To understand the applicability in real life scenario where the image numbers will be higher in number, prevent overfitting and to better generalize the model by producing independent, uncorrelated features PCA was applied on both VGG-16 and Inception-v3 features. After PCA a multilayer perceptron and SVM classifiers were used to compare results. All the models were evaluated using 10-fold cross validation technique as the dataset size is small and lacks variety of tissue images.

In all below experiments two classifiers namely neural network and SVM were used.

- Experiment 1: Auto extracted features using VGG16 pre trained model was used.
- Experiment 2: Auto extracted features using Inception-v3 pre trained model was used.
- Experiment 3: PCA was performed on the auto extracted features of VGG16.
- Experiment 4: PCA was performed on the Auto extracted features of Inception-v3.

### IV. RESULTS AND DISCUSSION

In this study two pretrained models namely VGG16 and Inception-v3 (which were trained on ImageNet dataset) were used to auto extract the features of Kimia Path960 dataset. All model results were computed using 10-fold cross validation.

Feature Extraction	Number of Features
VGG16	4096
Inception v3	2048
PCA on VGG16 Features	150
PCA on Inception v3 Features	150

**Table 1.** Details of feature dimension

### IV A. Experiment 1 (VGG16 auto features)

VGG16 auto extracted features were used to classify the images via neural network and SVM classifier. Both

$$\text{Accuracy} = \frac{(TP+TN)}{(TP+FP+FN+TN)} \quad (1)$$

Where, TP - True Positives, TN - True Negatives, FP - False Positives, FN - False Negatives

$$F1 Score = \frac{(2*(\text{Recall} * \text{Precision}))}{(\text{Recall} + \text{Precision})} \quad (2)$$

Where, Precision =  $\frac{TP}{TP+FP}$ , Recall =  $\frac{TP}{TP+FN}$

classifiers performed the same in terms of accuracy and F1 score.

Table 2 summarises the results of this experiment and supporting the claim that representation learning technique can yield improved classification accuracy.

Evaluation Metric	Neural Network	SVM
AUC	0.999	0.999
Accuracy	0.954	0.953
F1 Score	0.954	0.953
Precision	0.955	0.955
Recall	0.954	0.953

**Table 2.** Model Summary for VGG16 Feature Extraction

#### IV B. Experiment 2 (Inception v3 auto features)

Inception-v3 auto extracted features were used to classify the images via neural network and SVM classifier. Both

classifiers gave almost similar results in this case and the same can be seen in Table 3.

Evaluation Metric	Neural Network	SVM
AUC	0.999	0.999
Accuracy	0.955	0.947
F1 Score	0.955	0.947
Precision	0.956	0.948
Recall	0.955	0.947

**Table 3.** Model Summary for Inception v3 Feature Extraction

The model run time for experiments 1 and 2 were recorded and listed in table 4. Inception-v3 based models run ~80%

faster than VGG16 based models.

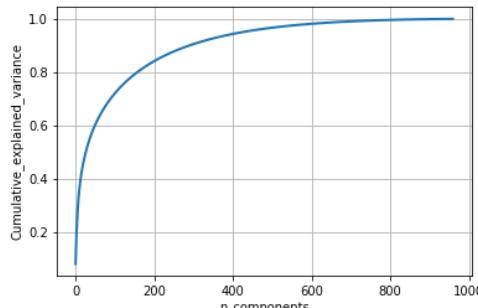
.Features	Classifier	Accuracy (%)	Number of Features	Run Time (mins)
VGG16	Neural Network	0.954	4096	22.7
VGG16	SVM	0.953	4096	22.3
Inception v3	Neural Network	0.955	2048	4.4
Inception v3	SVM	0.947	2048	3.5

**Table 4.** Model Runtime Summary for Auto Extracted Features

#### IV C. Experiment 3 (PCA on VGG16 auto features)

PCA was applied on VGG16 extracted features and from figure 3 it is evident that 150 Principal Components (PC)

were able to explain more than 80% variance. The model summary is presented in table 5 where SVM classifier gives better accuracy



**Figure 3:** Explained Variance vs Number of Principal Components (VGG16)

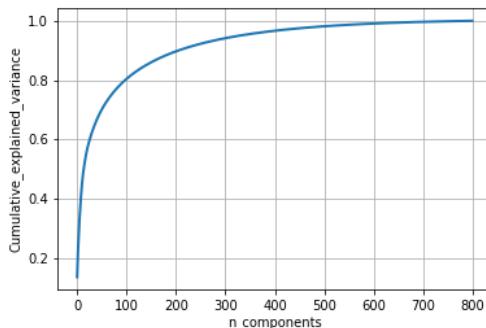
Evaluation Metric	Neural Network	SVM
AUC	0.985	0.994
Accuracy	0.863	0.903
F1 Score	0.856	0.904
Precision	0.865	0.909
Recall	0.863	0.903

**Table 5.** Model Summary for PCs of VGG16 Extracted Features

#### IV D. Experiment 4 (PCA on Inception v3 auto features)

PCA was performed on Inception-v3 auto extracted

features and like experiment 3, 150 PCs explained more than 80% variance.



**Figure 4:** Explained Variance vs Number of Principal Components (Inception-v3)

The model results were satisfactory, and PC's give better generalization which in turn helps prevent the model overfitting issue.

Evaluation Metric	Neural Network	SVM
AUC	0.996	0.999
Accuracy	0.906	0.948
F1	0.906	0.948
Precision	0.909	0.95
Recall	0.906	0.948

**Table 6.** Model Summary for PCs of Inception v3 Extracted Features.

The model run time for experiments 3 and 4 were recorded and listed in table 7. PCs of Inception-v3 based models run ~87% faster than PCs of VGG16 based models. SVM classifier on PCs of Inception-v3 auto features performs better in terms of both time and accuracy. SVM are known

to perform well when the number of features is less than the number of samples. ANNs can overfit if training samples are less - a problem that SVMs do not have. Hence SVM seem to perform better and also better generalizes the feature vector and thus the model.

Features	Classifier	Accuracy (%)	Number of Features	Run Time (mins)
PCA (VGG16)	Neural Network	0.863	150	18.5
PCA (VGG16)	SVM	0.903	150	18.3
PCA (Inception v3)	Neural Network	0.906	150	2.5
PCA (Inception v3)	SVM	0.948	150	2

**Table 7.** Model Runtime Summary for PCA

## V. CONCLUSIONS AND FUTURE SCOPE

As seen the above experiments, without any use of image preprocessing techniques and handcrafted feature selection, the Auto Feature selection process using pretrained models provide a higher level of accuracy. Also, when the dimensionality analysis is performed, the model runtime reduces further and the model accuracy with respect to Inception V3.0 remains above 90%. As a part of future scope of study, an appropriate image preprocessing technique can be evaluated which would enhance and blur certain parts of the WSI image based on the intensity of light. One of the experiments that can be explored along with the pretrained models is Trained Weka Segmentation technique as an image preprocessing step. This would not only reduce the time consumed in identifying the right handcrafted feature selection process but also positively impact the overall accuracy of the model. As a part of future scope, the efficacy of the preprocessing technique and pretrained models can be tested and a time comparison study can be performed by benchmarking the time spent in manually analyzing the glass slides by pathologists. As seen from the previous studies a considerable amount of time is spent in both manual as well as previous suggested machine learning models in data preparation and preprocessing steps. The future studies can focus on reducing the time spent and further improve the accuracy and model generalization for real time data.

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## A CRITICAL REVIEW OF THE APPLICATION OF MASLOW'S MOTIVATION THEORY IN INDUSTRY

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### ABSTRACT

*Entrepreneurship holds the key to the faster economic development of nations. India needs entrepreneurs of high caliber to realize Dr. Kalam's dream of a developed nation by 2020. Entrepreneurs are highly motivated individuals willing to take risks to achieve their entrepreneurial goals. There are many factors which motivate individuals to don the garb of an entrepreneur. Many of them start their enterprises for fulfilling a set of specific needs. This study aims to discover the motives for creating their enterprises, the needs satisfied through entrepreneurship and the level of satisfaction they enjoy through entrepreneurial activity.*

**Keywords:** Entrepreneurship, Motivation, Needs, Satisfaction, Achievement

### 1.

#### INTRODUCTION

Entrepreneurship is the purposeful activity of an individual or a group of associated individuals, undertaken to initiate, maintain or aggrandize profit by production or distribution of economic goods and services. Every entrepreneur independently or jointly with partners piece together the building blocks of industry land, labour, capital and organisation. It is the last one that cements the other three in any enterprise. The success of any enterprise is determined by the quality of the entrepreneur, who sets up and runs it.

However, the role of entrepreneurship in economic growth involves more than just increasing output or income per capita. It involves initiating and constituting changes in the structure of business as well as accelerating the generation, dissemination and application of innovative ideas, products and services. It expands the economic capacities of an economy and makes the marketplace more dynamic by creating an atmosphere of healthy competition among existing business entities. Entrepreneurship, because of its unique characteristics, plays an important socio economic role in employment generation, resource utilization and overall economic growth. The greater is the entrepreneurial activity of a nation, the faster is the growth of its economy. Entrepreneurial endeavours of a nation not only encourage existing business enterprises to become more entrepreneurial but such initiatives also provide the solution for various economic problems. Entry of new entrepreneurs enhances the economic capacities of an economy and makes the marketplace more dynamic and competitive. Entrepreneurship is an engine of economic growth and the advancement of any economy is dependent upon the intensity of the entrepreneurial initiatives taken by policy makers/bureaucrats. An institutional environment that encourages, nurtures and boosts entrepreneurship has the

potential of creating numerous employment opportunities, generate wealth for the economy and raise the overall standard of living.

#### 2. LITERATURE REVIEW

Entrepreneurs were called innovators with potentialities and the will to do new things, and economic leaders in the process of economic development, by Harbison in 1956 and Schumpeter. The function of an entrepreneur is to reform or revolutionize the pattern of production by exploiting new or untried technology and processes; as argued by Joseph Schumpeter in '*Can Capitalism Survive*'. The notion of the entrepreneur as an innovator is thus believed to have been conceived by Schumpeter. The neo classical economists defined entrepreneurship and entrepreneurs as the means or instruments by which the economy and society are transformed and improved (Schumpeter 1961).

The study by SIETI (Small Industries Extension Training Institute) Hyderabad (2014) probed the reasons for starting industrial units. The study revealed that the most important reason for starting the small industrial unit was "economic gains", followed by "ambition", "social prestige" and "social responsibility". However, the most encouraging factor had been, "high demand" for the product. Murthy (2009) stated that family and educational background influence a person only to the extent of setting up an industrial enterprise. The first to introduce the term entrepreneur in the sense of an individual engaged in production of goods for the market place was the French Economist Cantillon (Gupta 2010). This classical view was later supported by many social scientists. J.B. Say, the French Economist, emphasized the risk bearing factor, in his view of the entrepreneur as an 'Organizer' & 'Speculator'.

Needs are essentially certain deficiencies. The wish to fulfil them motivates an individual to activity. Thus, the behaviour of an individual at a particular moment is usually determined by the strongest need. Psychologists claim that needs have a certain priority. As the more basic needs are satisfied, an individual seeks to satisfy the higher needs. According to Maslow's Need Hierarchy Theory, human needs can be arranged in a hierarchical manner as follows - Physiological needs, Safety needs, Social needs, Ego needs & Self-actualisation needs.

### 3. RESEARCH OBJECTIVE

The objective of this research is to study the need satisfaction level among male entrepreneurs in Ludhiana district of Punjab.

### 4. METHODOLOGY

The study is descriptive in nature. The opinion of the entrepreneurs regarding various needs and the level of satisfaction pertaining to each is determined and analysed using statistical techniques.

#### 4.1 Universe and Sample

The universe of the study comprised of small scale ventures situated in Ludhiana district. It is not possible within the scope of study to include each and every entrepreneur from Ludhiana district. The sample consisted of 60 male entrepreneurs selected conveniently from different varieties of small scale ventures situated in Ludhiana district.

#### 4.2 Tools for Data Collection

The tool employed for data collection was a questionnaire having two parts: the first part designed to determine the demographic profile of the entrepreneur in relation to the various demographic factors and the second part, statements to evaluate the need satisfaction level.

The primary data were collected through questionnaires and interview schedules from 60 respondents. The study also made use of various types of secondary data including studies, reports and data collected by government and non-governmental organizations.

#### 4.3 Data Analysis - Tools

Statistical tools were used for analyzing the data.

### ANALYSIS OF DATA

#### FACTORS THAT IGNITED THE ENTREPRENEURIAL TALENT

Eleven factors, selected from a comparative study conducted among entrepreneurs by LouisdA Stevenson (1980) and the entrepreneurial factors put forth by Manuh and Brown (1987) were used for probing the entrepreneurial talent. These factors were ranked 1 to 11 by the respondents, based on the order of priority given to them while initiating the enterprise. The factors which obtained top 3 ranks are included in the 'High Preference Group'. Factors with the next four ranks are categorized as 'Medium Preference Group' and those with the remaining four ranks are considered in the 'Low Preference Group'. The available data are then analysed.

From the analysis it appears that majority of the entrepreneurs give high preference to taking up entrepreneurship as a 'means of livelihood' (76%), for 'progress in life' (73%) and due to the 'favourable environment'(50%). Thus, 'means of livelihood' and 'progress in life' appear to be the highly motivating factors that prompted them to enter into the field of entrepreneurship.

In the medium preference category most of the entrepreneurs include taking up entrepreneurship as an 'innovative activity' (60%), 'to gain control and respect in family' (57%), 'taking advantage of government assistance and facilities' (53%) and 'assuming responsibilities' (46%). Now, considering the low preference category, the entrepreneurs include factors like 'getting more freedom' (47%), 'proving one's abilities'(47%), 'taking it as a challenge or to fight a crisis' (67%) and as a 'leisure time activity' (77%).

**Table I: Average Scores Obtained For Various Factors by the Entrepreneurs**

Motivating Factors	Total Score	Avg. Score
Livelihood	584	9.73
Responsibility	308	5.13
Progress in life	572	9.53
Prove abilities	302	5.03
Challenge or Crisis	248	4.13
Favourable environment	456	7.6
More freedom	304	5.1
Control & respect	330	5.5
Innovation	340	5.67
Govt. assistance	316	5.27
Leisure time activity	166	2.77

(Source: Primary Data)

### **ANALYSIS ON THE BASIS OF AVERAGES:**

It can be observed from the table that high scores are obtained by the entrepreneurs for the two motivating factors: 'as a means of livelihood' and 'progress in life'. That means they give high preference to these factors. For 'means of livelihood', they obtained an average of 9.73 points while for 'progress in life', it is 9.53 points. But for motivating factors like 'assuming responsibility', 'proving abilities', and 'challenge or life crisis', the average scores obtained are 5.13 points, 5.03 points and 4.13 points, respectively. However, it is also a notable point that the scores obtained for the above 3 factors range from 4 to 7 points, which can be considered as a score indicating medium preference. Considering the factor, 'favourable environment', the entrepreneurs get 7.6 points. So, a higher preference is given to this factor by them. But, for the motivating factor 'obtaining freedom', the average score is only 5.1 points.

For the motivating factor 'gaining control and respect', they get 5.5 points, which can be included in the category of medium preference and for 'innovation' they score 5.67 points. Now considering the motivating factor 'government assistance and facilities', they get 5.27 points as an average, which may again be considered as medium preference. But, a different view can be observed for the motivating factor, 'as a leisure time activity'; here they score only 2.77. The above findings reiterate the previous observations on the preferences given to the various motivating factors.

### **NEEDS SATISFIED THROUGH THE ENTERPRISE**

The researcher then sought to study to what extent the entrepreneurs have satisfied various needs. Needs are essentially certain deficiencies. The wish to fulfil them motivates a person to activity. Thus, the behavior of an individual at a particular moment is usually determined by his strongest need. Psychologists claim that needs have a certain priority. As the more basic needs are satisfied, an individual seeks to satisfy needs belonging to the next priority level. According to Maslow's Hierarchy of Needs Theory, human needs can be arranged in a hierarchical

manner as follows - Physiological needs, Safety needs, Social needs, Ego needs and Self-actualisation needs.

However, it is generally not easy to say which of the needs are important at a particular point of time and place. A number of researches on the topic pointed out that there is no rigid hierarchical structure as pointed out by Maslow. But everyone agrees that every individual has some order for his need satisfaction. This order may not follow Maslow's Hierarchy of Needs. Another problem in applying Maslow's Theory into practice is that a person tries for his high priority need when his low priority need is reasonably satisfied. But, the reasonable level of satisfaction for particular need may differ from person to person.

### **A STUDY OF THE EXTENT TO WHICH THE ENTREPRENEURS HAVE SATISFIED THE VARIOUS NEEDS**

The various needs analysed under this study have been selected from Maslow's Hierarchy of Needs Theory. Each need in the hierarchy has been measured separately. The response to various needs has been analysed through 24 statements. These statements are rated on a 5 point scale ranging from strongly agree to strongly disagree. Thus, the maximum score that may be obtained by a respondent for a particular statement is 5 points and the minimum is 1 point. However, the total score that may be obtained for a particular need by a respondent depends on the number of statements assigned to that statement. The score obtained by a particular respondent, for a particular need, determines the extent to which his need is satisfied. For this purpose the percentiles,  $P_{33}$  and  $P_{66}$ , have been determined for each need. Then, based on the percentiles the scores obtained by the respondents have been assessed as high, medium or low scores.

The respondents getting a high score (i.e. above  $P_{66}$ ) for a particular need is considered as getting high satisfaction of that need from their concern. Moderate satisfaction is received by those entrepreneurs who attain a medium score (i.e. between  $P_{33}$  and  $P_{66}$ ). Those who get only a low score (i.e., below  $P_{33}$ ) is considered in the low satisfaction group.

**Table 2 :Categorisation of the Entrepreneurs Into High, Medium And Low Satisfaction Groups**

	Needs	Physiological	Safety	Social	Ego	Self- actualisation
High Score	F	22	26	22	30	32
	%	37	43	37	50	53
Med. Score	F	24	18	20	18	12
	%	40	30	33	30	20
Low Score	F	14	16	18	12	16
	%	23	27	30	20	27
Avg of Total Score		14.1	17.6	15	19.6	20.8

(Source: Primary Data)

## PHYSIOLOGICAL NEEDS

The total score of the statements given to analyse physiological needs falls in the range '4 to 20 points'. The  $P_{33}$  and  $P_{66}$  calculated respectively are 13 & 1. On examining the data given in table for physiological needs, it is observed that only 37% of the entrepreneurs are highly satisfied in this respect, while 40% of the entrepreneurs obtained medium scores. However, the proportion of entrepreneurs who have only low satisfaction of physiological needs from their concerns is only 23%. Thus most of the entrepreneurs get only moderate satisfaction of their physiological needs. Now, analysing the average of total scores obtained for the 4 statements, it is seen that the average score obtained is 14.1 points, which also indicates that physiological needs of the entrepreneurs are only moderately satisfied through their enterprises.

## SAFETY NEEDS/SECURITY NEEDS

A respondent's total score for the safety needs falls in the range of '5 to 25 points'.  $P_{33}$  and  $P_{66}$  computed are 16 and 20 respectively. Scrutinizing the figures of safety needs, it is evident that safety needs of 43% of the entrepreneurs are highly satisfied through their enterprises, while 30% the entrepreneurs have moderate satisfaction of safety needs; only 27% of them have low satisfaction in this regard. Thus a majority of the entrepreneurs have high or medium satisfaction as regards their safety needs is concerned. For this need, the average score obtained by the entrepreneurs is 17.6 points, indicating moderate satisfaction.

## SOCIAL NEEDS

The maximum score obtainable for social needs is 20 and the minimum score is 4.  $P_{33}$  and  $P_{66}$  determined are, 15 & 17 respectively. From the table, it appears that high satisfaction of social needs is achieved by 37% of the entrepreneurs. 33% of them fall in the medium satisfaction

group and 30%, in the low satisfaction group. So, it is clear that the entrepreneurs are not that satisfied with regard to social needs. However, the average score shows a different picture. The average score obtained by the entrepreneurs for social needs is 15 points, indicating medium satisfaction.

## EGO NEEDS

For ego needs, a respondent can earn a maximum score of 25 points and a minimum of 5 points.  $P_{33}$  and  $P_{66}$  are found to be 18 points and 21 points respectively. Studying the details of ego needs in the table, we can observe that about 50% of the entrepreneurs get high satisfaction in respect of ego needs. Only 30% of them are included in the group of medium satisfaction. However, 20% of the entrepreneurs have only low satisfaction. Thus, it is evident that majority of the entrepreneurs get high satisfaction of their ego needs. The average of 19.6 points for the ego need is in the range of medium score (i.e., 18 to 21 points). So we may conclude that the ego needs of the entrepreneurs are moderately satisfied.

## SELF-ACTUALISATION NEEDS

For self-actualization needs, a respondent's score falls in between 6 points and 30 points.  $P_{33}$  and  $P_{66}$  are 20 & 22, respectively. Considering the self-actualization needs, some variation is observed in the proportion of the entrepreneurs in the different satisfaction groups. While self-actualisation needs of 53% of the entrepreneurs are highly satisfied through their enterprises, 20% get only moderate satisfaction. 27% of the entrepreneurs have only low satisfaction. The average score obtained for self-actualisation need is 20.8, which is in the medium range (i.e., between  $P_{33}$  and  $P_{66}$ ). So, in the case of self-actualisation needs also, the extent of satisfaction is neither too high nor too low.

**Table 3: Hierarchy of Needs Satisfied (Ranks Given To The Needs) by the Entrepreneurs**

Needs	Mean Score	Rank
Physiological	3.53	3
Safety	3.52	4
Social	3.75	2
Ego	3.93	1
Self-actualisation	3.47	5

(Source: Primary Data)

A close scrutiny of the mean scores of the five needs reveals the order in which they are placed in the hierarchy of needs on the basis of the level of satisfaction. The prime position is taken by 'ego needs', followed by 'social needs', 'physiological need', 'safety needs' and 'self-actualisation needs'.

## CONCLUSIONS

It can be concluded on the basis of the present study that 'means of livelihood' and 'progress in life' appear to be the highly motivating factors that prompted the entrepreneurs to enter into the field of entrepreneurship. 'Favourable

environment' is also a major factor influencing the level of entrepreneurial activity. More than half of the entrepreneurs get a high satisfaction of their 'ego' and 'self-actualisation' needs. "Safety" needs also account for a comparatively higher level of satisfaction. The respondents' choice of the hierarchy of needs on the basis of their satisfaction is 'ego needs', 'social needs', 'physiological need', 'safety needs' and 'self-actualisation needs'.

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## WATER RESOURCE MANAGEMENT AND SUSTAINABLE DEVELOPMENT IN INDIA: AN OVERVIEW

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### ABSTRACT

*India's, water resources and water economy system largely determinants its socio-economic sustainable development. Water resource and water sustainability for future generations, Water and environment security, public access to clean water, the reliability and sustainability of water supplies for meeting the economy's needs, the condition of water bodies and water resources, and the ability to forecast and prevent the damage wrought by water-caused emergencies, all play a large part in any state's national security. Water resources are national assets and natural resources. It is the quantitative and qualitative changes in the country. At the present time, 76 percent of the total population has a specific water availability of fewer than 5.0 thousand M<sup>3</sup> per year per capita, with 35 percent having very low or catastrophically low water supplies. This situation will deteriorate further at the beginning of the next century; in 2025 most of the earth's population will be living under the commodity of low or catastrophically low water supply. This paper discusses in detail the concepts of water resources and sustainable development along with water resources, various sectors, and also the current position of water resources in India.*

**Keywords:** Water resources, Sustainable development, water measurement, Water requirement.

### INTRODUCTION

In a nation, water resources and water economy systems largely determinants its socio-economic sustainable development, Water resource, and water sustainability for future generations, Water, and environmental security. public access to clean water, the reliability and sustainability of water supplies for meeting the economy's needs, the condition of water bodies and water resources, and the ability to forecast and prevent the damage wrought by water-caused emergencies, all play a large part in any state's national security.

India occupies 02 percent of the world's land area, represents 16 percent of the world's population and 15 percent of livestock, whereas it has only 4 percent of the water resources of the world. Furthermore, India ranks 133rd out of 180 nations for its water availability and 120th out of 122 nations for its water quality. It has been evaluated that 80 percent of India's surface is polluted which results in India losing US\$ 13 billion every year due to water-related diseases. Challenges faced by the Indian water sector are due to increasing water consumption and wastage in urban areas, water-borne diseases, industrial growth, political and regulatory disputes, water cycle imbalances, increasing irrigation and agricultural demand, lack of technology, etc. According to estimates, India's water sector requires investment worth US413 billion.

According to the central water commission 2014, India has 1.123 billion cubic meters (BCM) of usable water resources

available to itself every year, out of which 690 BCM comes from surface water resource and 433 BCM comes from groundwater. The country blessed with significant water resources potential-indeed, water resources of the country increases agriculture productivity, Industrial production, poverty eradication, increasing income, good health human development. Water resources have a special role in the development of the national economy and support for the social and economic programs in country regions.

### REVIEW OF LITERATURE

A general review of literature of the period shows that the researchers were very much interested water resource management and sustainable development on different aspects. The study attempts to focus a few relevant studies for this analysis.

GayathriUnnikrisnan(2016) in his stated that the sustainability of water resources will determine the well-being of people in the long run. Here, an attempt was made to understand the condition of water resources and sustainable development in the Indian state of Kerala. It was recognized that serious and sincere measures are required to conserve the water resources in terms of both quantity and quality.

Jeffrey Love and Vince Luchisinger(2014) carried out a study on "Sustainability and Water resources", this paper focuses on environmental concerns in regards to sustainability, particularly water, and there are other areas

or topics that are also in need of attention when talking about sustainability.

R.Warren Flint (2004) in his opinion that water crisis in the world is due essentially to the unsustainable use and management of water resources and to the distribution of ecosystems such as forests, wetlands, and soil that capture, filter, store and release water. Through our evaluation of water resource sustainability, we must not only increase public awareness about the challenges the world is facing in relation to water, but we must also change the way the water issue is perceived; from being a driver of conflict to being a catalyst for collaboration. In doing so, we must not only view sustainability as a problem of science, engineering, or economics; but it is also founded on values, ethics, and the equal contributions of different cultures.

Rob Koudstaal, *et al.* (1992) examined the water resources should be managed as an integral part of a nation's social and economic development. Water resources managers should broaden their scope of work to include an integrated management approach. Instead of the traditional 'supply oriented approach' in which they act in response to ever-increasing demands for water from different sectors of the economy, water resources management agencies should play a more active role in guiding and stimulating socio-economic development through more efficient water use.

## OBJECTIVES

The present objectives of the study on the research article: are

1. To study of water resources in India
2. To analyze that sustainable development and water resources in India
3. To examine the water requirement and sectorial wise measurement in India.

## METHODOLOGY

The present study is based on secondary sources of information. The secondary sources of information gathered through journal articles, volumes, periodicals, government reports and websites.

## LIMITATION OF RESEARCH

The paper consists of the study in four sections. The present section introduces various facets of the study in the form of discussing the issues, objectives, methodology, and sources of data collection. The second section focuses on the various studies on water resources and sustainable development with the country. The third section is the water requirement and sectoral wise development in India. Findings, suggestions, conclusions are discussed in the fourth section and also summarizes the findings in a nutshell and mentions and scope and habit of further research in this field of inquiry and the limitation of the study.'

## WATER RESOURCES

Water resources have been described as a critical resource that underpins economic growth, underpins social development, and obviously underpins environmental protection of the present and future. (Heimbuch, 2010; Jeffrey Love, and Vince Luchsinger;2014). At the present time, 76 percent of the total population has a specific water availability of fewer than 5.0 thousand M3 per year per capita, with 35 percent having very low or catastrophically low water supplies. This situation will deteriorate further at the beginning of the next century; in 2025 most of the earth's population will be living under the commodity of low or catastrophically low water supply.

According to Irina Bokova, Director of General UNESCO, in an Official statement 'Water resources are a key element in policies combat poverty, but are sometimes themselves threatened by development. Water directly influences our future, so we need to change the way we assess, manage, and use this resource in the face of ever-rising demand and the overexploitation of our groundwater resources".

According to Ban Ki Moon, Secretary General, United Nations, WorldWater Day official statement, (2013) "Water holds the key to sustainable Development, we must work together to protect and carefully manage this fragile, finite resource".

## SUSTAINABLE DEVELOPMENT

In its 1987 report, our Common Future, the United Nations world commission on environment and development (brundtland Commission) regarding that 'sustainable development' as "Developmentthat meets the needs of the present without compromising the ability of future generations to meet their own needs".

The concept of sustainable development approved at the UN conference on environment development in Rio de Janeiro in 1992, has become majorstrategy for most countries. It is aimed at improving human life while preserving the environmental potential and allowing careful use of natural resources. Sustainable development can be achieving by introducing progressive nature and energy preserving technologies, while not depleting resources and not pointing the environment.

## WATER RESOURCES AND SUSTAINABLE DEVELOPMENT

University of Maryland School of Public Policy professor and Former Chief Economist of the World bank Herman E,Daly Suggests the following three operational rules defining the condition of ecological sustainability:

1. Renewable resources such as fish, soil, and ground water must be used no faster than the rate at which regenerate.
2. Nonrenewable resources such as minerals and fossil fuels must be used no faster than renewable substitutes for them can be put into place.

3. Pollution and wastes must be emitted no faster than natural systems can absorb them, recycle them, or render them harmless.

One way to implement these rules is to consider how the use of renewable resources can be compared to the rate of renewal, as follows:

Consumption of renewable resources	State of environment	Sustainability
More than nature's ability to replenish	Environmental degradation	Not sustainable
Equal to nature's ability to replenish	Environmental Equilibrium	Steady-state sustainability
Less than nature's ability to replenish	Environmental renewal	Sustainable development

**Source:** Ethan Timothy Smith(2010) Water Resource Sustainability, Watershed Update, Vol.8, No.1, PP.2.

At the start of the new millennium the most highly developed countries have succeeded in stabilizing the ecological situation. This has been achieved through intense promotion of scientific and technical advances.. Most other countries are presiding with their wasteful extensive exploitation and sale of natural resources.

#### **MEASURES FOR WATER RESOURCES AND SUSTAINABLE DEVELOPMENTIN INDIA**

The urgency of channeling more effort towards monitoring and reporting this aspect of water sustainability is heightened by the wide coverage of water infrastructure related Sustainable development Goals. A holistic approach to measure the quality of water infrastructure in line within national and rural water resource objectives linked to widening access to clean water resource and sanitation. Furthermore, demand on water infrastructure in India is set to increase, driven chiefly by rising domestic demand for rice, wheat and sugar within Indians rising population and shifting dietary trends towards middle class diets. There

will be Prospects of widening gaps between demand and supply within Indians most populous water basins – the Ganga, the Krishna, and Indus by 2030 underpins the need for robust monitoring and reporting of the ability of Indians water resource infrastructure to effectively respond to future. Lastly our analysis of the state of corporate government water resource reporting in India highlights a lack of temporal measurement of water resource sustainability Indian's water economy.

The framework for water resources present status of sustainable development shows how water policy is linked to policies in other sectors including agriculture, industrial, ecological and energy, health, transportation. The average annual water availability of region or country is largely dependent upon hydro-metrical and geological factors and generally constant. The average annual per capita water availability in the year 2001 and 2011 was assessed as 1820 cubic meters and 1545 respectively which may reduce further to 1341 and 1140 in the years 2025 and 2050 respectively.

**Table: 1, Estimates of Water resources in India**

Estimating agency	Estimate in BCM
First Irrigation Commission(1902-03)	1443
A.N.Khosla (1949)	1673
Central Water Power Commission(1954-66)	1881
National Commission on Agriculture	1850
Central Water Commission (1988)	1880
Central Water Commission(1993)	1869

**\*BCM=Billion Cubic Metre**

**Source:** Government of India, Planning Commission, Eleventh Five Year Plan (2007-2012), Volume III,p.44. and Dr.Chandra Shekhar Prasad and Dr.HimanshuShekhar(2013) Sixth Five Years of the Indian Economy 1947-48 to 2012-13, New Century Publications, New Delhi, P.82.

Water resources in the country: as per assessment done by CWC in the year 2019, the average annual water resource of the river basins of India for the study period of 30years (1985-2015) has been assessed as 1999.20 BCM. The mean annual rainfall of the basins for the study period of 30 years is 3880 BCM. It is estimated of that owing to topographic,

hydrological and other constraints;the utilizable water with conventional approach is 1137 BCM which comprises of 690 BCM of replenish able ground water resources.

#### **PROJECTIONS OF WATER REQUIREMENTS OF VARIOUS SECTORS OF THE INDIAN ECONOMY**

The projections of water requirement of various sectors of the Indian economy periods. The estimates sectors of two Committees, Standing Sub-committee of Ministry of water resource and National Commission on Integrated Water Resource Development. Estimates of the sectors irrigation, drinking water, Industry, Energy and others sectors

**Table: 2**

**Standing Sub-Committee of Ministry of Water Resources Estimate Report**

Water Demand in Km <sup>3</sup> ( or BCM) <sup>1</sup>						
Year	Irrigation	Drinking water	Industry	Energy	Others	Total
2010	688 (85%)	56 (7%)	12 (1%)	5 (1%)	52 (6%)	813 (100%)
2025	910 (83%)	73 (7%)	23 (2%)	15 (1%)	72 (7%)	1093 (100%)
2050	1072 (74%)	102 (7%)	63 (4%)	130 (9%)	80 (6%)	1447 (100%)

**Billion Cubic Meter(BCM)<sup>1</sup>**

**Source:** Government of India, Planning Commission, Eleventh Five Year Plan (2007-12), Volume. III, P.46.

It can be observed from the table, 2 details of projections of water requirements of various sectors of the Indian economy. Standing Sub-Committee of the Ministry of Water Resources<sup>2</sup>, Estimate Report Water demand in Km<sup>3</sup> (or BCM) such as Irrigation, Drinking water, Industry, Energy and others estimated period from 2010 to 2050. Irrigation was estimated at 85 per cent in 2010. Whichever estimates have been 83 and 74 per cent future estimate year in the 2025 and 2050 respectively? Similarly, the drinking

water resource sector was 7 per cent in the year 2010 which has constant 7 per cent the same 2025 and 2050 respectively. Further, The energy Sector estimate committee was 1 per cent in the year 2010 and 1 per cent from 9 per cent increased rapidly estimate from 2025 to 2050, respectively. Therefore, the other sectors estimate report was 6 per cent in the 2010 and future estimate have 7 per cent to 6 per cent will be decline from 2025 to 2050 respectively

**Table: 3**

**National Commission on Integrated Water Resources Development estimate Report**

NCIWRD Water Demand in Km <sup>3</sup> ( or BCM) <sup>1</sup>						
Years	Irrigation	Drinking water	Industry	Energy	Others	Total
2010	557 (78%)	43 (6%)	37 (5%)	19 (3%)	54 (8%)	710 (100%)
2025	611 (72)	62 (7)	67 (8%)	33 (4%)	70 (8%)	843 (100%)
2050	807 (68%)	111 (9%)	81 (7%)	70 (6%)	111 (9%)	1180 (100%)

**Billion Cubic Metre(BCM)<sup>1</sup>**

**Source:** Government of India, Planning Commission, Eleventh Five Year Plan (2007-12), Volume. III, P.46.

From the table -3, it's clear that the projections of water requirements of various sectors of the Indian economy. National commission on integrated water resources water demand estimate from 2010 to 2050. The irrigation sectors water resource demand in Kiloliter (or BCM) was 78 per cent in the year 2010, which declined water demand estimation 72 per cent in the year 2025 and 68 per cent 2050. The drinking water resource was 6 per cent in the estimation year 2010. This increased from 7 and 9 per cent in the year 2025 and 2050 respectively. Similarly, the energy sectors water demand estimate was 3 per cent in the year 2010. This will be increased by 4 and 6 per cent in the periods 2025 and 2050. The other sectors water demand estimate was 8 per cent in the year 2010. Whichever estimate 8 per cent constant will be increased 2025 and 2050 respectively.

### FINDINGS

From the about Discussion some of the important findings have been listed as fellows.

- ✓ The water resource is abundant in India and is being used efficiently

- ✓ In India, there are various faced by the challenges in the water resource sector. In due to increasing water consumption and wastage in urban areas, water-borne disease, Industrial growth, political and regulatory dispute, water cycle imbalances, increasing irrigation and agriculture demand, lack of technology, etc.

### SUGGESTIONS

The following suggestions could be made from the suggestions of the study.

- ✓ There is a need to improve water resource incentive programs effectively and efficiently in sustainable development.
- ✓ There is a need the active participation of NGOs and Government by the involvement of awareness of water resources programs rural and urban areas.

### CONCLUSION

Inspire of these efforts "water for all" remains an unfulfilled agenda of the government of India and state government. The existing water system effectively meets the water needs of the economy and the inhabitants. Water

is an inseparable natural resource on this earth. There should be a precedence to preserve water resources. The sustainability of water resources will determine the wellbeing of people in the long run. Further, an attempt was made to understand the condition of water resources and sustainable development in India. It was to identify that serious and truth full dimensions are required to conserve the water resources in terms of quantity and quality.

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## CAUSALITY AMONG BANKING STOCK PRICES AND MACRO ECONOMIC VARIABLES IN INDIA: A POST 2008 SUB-PRIME LENDING CRISIS SCENARIO

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### ABSTRACT

*Recent developments such as depreciation of Indian Rupee against US Dollar, demonetization adversely impacting money supply, reductions in interest rates etc. have the potential to alter the previously established relationship of stock prices with macroeconomic variables. The aim of the study is to examine the causal relationship between Indian banking stock prices and macroeconomic variables such as industrial production, inflation, money supply, exchange rate and interest rate. The study considers monthly time series data from April 2009 to March 2018 i.e. the period post sub-prime lending crisis to identify significant relationships. The study applies ADF, PP and KPSS tests to find presence of unit root in data series at level but stationary at first difference. The study thus applies Granger's causality test on the first differenced variables and found strong unidirectional relationship from banking stock prices to exchange rate and two weak unidirectional causal relationships from stock prices to interest rates and from inflation towards stock prices.*

**Keywords:** stock prices, macroeconomic variables, unit-root, Granger causality

### INTRODUCTION

The factors impacting the profitability of banks can be broadly categorized as internal and external. Internal factors include size of the bank, government ownership, deposits & advances, non-performing assets, interest rate spread, operating efficiency, provision for credit losses, non-interest expenses, commissions & fees among others. External factors on the other hand comprise industry (competitors, technology, taxation etc.) as well as macroeconomic variables (gross domestic product, inflation, interest rates, money supply, foreign exchange rate etc.). As stock prices reflects the current value of all the future dividends derived from profits, these factors impact stock prices by altering these future cash flows. Of all the factors impacting stock prices of banks, macroeconomic variables is of great interest to researchers. Although several studies conducted in the past have focussed on developing the relationship between macroeconomic variables and stock prices, very few have attempted to determine the causal relationship with industry specific stocks. Moreover, most of the studies have also not taken the impact of sub-prime lending crisis event of 2008 into account. Therefore, the goal of the present study is to identify the causal relationship between banking stock prices in India and five macroeconomic variables including industrial production, inflation, money supply, exchange rate and interest rate over a period of 9 years from April 2009 to March 2018. The results of the study shall increase the available literature as well as provide recommendations for policy makers, investors and academicians.

### LITERATURE REVIEW

Gunasekarage et al. (2004) also examined the causal relationship between macroeconomic variables (money supply, Treasury bill rate, consumer price inflation, exchange rate and US price index) with stock prices in Sri Lanka. The study found that there is significant impact of lagged values of consumer price inflation, money supply and Treasury bill on the Sri Lanka stock market. Bhattacharya and Mukherjee (2006) examined the causal relationship among stock prices in India and five macroeconomic variables. These macroeconomic variables were index of industrial production, money supply, national income, interest rate and inflation rate. They used monthly data from 1992 to 2001. The results of the study revealed and explained the existence of bidirectional causality between stock prices and inflation. Barbic and Jurkic (2011) conducted their study in selected CEE countries (Croatia, Czech Republic, Hungary, Poland and Slovenia) using Granger causality test. The study used inflation rate, broad money supply, money market interest rate and foreign currency reserves as crucial macroeconomic variables. The study depicted that money supply as well as foreign exchange lead stock prices in Czech Republic. Inflation as well as money market interest rate lead stock prices in Slovenia, whereas stock prices lead money market interest rate in Hungary and Czech Republic, foreign exchange reserves in Slovenia and money supply in Poland. Naik and Padhi (2012) analysed the short and long-run causal relationship between the Indian stock market and macroeconomic variables by using data from April 1994 to

June 2011. As per Granger causality analysis, the study determined bidirectional causality between IIP and stock prices whereas unidirectional causalities from stock prices to WPI, money supply to stock prices, stock prices to exchange rate and Treasury bill rate to stock prices. Dey (2013) examined the relationship of foreign exchange rates & foreign exchange reserve with stock prices (S&P BSE Sensex) in India using monthly frequency data from March 1992 to June 2012. The study employed Granger causality test and confirmed the presence of unidirectional causality from foreign exchange rate towards stock prices. Bhuvaneshwari and Ramya (2017) examined the causality between stock prices and exchange rate in India by taking monthly data from January 2006 to December 2015. They analysed unit roots in the data set using ADF and PP tests and found data to be non-stationary at level and integrated of the first order. Using Granger causality test, the study found evidence of bi-directional causality between exchange rate and stock prices in India.

## RESEARCH METHODOLOGY

**Objective of the Study**—To identify the Granger causal relationship between banking stock prices in India and macroeconomic variables.

**Variables** — The study selected five macroeconomic variables viz. industrial production, rate of inflation, money supply, interest rate and exchange rate as independent variables. Construction of variables involves the selection of proxies to be used for variables. For instance, money supply is one variable but proxy for the same needs to be chosen from M1, M2, M3 or M4 depending upon the objectives of the study as well as previous literature. Data consistency is another factor to be considered while selecting proxies for variables. The study used index of industrial production, wholesale price inflation, broad money supply, foreign exchange of India Rupee per US dollar and call money rate as proxies for above variables.

**Data Period** - Selection of period of data to be considered for the study involves choosing frequency as well as duration of data. As the data for variables mentioned above is released on monthly basis, the study considered monthly data of all variables from the period April 2009 to March 2018 i.e. the period post subprime lending financial crisis.

**Tools of Analysis** — The study employs descriptive analysis (mean, median, maximum, minimum, standard deviation, skewness, kurtosis etc.) to understand the general trend in variables. Unit root tests viz. Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) are applied to analyze the stationarity of data. If variables have unit root at level but become stationary (no unit root) at first difference, then there might exist co-integration among them and thus causal linkage can be explored using Granger causality test. Developed by Granger in 1960, the study applies Granger causality test to check the existence and direction of causality between non-cointegrated variables (Granger, 1969).

## RESULTS AND DISCUSSION

**Descriptive Analysis** — A wide difference between the minimum and maximum values of the variables is seen suggesting that the value for the variables have been fluctuating during the period considered i.e. April 2009 to March 2018. Index of industrial production (0.210), broad money supply (0.067) and BSE Bankex (0.613) are found to be positively skewed while rest of the variables are found to be negatively skewed. With respect to the curvature of data series, all variables except call money rate are found to be platykurtic. Call money rate on the other hand is found to be leptokurtic with a value of 3.03. Thus, as per parameters of skewness, kurtosis and Jarque-Bera the data is not found to be normal.

**Unit Root Tests**—While the null hypothesis for ADF and PP tests are identical i.e. variable is non-stationary at level, the null hypothesis for KPSS test is the opposite i.e. variable is stationary at level.

**Table 1 - Unit Root Tests for Stationary**

Variables	ADF Test	PP Test	KPSS Test	Level of Stationary
	H <sub>0</sub> : Variables is non-stationary	H <sub>0</sub> : Variables is non-stationary	H <sub>0</sub> : Variables is stationary	
LnBSP	1.840	1.978	1.107*	
ΔLnBSP	-11.033*	-11.106*	0.135	1 <sup>st</sup>
LnIIP	3.866	3.161	1.280*	
ΔLnIIP	-2.157**	-27.259*	0.188	1 <sup>st</sup>
LnWPI	2.400	3.255	0.958*	
ΔLnWPI	-5.070*	-5.025*	0.804*	1 <sup>st</sup>
LnM3	10.331	10.141	1.179*	
ΔLnM3	-0.882**	-6.396*	0.336	1 <sup>st</sup>
LnER	1.165	1.157	1.059*	
ΔLnER	-7.759*	-7.620*	0.143	1 <sup>st</sup>
CMR	0.219	0.139	0.312**	
ΔCMR	-7.979*	-8.183*	0.443***	1 <sup>st</sup>

\* , \*\* and \*\*\* denotes significance at 1%, 5% and 10% level respectively  
 Δ represents first difference

Where, BSP, IIP, WPI, M3, ER and CMR refer to Banking Stock Prices, Index of Industrial Production, Wholesale Price Inflation, Broad Money Supply, Exchange Rate and Call Money Rate respectively.

On the basis of these three tests, both dependent and independent variables are not stationary at level. However when changed to first difference, all variables become stationary i.e. all variables are said to be integrated of the first order. Therefore, Granger causal analysis can be applied after converting the series into first difference.

**Lag Order Selection Criterion** – Optimal lags act an important input while running Granger causality analysis. The study applies unrestricted VAR model to identify the ideal number of lags using lag length criteria. As per the results, Schwarz information criterion indicate the number of lags as 0 while the Hannan Quinn information criterion indicate the number of lags as 1. The study rejects the results from SIC and HQIC as it is recommended to take at least 2 lags if the number of observation exceeds 100 to get reliable results. Moreover it also argued that SIC does not give reliable results in large samples and performs consistently only in case of small samples (Pesaran and Shin, 1998). Akaike information criterion on the other hand estimates the number of lags as 8. Taking very high number of lags is also not recommended as it leads to spurious

results due to the influence of such older values on the current value. The study thus considers 2 lags as per sequential modified LR statistic and final prediction error criterion as an input for applying Granger causality test.

**Granger Causality Test** – The table below highlights the results of Granger causality test conducted between banking stock prices in India and macroeconomic variables by converting the data series into first difference. The null hypothesis (first variable in the pair does not Granger cause the other) is strongly rejected for causality from BSP to ER as the F-statistic 12.753 is significant at 1% level. Instead, the alternative hypothesis is accepted i.e. banking stock prices in India Granger causes exchange rate. There are another two weak causalities from banking stock prices towards call money rate (F-statistic 2.772) and from wholesale price inflation towards banking stock prices (F-statistic 2.350) significant at 10%. As the p-value for both causalities is above 0.05 but lesser than 0.10, the relationship is considered as a weak causality. However, the possibility of bidirectional causal relationship is ruled out completely.

**Table 2 - Granger Causality Analysis**

Pairwise Granger Causality Test			
Lags 2			
Null Hypothesis	F-Statistic	Probability	
IIP does not Granger Cause BSP	0.144	0.865	
BSP does not Granger Cause IIP	1.362	0.260	
WPI does not Granger Cause BSP	2.350	0.100***	
BSP does not Granger Cause WPI	0.576	0.563	
M3 does not Granger Cause BSP	0.141	0.868	
BSP does not Granger Cause M3	0.351	0.704	
ER does not Granger Cause BSP	0.607	0.546	
BSP does not Granger Cause ER	12.753	0.001*	
CMR does not Granger Cause BSP	1.106	0.334	
BSP does not Granger Cause CMR	2.772	0.0673***	

\*, \*\* and \*\*\* denotes significance at 1%, 5% and 10% level respectively

As per the results, there exists a unidirectional causality from banking stock prices towards exchange rate at 5% significance level. This strengthens the belief that Indian equity has a significant effect on the value of exchange rate and is a leading indicator for the same. Symth & Nandha (2003), Pan et al. (2007), Asaolu & Ogunmyiwa (2010), Mahedi (2012) and Tuncer et al. (2014) also established similar causal relationship between exchange rates and stock prices. The study also established a weak causality from banking stock prices towards call money rate suggesting that changes in banking stock prices shall influence the monetary policy that includes interest rates.

Wholesale price inflation however acts as a leading indicator of banking stock prices strengthening the case that equity acts as a hedge against inflation and therefore changes in inflation impacts stock prices. These significant results confirm the argument that stock prices act as a leading economic indicator in most cases as it imbibes the expectations of the investors.

**Stability Analysis** – Testing the model for stability is critical for getting reliable results from variance decomposition and impulse response function. The results are mentioned as below.

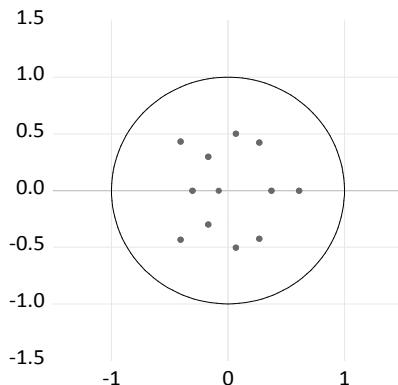
**Table 3 - Roots of Characteristic Polynomial**

Lag specification: 1 2	Root	Modulus
0.610051		0.610051
-0.407857 – 0.432408i		0.594410
-0.407857 + 0.432408i		0.594410
0.067371 – 0.502839i		0.507332
0.067371 + 0.502839i		0.507332
0.268534 – 0.424518i		0.502320
0.268534 + 0.424518i		0.502320
0.372821		0.372821

-0.169852 – 0.298613i		0.343540
-0.169852 – 0.298613i		0.343540
-0.305194		0.305194
-0.080297		0.080297
No root lies outside the unit circle		
VAR satisfies the stability condition		

Therefore, as it can be inferred from the table above, the modulus of all the roots is less than one and lying within

Figure 1: Inverse Roots of AR Characteristic Polynomial



## CONCLUSION AND IMPLICATIONS

The study aimed to investigate the causal relationship between banking stock prices in India (S&P BSE Bankex) and five macroeconomic variables (industrial production, inflation, money supply, exchange rate and interest rate) over the period April 2009 to March 2018 i.e. the period post sub-prime lending crisis. As per the results obtained from three unit root tests (ADF, PP and KPSS), the data was integrated of the first order. As per the results from Granger causality test, a strong unidirectional relationship from banking stock prices to exchange rate (at 1% significance level) and two weak unidirectional causal relationships from stock prices to interest rates and from inflation towards stock prices (at 10% significance level).

The study holds vast implications for several stakeholders including investors, policy makers and academicians. For investors, the study provides evidence to map their investment strategy with macroeconomic variables and observe their assets with leading or lagging macroeconomic variables. Policy makers can leverage the results of this study to strike a balance between macroeconomic variables and stock market returns by formulating favourable monetary and fiscal policy. Lastly for academicians, the study further extends the belief regarding the relationship between macroeconomic variables and stock prices to sector based banking stocks. Academicians and researchers can further research their relationship by taking different time frame, including more macroeconomic variables and other sector based indices.

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## ANALYSIS OF VARIOUS MACHINE LEARNING ALGORITHMS FOR HEART DISEASE PREDICTION

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### ABSTRACT

*The data mining is the approach which can process information which is present in large scale. The prediction analysis is the method of data mining to predict future possibilities based on current information. The heart disease prediction is the approach which can predict future heart disease possibilities based on the current information. The various heart disease prediction techniques are reviewed in this paper. It is analyzed that supervised machine learning algorithms are the best performing algorithm for the heart disease prediction.*

#### Keywords

*Heart Disease, Prediction, Machine learning, Supervised learning*

### 1. INTRODUCTION

The major health issue is HD and it has affected a number of people worldwide. In recent times, heart disease becomes the major reason of death among people of age groups. Therefore, the enhancement for predicting the heart attack is required in the health sector with the help of different DL methods. The commonly seen symptoms of cardiac disease are breath shortness, physical body illness and swelling in feet are swollen. Researchers make an attempt for discovering an effective method so that the heart disease can be detected because the existing diagnosis methods of heart disease are less efficient in early time identification. There are various reasons behind this including accuracy and execution time. The precise and accurate detection of cardiac illness is relied on the earlier knowledge and information regarding the pathological events [1]. Therefore, there is a necessity of monitoring certain body metrics like BP, cholesterol, diabetes etc. in all aspects of the patient who suffers from HD. These variables are independent and assist in selecting the finest AI and ML systems.

The conventional techniques face difficulty in the analysis of enormous volume of medical data which is obtained from the healthcare devices due to its large size and complexity. The DM technique is utilized to investigate the earlier unknown patterns and trends in databases and employ that information for constructing the prediction models. A set of comparatively enhanced resources is offered through the DM to improve the sensitivity and specificity while detecting and diagnosing the diseases. The concealed patterns and relationships are extracted from the huge database by integrating the ML, statistical analysis and database technology in DM approach [2]. The DM schemes assist the physicians in generating the future

predictions. These schemes and predictive frameworks are adaptable to carry out the forecasting related to the occurrence of HD in patient in near future accurately. The HD predictive model planned on the basis of DM has included a number of stages. The initial stage of selecting the data had involved the collection of data from diverse sources in order to perform predictive analysis. The gathered data have contained a number of attributes as risk factors like Diabetes, cholesterol, BP etc. Each risk factor plays a considerable role to predict the cardiac illness. Some diagnostic parameters are comprised in the data set from which the patient is classified as normal or having HD. The gathered data often have various outliers and missing values. The availability of missing values and outliers in the real dataset lays a great impact on the accuracy and efficacy of the classification algorithm at a large extent due to which unreliable and inappropriate output are maximized. Removing outlier and missing values from the gathered data is not so easy. Data pre-processing is obligatory for representing data efficiently and machine learning classifier which ought to be trained and tested in a competent way [3]. Pre-processing step is concerned with applying several pre-processing methods on the input data for making it complete. This step analyzes data meaningfully and provide optimal outcomes. Pre-processing schemes such as removing of missing values, standard scalar, and MinMax Scalar are generally implemented to the dataset for efficient application in the classifier models. The standard scalar guarantees that each feature has the mean 0 and variance 1, brings all features to the similar coefficient. MinMax Scalar approach, in the same manner, shifts the data to bring all features between 0 and 1 [4]. Feature selection step is essential for the machine learning process because occasionally redundant features influence the classification efficiency of the machine

learning classifier. This step optimizes the classification accuracy and decreases the execution time of the applied classifier model. Some commonly used feature selection algorithms are Relief Feature Selection Algorithm, Minimal-Redundancy-Maximal-Relevance Feature Selection Algorithm (mRMR), and Least Absolute Shrinkage and Selection Operator. In Relief algorithm, weights are assigned to all features in the dataset and these weights may be updated as the time passes. The priority is given to features having high weight values, while the remaining ones are less prioritized. This algorithm makes use of the same approach as in K-NN that decide the weights of features. In mRMR algorithm, features related to the target label are selected [5]. The chosen features could be irrelevant variables which must be managed. This algorithm applies Heuristic search approach and chooses best features that have greatest significance and least redundancy. It validates one feature at a cycle and measures redundancy of every pair. The mRMR does not consider the joint association of attributes. In the third stage, different classification models are applied for generating generalized predictions regarding the risk of heart diseases. Some popular classification models include ANN, random forest, SVM, Naïve Bayes, decision tree, logistic regression etc. A logistic regression is a classification algorithm. For binary classification issue, the value of predictive variable  $y$  is predicted when  $y \in [0, 1]$ . Here, 0 and 1 represent the negative class and positive class respectively. This algorithm applies multiclassification for predicting the value of  $y$  when  $y \in [0, 1, 2, 3]$  [6]. Naive Bayes is a supervised classification algorithm. This algorithm depends on conditional probability theorem for determining the class of a fresh feature vector. This classifier applies the training dataset for finding the conditional probability value of vectors for a specified class. Once the probability conditional value of all vectors has been measured, the class of new vectors is computed according to its conditionality probability. This algorithm is generally applied for text-based classification issue. The artificial neural network is a supervised machine learning algorithm. In fact, it is a mathematical model that integrates neurons that transfer messages. This classifier model has three major elements such as inputs, outputs, and transfer functions. The input units accept unusual values and weights. These values and weights are improved in the course of network training. The outcome of the ANN is measured for the given class; the weight is remeasured by the error margin amid the output of predicted and original class. This classifier model is constructed by integrating neurons. A decision tree is a supervised machine learning algorithm. The configuration of a decision tree is similar to a normal tree. In DT, every node refers to a leaf node or decision node [7]. The decision tree algorithms are quite simple and logical in decision-making. A decision tree consists of internal and external nodes connected with each other. The internal nodes efficient take part in the decision-making and the child node visits the next nodes. However, the leaf node has no child nodes and is assigned with a label. The last phase in heart disease prediction is result

validation. The validation phase is concerned with evaluating the performance of the predictive machine learning models so that their strength for generalized prediction can be validated. The validation phase contributes significantly to ensure that the prediction models do not overfit the training data. Cross validation is one of the most widely applied processes for validating the model's performance based on the original dataset.

## 2. LITERATURE REVIEW

Senthilkumar Mohan, et.al (2019) suggested a new technique named HRFLM utilized to discover a valuable attribute with the implementation of ML schemes [8]. The hybrid RF was integrated with the LM. This technique led to enhance the accuracy while predicting the heart disease. The predictive model was presented by incorporating attributes and various classification methods. An improved performance level with 88.7% accuracy was obtained from the suggested technique. Additionally, the suggested technique was shown appropriate for predicting the heart disease.

SanchayitaDhar, et.al (2018) intended a hybrid approach in order to predict the heart disease in which RF and simple K-Means classification algorithms were deployed [9]. Two different ML techniques known as J48 tree and NB classification algorithms were also utilized for computing the data set. The comparison of outcomes was also done. A number of performance parameters were applied for the quantification of this approach. The outcomes indicated that the intended hybrid approach was robust.

Abdelmegeid Amin Ali, et.al (2020) introduced a method known as CNN-GRU [10]. This method emphasized on presenting an optimal ML approach that provided greater accuracy for predicting the cardiac disease. The significant attributes were extracted from the data set using LDA and PCA. These extracted attributes were considered in order to compare the introduced method with different ML algorithms. The accuracy was improved with the execution of K-fold cross-validation. The outcomes demonstrated that the precision obtained from the introduced approach was calculated 94.5% in comparison with other methods.

Anna Karen Gárate-Escamila, et.al (2020) emphasized on deploying a CHI with PCA for the enhancement of predictive accuracy of ML algorithms [11]. The classification approach had a major purpose to predict that the patient was suffered from cardiac disease or not. The dimensionality reduction methods were applied for enhancing the outputs of raw data. The presented CHI-PCA technique with Random Forest had performed efficiently while predicting the heart disease. The predictive accuracy on Cleveland dataset was computed 98.7% and accuracy for Hungarian was 99.0%. It was analyzed that the presented approach provided the consistency and proved as preferable technique.

InduYekkala, et.al (2017) recommended different ensemble techniques along with feature selection algorithm namely PSO for forecasting the occurrence of heart diseases for a

specific patient in accurate way [12]. The least ranked attributes were mitigated using Particle Swarm Optimization (PSO). Afterward, the ensemble techniques namely Bagged Tree, RF and AdaBoost were employed as a classification so that the misclassification rate was decreased and the classification performance was enhanced. The medical practitioners obtained the assistance for predicting and earlier diagnosing of heart diseases in accurate manner with the implementation of a subset of attributes. The outcomes of experiment depicted that the greater accuracy was attained through the Bagged Tree and PSO.

MohiniChakarverti, et.al (2019) established an approach in which K-Means algorithm and SBM classifier were employed depending on the prediction analysis methods in order to predict the heart disease [13]. The BP algorithm was applied with K-Means to cluster the information.

These algorithms were useful for increasing the accuracy of prediction. The performance of the established algorithm was computed on heart disease data suite taken from the UCI repository. There were 76 attributes contained in this data set. The established approach was compared with the existing technique concerning certain metrics including accuracy, error recognition rate and execution time.

Xu Wenxin, et.al (2020) projected a novel technique of predicting heart disease on the basis of ensemble model in which SVM, DT and ANN were integrated [14]. The processing of publically available data set taken from UCI was done and it was utilized in the integrated model and 3 individual models. Different parameters were utilized to compute the forecasting impact. The outcomes exhibited that the projected model performed more efficiently in contrast to 3 independent models for predicting the heart disease.

#### **COMPARISON TABLE**

Author	Year	Description	Outcome
Senthilkumar Mohan, ChandrasegarThirumalai, Gautam Srivastava	2019	Suggested a new technique named HRFLM utilized to discover a valuable attribute with the implementation of ML schemes. The hybrid RF was integrated with the LM. This technique led to enhance the accuracy while predicting the heart disease.	An improved performance level with 88.7% accuracy was obtained from the suggested technique. Additionally, the suggested technique was shown appropriate for predicting the heart disease.
SanchayitaDhar, Krishna Roy, TanusreeDey, PrithaDatta, Ankur Biswas	2018	Intended a hybrid approach in order to predict the heart disease in which RF and simple K-Means classification algorithms were deployed. Two different ML techniques known as J48 tree and NB classification algorithms were also utilized for computing the data set.	The comparison of outcomes was also done. A number of performance parameters were applied for the quantification of this approach. The outcomes indicated that the intended hybrid approach was robust.
Abdelmegeid Amin Ali, Hassan Shaban Hassan, Eman M. Anwar	2020	Introduced a method known as CNN-GRU. This method emphasized on presenting an optimal ML approach that provided greater accuracy for predicting the cardiac disease. The significant attributes were extracted from the data set using LDA and PCA.	The accuracy was improved with the execution of K-fold cross-validation. The outcomes demonstrated that the precision obtained from the introduced approach was calculated 94.5% in comparison with other methods.
Anna Karen Gárate-Escamila, Amir Hajjam El Hassani, Emmanuel Andrès	2020	Emphasized on deploying a CHI with PCA for the enhancement of predictive accuracy of ML algorithms. The classification approach had a major purpose to predict that the patient was suffered from cardiac disease or not.	The predictive accuracy on Cleveland dataset was computed 98.7% and accuracy for Hungarian was 99.0%. It was analyzed that the presented approach provided the consistency and proved as preferable technique.
InduYekkala, Sunanda Dixit, M. A. Jabbar	2017	Recommended different ensemble techniques along with feature selection algorithm namely PSO for forecasting the occurrence of heart diseases for a specific patient in accurate way. The least ranked attributes were mitigated using Particle Swarm Optimization (PSO).	The medical practitioners obtained the assistance for predicting and earlier diagnosing of heart diseases in accurate manner with the implementation of a subset of attributes. The outcomes of experiment depicted that the greater accuracy was attained through the Bagged Tree and PSO.
MohiniChakarverti, Saumya Yadav, Rajiv Rajan	2019	Established an approach in which K-Means algorithm and SBM classifier were employed depending on the prediction analysis methods in order to predict the heart disease. The BP algorithm was applied with K-Means to cluster the information.	There were 76 attributes contained in this data set. The established approach was compared with the existing technique concerning certain metrics including accuracy, error recognition rate and execution time.
Xu Wenxin	2020	Projected a novel technique of predicting heart disease on the basis of ensemble model in which SVM, DT and ANN were integrated. The processing of publically available data set taken from UCI was done and it was utilized in the integrated model and 3 individual models.	Different parameters were utilized to compute the forecasting impact. The outcomes exhibited that the projected model performed more efficiently in contrast to 3 independent models for predicting the heart disease.

#### **CONCLUSION**

In this work, it is concluded that various techniques are proposed for the heart disease prediction. The heart disease prediction technique have various phases like

pre-processing, feature extraction and classification. The various machine learning techniques are reviewed in this paper and in future hybrid machine learning algorithm will be designed for the heart disease prediction.

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## A STUDY ON AWARENESS LEVEL OF PRADHAN MANTRI MUDRA YOJANA IN SHIVAMOGGA DIST. KARNATAKA

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### ABSTRACT

*Micro units consist of various small scale activities. These units are known as the Non-corporate small business sector. This sector facing many challenges like shortage of funds, limited access to equity capital, lack of technology and among the biggest bottleneck of this sector is the week institutional financial support. In order to eliminate the financial difficulties faced by Micro entrepreneurs, the Central Government launched the Scheme called Mudra to funding the unfunded. The present research has been taken to study the current knowledge, awareness, and source of awareness of about PMMY scheme among its beneficiaries. The primary data were collected from 50 beneficiaries of Mudra scheme through questionnaire in Shivamogga district and secondary data from Mudra Website. The data was analyzed through SPSS by using statistical tools like frequency, percentage and t-test is used to test the hypothesis. The finding of the study was low level of awareness about PMMY scheme among its beneficiaries and majority of 36% of respondent's source of awareness is from relatives & friends.*

**Keywords:** Knowledge, Awareness, Micro enterprises, PMMY.

### 1. INTRODUCTION

In any developing country having huge population like India, Micro enterprises play a vital role in contributing to National Gross domestic product but also providing employment opportunities to a huge number of people at comparatively less capital than large Industries. It also helps in industrialization of backward and rural areas and assuring more equitable distribution of national income and wealth (Anup Kumar Ray 2016). Micro units consists of various small scale activities like tailors, vegetable and fruits sellers, food-service units, welding units, weaving units, khadi and cottage industries, beauty parlors, printing units, petty traders, kirana stores, pisciculture, Bee keeping, poultry farming, etc., These units are jointly known as the Non-corporate small business sector. (Annual report Mudra 2015-16).

These bottom of the pyramid, hardworking entrepreneurs continuously facing many challenges shortage of funds, Limited access to equity capital, lack of Technology and lack of infrastructure facilities and the biggest bottleneck of this sector is the week institutional financial support. In order to eliminate the financial difficulties faced by Micro entrepreneurs, the Central Government launched the Scheme called Mudra to funding the unfunded. Access to institutional finance could potentially turn these micro entrepreneurs' into strong instruments of Gross domestic product growth and creation of employment opportunities in the country.

### MUDRA OFFERINGS

#### 1. Refinance support through Banks/ MFIs/NBFCs

Shishu Up to 50,000

Kishore 50,001 to 5, 00,000

Tarun 5, 00,001 to 10, 00,000

#### 2. Overdraft facility

In addition, the overdraft amount of rupees 5000 sanctioned under PMJDY has been also classified as a Mudra loan.

**3. Micro Credit Scheme:** In this scheme loan has provided up to one lakh rupees is through Micro Finance Institutions for various micro enterprises. Model of providing loans may be through Self-help groups/ Joint Liability groups/ Individuals.

**4. Mudra Card:** A debit card provided to Mudra loan account, for availing working capital loans. Therefore loanee has to manage the working capital limit in cost-efficient manner and keep the interest burden minimum.

### 2. REVIEW OF LITERATURE

**Ravi R (2014)** in this article researcher focuses on realizing the importance of small business. The objectives of the study were to analyze the effects of micro-financing on MSEs Growth and expansion capacity in India. The author concludes that the survival of MSEs depends on largely on whether the enterprises are able to generate profit from the use of micro funds and easy access to micro credit. It also depends on regular participation of entrepreneurs in

microfinance programmes; and whether entrepreneurs are able to convert the profits made in a particular year to further investments.

**Venkatesh J (2015)** in this article author describes that the MSMEs plays a Vital role in the emergence of Indian economy. The development of these units is extremely critical to meet the national imperatives of financial inclusion and generation of significant levels of employment opportunities across rural and urban areas across the country. Indian MSMEs sectors a reality by launching a dedicated bank for MSMEs sector is known as Mudra Bank. Will spur the growth of Indian MSMEs sector and help them increase their contribution to Indian GDP from its current level of 38%. The paper highlights the significance and the importance of Mudra bank towards MSME sector.

**Ashish (2016)** in this article author has made an attempt to learn about the Mudra Yojana key objectives. The main objective of this paper is to find out the Mudra scheme products and its impact on Indian small business owners and Self Employment and analysis of performance of Pradhan mantri Mudra Yojana. the main findings and conclusion is the Mudra scheme is trying to its best to improve the status of women and other backward sections of the country especially those who are not well educated and Semiskilled. Its impact in developing strong economy will be seen in the coming years.

**Shenti (2017)** in this article the author concluded that mudra as a financial tool is found very potential in its initial stages across the country. The Mudra Yojana will definitely make a dramatic change and will help in making a developed India.

**Ali. M.S (2019)** author discuss about salient features of MUDRA loan scheme, procedure for loan sanction by bank under MUDRA scheme, achievements or milestones under MUDRA loan scheme, NPAs in MUDRA scheme, etc., is explained. The important aspect of the study is to examine the banker's perspective with special reference to problem faced by them in managing MUDRA lending. The suggestion given by author is for assessment of credit needs it should be mandatory for them submit the audited financial statements and to calculate financial ratio while providing working capital and term loans under MUDRA scheme.

**Sonu (2018)** overviewed how MUDRA scheme helps for new entrepreneurs. The important suggestions is besides the credit constraints, new entrepreneurs face many non-credit challenges MUDRA will have to facilitate other developmental and support services to the target audience, in addition to meeting their credit needs

### 3. OBJECTIVES

1. To analyze the awareness level about PMMY scheme.
2. To know the source of awareness about PMMY scheme.

### 4. HYPOTHESIS

**H<sub>0</sub>:** "There exists a low level of awareness about PMMY scheme among its beneficiaries"

**H<sub>1</sub>:** "There exists a high level of awareness about PMMY scheme among its beneficiaries"

### 5. RESEARCH METHODOLOGY

#### Source of data

The primary data is collected through questionnaire/ Interviews with beneficiaries of Mudra Scheme .The questionnaire will consist of a five point scale (Likert's scale)and secondary data are collected from journals, newspapers, magazines, Mudrawebsites, Mudrareports andbulletins, etc.

#### Sampling

A simple random sampling method was employed for selecting a representative sample from beneficiaries of Mudra Scheme in Shivamogga District. A total of 50 respondents were taken for the study.

#### Statistical tools and techniques:

The analyses of Survey data is with the help of Microsoft Excel and SPSS. The statistical analysis used includes frequencies, percentages, and t-test is used to test the hypothesis.

#### Reliability Analysis

The Reliability test was conducted to ensure the validity of the instrument. The reliability analysis shows Cronbach's Alpha is 0.823 and Number of items 10 which was considered as good enough. The 'a' score indicates that the tool is reliable.

### 6. RESULTS AND DATA ANALYSIS

**Table -1 Demographic details of Respondents**

Variable		Frequencies	Percentages
Gender	Male	41	82
	Female	9	18
	Total	50	100
Age	18-30 years	27	54
	31-40 years	14	28
	41-50 years	6	12
	51-60 years	1	2
	60& above	2	4
	Total	50	100

Education	Illiterate	6	12
	Primary	11	22
	High School	8	16
	PUC/ ITI	6	12
	Graduate	9	18
	Post-Graduate	10	20
	Total	50	100
Social Group	SC	6	12
	ST	7	14
	OBC	28	56
	Minorities	4	8
	Others	5	10
	Total	50	100
Nature of Establishment	Proprietorship	34	68
	Partnership	3	6
	Private limited company	6	12
	Self-help groups	3	6
	Others	4	8
	Total	50	100
Broad Economic Activity	Manufacturing	6	12
	Services	17	34
	Allied agriculture	9	18
	Trading	18	36
	Total	50	100

Source: Survey data.

From the table one shows the Demographic details of beneficiaries 82% of respondents were Male and 18% of respondents are female were aware of Mudra Scheme. Majority 54% of the respondents were 18 to 30 years age group and 28% of the beneficiaries were 31 to 40 years age group are aware about Mudra Scheme. 22% of respondents were primary education and 20 % of respondents were post

graduate holders it indicates that young entrepreneurs are aware about Mudra scheme. 56% were OBC beneficiaries and remaining 26% were SC/STs. Majority 68% were Proprietorship these indicates that Own account Enterprises are more in the study. 36% of respondents were trading background and 34% of respondents were services activity.

**Table-2: Knowledge and Awareness level of PMMY scheme**

Sl	Factors		Not at all aware	Slightly aware	Somewhat aware	Moderately aware,	Extremely aware	Total
1	Do you know the concept of Mudra Scheme	N	7	19	15	7	2	50
		%	14	38	30	14	4	100
2	Are you aware about objectives of Mudra scheme	N	4	13	17	10	6	50
		%	8	26	34	20	12	100
3	Do you know the products available in Mudra Scheme	N	8	11	12	12	7	50
		%	16	22	24	24	14	100
4	Are you aware about interest rates	N	3	12	9	19	7	50
		%	6	24	18	38	14	100
5	Are you aware about website of Mudra scheme	N	4	16	9	13	8	50
		%	8	32	18	26	16	100
6	Are you aware about Mudra Over draft Facility	N	11	19	8	13	9	50
		%	22	18	16	26	18	100
7	Are you aware about Mudra Debit cum – ATM card	N	7	17	6	10	10	50
		%	14	34	12	20	20	100
8	Are you aware about Documents required for availing loans under Mudra scheme	N	10	9	11	14	6	50
		%	20	18	22	28	12	100
9	Are you aware about udyamimitra.org.in to avail loans from the online website	N	5	14	10	12	9	50
		%	10	28	20	24	18	100
1	Do you know the repayment procedure of Mudra Scheme	N	3	9	15	12	11	50
0		%	6	18	30	24	22	100

Source: Survey data

From the above table two analyzes the Knowledge and Awareness level of PMMY scheme about various factors among its beneficiaries, 38% of respondents Slightly aware ,30% respondents Somewhat aware and

14% of respondents Not at all aware the concept of Mudra Scheme. 34% of respondents Somewhat aware, 26% respondentsof Slightly awareand 8% of respondents Not at all aware about objectives of Mudra Scheme. 24% of

respondents Somewhat aware, 24% respondents of Moderately aware and 16% of respondents Not at all aware about Product available in Mudra Scheme. Almost 38% of respondents were moderately aware and only 6% of respondents are not at all aware about the interest rates. Only 16% of respondents were aware about website of Mudra scheme and 40% of respondents are not aware website of Mudra scheme. 42% of respondents are aware of

overdraft facility of Mudra scheme and 22% of respondents are not at all aware about overdraft facility. 34% of respondents were slightly aware, 40 of respondents were aware and 14 % of respondents were not at all aware about Mudra Debit cum – ATM card. . 40% of respondents are aware, 22% of respondents somewhat aware and 20% of respondents are not at all aware about Documents requisition.

**Table-3: Source of awareness about Mudra Scheme**

Source	Frequency	Percentage
Newspaper	9	18
Banks correspondents/ Banks	13	26
Relatives & Friends	18	36
Television/ Media	2	4
Self-help groups	1	2
Grampanchayats	1	2
NGOs	1	2
Municipality	5	10
Total	50	100

Source: Survey data

From the above table three depicts source of awareness about Mudra scheme, Majority of 36% of respondent's source of awareness is from relatives & friends, 26% of respondents source of awareness is from Banks correspondents/ Banks, 18 % of respondents source

of awareness is from newspaper, 10 % of respondents source of awareness is from municipality office, 4% of respondents source of awareness is from Television/ Media, 2% of respondents source of awareness is from Self-help groups and Grampanchayats Respectively.

**Table-4: Type of loan taken**

Type of loan	Frequency	Percentage
Shishu - Less than 50,000	16	32
Kishore- 50,000 to 5, 00,000	24	48
Tarun - 5, 00,000 to 10, 00,000	8	16
Micro credit for Self-help groups - Rs up to 1, 00,000	2	4
Total	50	100

Source: Survey data

From the table four shows types of Mudra loan taken by respondents, 48 % of respondents were took Kishore loan, 32% of respondents were took Shishu loan, 16% of

respondents were took Tarun loan and remaining only 4% of respondents were took Micro credit through Self-help groups.

**Table-5: In which Bank / Micro finance institutions/ NBFCs you taken loan**

Source	Frequency	Percentage
Public sector banks (Excluding RRBs & SBI)	27	54
Private sector banks	3	6
Micro finance institutions	1	2
Regional Rural Banks	12	24
S B I & Associates	4	8
Co-operative Banks	3	6
Total	50	100

Source: Survey data

The above table five shows the loan disbursement performance by different financial institutions, Public sector banks including Regional Rural Banks and S B I & Associates performed well they are collectively disbursed

86% of loans and Private sector banks performed very less compared to public sector banks i.e. only 6% of loans, and Co-operative Banks also perform less.

### HYPOTHESIS TESTING

**Table-6: One sample t –test results**

Overall Knowledge and awareness level about Mudra Scheme							
Variable	Mean	Mean Difference	Std. Deviation	Std. Error Mean	t	Sig.(2-tailed)	Decision Made (Null)
Overall awareness level	3.038	0.03800	0.78113	0.11047	0.344	0.732	Accepted

Test value 3, at 95% confidence Interval , n=50 and df= 49

Source: Survey data

The table six presents one sample t-test results of Overall Knowledge and awareness level about Mudra Scheme mean=3.038, Standard deviation =0.78113, t=0.344, with 50(n-1) degrees of freedom 49 and p value is 0.732. As a result p value is more than 0.05, so it is consider statistically insignificant. Hence null hypothesis is accepted. Thus the overall result highlights that knowledge and awareness level among beneficiaries of Mudra Scheme is very low.

### 7. FINDINGS

From the analysis it is evident that Male respondents with age group of 18 to 30 years were aware of Mudra Scheme. 22% of respondents were primary education and 20 % of respondents were post graduate holders it indicates that young entrepreneurs are aware about Mudra scheme. 56% were OBC beneficiaries and remaining 26% were SC/STs. Majority 68% were Proprietorship these indicates that Own account Enterprises are more in the study. 36% of respondents were trading background and 34% of respondents were services activity. 30% of respondent's gross annual incomewas 50,000 to 1, 00,000 rupees.From the t-test it shows low level of awareness about PMMY scheme among its beneficiaries. Majority of 36% of respondent's source of awareness is from relatives & friends,48 % of respondents were took Kishore loan, 32% of respondentswere took Shishu, Public sector banks including Regional Rural Banks and S B I & Associates performed well they are collectively disbursed 86% of loans.

### 8. SUGGESTIONS

Based on the above findings the following suggestions should be given the government should took decision to create awareness programmes of Mudra Scheme in rural and semi urban areas through banks/ financial institutions and also through Grampanchayats/ Municipality offices. Tarun category performs very low and need to improve by providing more and more loans. It is suggested to private sector banks lend more and more loans under Mudra Scheme and also create awareness campaigns at branch, regional and head offices about Mudra scheme.

### 9. CONCLUSION

The study concluded that if Mudra scheme is implementing in the right way the by providing loans to right person the scheme. Mudra scheme will add to the well-being of the entrepreneurs engaged in Micro and small scale industries

which will positively shape the progress of the economy as a whole if implemented as per the priority sector lending schemes to the needy and poor people, it may work as important tool for government for developing nation through financial inclusion and may boost the Indian growth rate of economy.

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## ANALYSIS OF IMPACT OF DEMONETIZATION ON THE AUTOMOBILE INDUSTRY IN INDIA

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### ABSTRACT

*On November 8<sup>th</sup>, 2016 Prime Minister Sh. Narendra Modi took the whole country on surprise with the announcement of Demonetization of Rs. 500 and Rs. 1000 currency notes. The sudden announcement of stripping the currency unit of Rs.500 and Rs.1000 of its status as legal tender created a cash crunch in the economy where in every sector was effected. The present paper aims to analyze the impact of demonetization on production, domestic sales and export of vehicles in automobile industry in India. Analysis revealed that although demonetization had affected the automobile sector for short period, yet, at present, the growth rate of production, domestic sales and exports is either declining or negative as a result of combined effect of major structural reforms like demonetization, changes in BS emission standard norms, rise in unemployment in the country, economic and industrial activity slowdown etc. that had taken place in the last few years. Therefore, the sector has to show great advances in terms of technology and innovation catering to the needs of customers in the wake of global scenario.*

**Key words:** Demonetization, Automobile industry, Compounded Annual Growth Rate (CAGR)

### INTRODUCTION

Indian automobile industry is one of the fastest growing industries in the world and emerging as a global sourcing hub for automotive industry. It has deep forward and backward linkages with various other segments of the economy resulting in strong multiplier effect of industrial growth and has emerged as a major contributor to India's Gross Domestic Product (GDP). This dynamic industry currently accounts for almost 7 per cent of country's GDP and employing about 37 million people both directly and indirectly. India is emerging as one of the world's fastest growing and largest two wheeler market, 2<sup>nd</sup> largest heavy bus maker, 3<sup>rd</sup> largest heavy truck maker, 4<sup>th</sup> largest car maker and 7<sup>th</sup> largest commercial vehicle maker in the world (SIAM Annual Report 2018-19). As per data released by the Society of Indian Automobile Manufacturers (SIAM), the gross turnover of the automobile manufacturers in India has increased to 67,724 USD Million in 2016-2017 from 63,866 USD Million in 2015-2016 showing the growth of 6.04 per cent. The Vision of Automotive Mission Plan 2016-26 states that "By 2026, the Indian automotive industry will be among top three of the world in engineering, manufacture and export of vehicles and auto components, and will encompass safe, efficient and environment friendly conditions for affordable mobility of people and transportation of goods in India comparable with global standards, growing in value to over 12% of India's GDP, and generating an additional 65 million jobs." The mission further aimed at to become the growth engine of 'Make in India' programme, contribute significantly to 'Skill India' programme, enhance universal mobility, witness the several fold increase in net export of the Indian Automotive Industry and to ensure a comprehensive and

predictable policy regime that enables the industry to govern in a stable and sustainable manner.

### CONCEPT AND HISTORY OF DEMONETIZATION IN INDIA

Demonetization is the act of stripping a currency unit of its status as legal tender. It occurs whenever the government feels that there is need to ban or change the existing national currency with new notes or coins (Preetha, 2019). On November 8<sup>th</sup>, 2016 Prime Minister Sh. Narendra Modi astonished the whole country with the announcement of Demonetization of Rs. 500 and Rs. 1000 currency notes. The sudden announcement of stripping the currency unit of Rs.500 and Rs.1000 of its status as legal tender created panic among the public which further led to liquidity crunch in the economy and badly affected those sectors where mostly cash transaction take place. This is not the first time in Indian history that demonetization has taken place. Infact demonetization happened in India even before 2016. First currency ban had taken place in 1946, when the currency notes of Rs. 1,000 and Rs. 10,000 were removed from circulation. However, both the notes were reintroduced in 1954 with an additional introduction of Rs. 5,000 currency. In 1978, the Moraji Desai Government demonetized Rs. 1,000, Rs. 5,000, and Rs. 10,000 to curb illegal transactions and anti-social activities. While this is the third time in the Indian history that the Prime Minister of India, Mr Narendra Modi, declared demonetization of INR 500/- and INR 1,000/- currency on 8th November, 2016. The first two instances of demonetization did not have an impact like the recent one as the currency of such higher denomination was not accessible to the common people. But this time, the demonetized currency represents 86% of the total currency in circulationRawal (2019).

Therefore, the impact of demonetization can be seen on various sectors. Since Automobile industry is the key driver of the economy and plays a significant role in country's sustainable economic and industrial development. Therefore, present study aims to analyze the impact of demonetization on Indian Automobile Industry.

## LITERATURE REVIEW

**Narayanan (2004)**, analyzed that growth rate of the firms are largely determined by non price factors like technology, size of the firm, vertical integration, capital intensity and the age of the firm. The study also found that the behaviour of firms is largely governed by policy regime in which it operates and this in turns had varied effect on its growth.

**Katke et al (2017)**, analyzed the impact of demonetization on Indian car industry and customer buying behavior after demonetization. The study focused on short term results only. The study found that demonetization has registered negative impact on sales in November, 2016 as the overall auto sales dropped by 5.48 per cent as compared to previous year. **Veerakumar (2017)**, found that four variables namely gender, age, annual income and occupation are significantly associated with the impact of demonetization. Findings also revealed that respondents believed that demonetization helps to destroy black money, corruption, terrorism etc. **Preetha (2019)**, concluded that demonetization has greatly impacted Indian Society and Economy and people have suffered a lot due to poorly executed plan by government. **Rawal (2019)**, revealed that automobile sector faced a short term impact where the purchases were delayed due to scarcity of liquid funds, but was neutral for purchases through financing or banked cash. Demonetization affected the market for short period which led to increase inventory, production cuts & plants shutdown.

The review of existing literature revealed that various studies have been carried out on measuring impact of demonetization on economy as a whole and on various sectors but so far no worthwhile attempt has been made to study the long run and more specific impact of demonetization on automobile sector in terms of growth of production, domestic sales and exports of vehicles.

## OBJECTIVES OF THE STUDY

1. To study the concept and history of demonetization.
2. To analyze the impact of demonetization on automobile industry.

## RESEARCH METHODOLOGY

The Present study is descriptive in nature. The data was collected from secondary sources such as journals, magazines, published reports, various websites related to automobile industry and by reviewing existing literature. Impact of demonetization on automobile industry is analyzed on the parameter of growth of production, domestic sales and exports of vehicles. To analyze the pre demonetization CAGR the period of study includes from 2000-01 to 2016-17 and period of 2017-18 to 2019-20 is incorporated to study the post demonetization impact on the industry.

## TREND OF AUTOMOBILE INDUSTRY IN INDIA

Demand for automobile has risen at significant rates across segments during last decade. But currently the automobile industry is facing declining or negative growth rates. The reasons may be slow economic growth rate, low purchasing power of people, less product and process innovation, less customer oriented products, government policies, poor cost management etc. Following are the trend of automobile industry analyzed on the basis of production, sales and exports.

**Trend of Production in Indian Automobile Industry**  
**Table 1**

Category	Automobile Production Trend					No. of Vehicles		
	Period	Commercial Vehicles (C.Vs)	Growth %	Passenger Vehicles (P.Vs)	Growth %	Three wheelers	Growth %	Two wheelers
<b>Pre Demonetization Period</b>								
2000-01	156706	-	640934	-	203234	-	3758518	-
2001-02	162508	3.7	669719	4.5	212748	4.7	4271327	13.6
2002-03	203697	25.35	723629	8.1	276719	30.1	5076221	18.84
2003-04	275040	35	984560	36.1	366223	32.34	5622741	10.77
2004-05	353703	28.6	1209876	22.88	374445	2.2	6529829	16.13
2005-06	391083	10.57	1309300	8.22	434423	16	7608629	16.52
2006-07	519982	32.96	1545223	18	556126	28	8466666	11.28
2007-08	549006	5.58	1777583	15	500660	(9.97)	8026681	(5.20)
2008-09	416870	(24.07)	1838593	3.43	497020	(0.72)	8419792	4.89
2009-10	566608	35.92	2351240	27.88	619093	24.56	10512889	24.68
2010-11	760735	34.3	2982772	26.86	799553	29.15	13349349	26.98
2011-12	911574	19.83	3123528	4.72	877711	9.78	15453619	15.76
2012-13	831744	(8.76)	3233561	3.5	839742	(4.33)	15721180	1.73
2013-14	699,035	(15.95)	3,087,973	(4.50)	830,108	(1.15)	16,883,049	7.39
2014-15	698,298	(0.11)	3,221,419	4.32	949,019	14.32	18,489,311	9.51
2015-16	786,692	12.66	3,465,045	7.56	934,104	(1.57)	18,830,227	1.84
2016-17	810,253	2.99	3,801,670	9.71	783,721	(16.10)	19,933,739	5.86

CAGR		10.81		11.76		8.80		10.99
<b>Post Demonetization period</b>								
2017-18	895,448	10.51	4,020,267	5.75	1,022,181	30.43	23,154,838	15.81
2018-19	1,112,405	24.23	4,028,471	0.20	1,268,833	24.13	24,499,777	5.81
2019-20	752,022	(32.40)	3,434,013	(14.76)	1,133,858	(10.64)	21,036,294	(14.14)
<b>CAGR</b>		(8.35)		(7.57)		(5.32)		(4.68)

**Source:** SIAM Annual Report; Growth (in percentage) computed from available production statistics

CAGR (in percentage) computed from computed growth (in percentage)

In the Pre Demonetization phase production of all the segments showed a tremendous growth and even in 2007-08 and 2008-09 when the whole country was facing financial crisis the overall performance of the industry was not so poor. With the combined effect of high interest rates, high fuel prices, depressed market conditions and low sentiments in consumer confidence the FY 2013-14 faced the negative growth for C.Vs, P.Vs and three wheeler segments. After the demonetization in 2017-18 and 2018-19 marginal growth can be seen in P.Vs whereas other segments registered the significant positive growth in

production of vehicles showing the negligible impact of demonetization on overall automobile sector. A major significant decline can be seen in all the segments in 2019-20. Therefore, after demonetization in 2019-20, at present, CAGR registered the highly negative growth rate of 8.35 per cent for C.Vs, 7.57 per cent for passenger cars, 5.32 per cent for three wheelers and 4.68 per cent for two wheelers as a result of the combined effect of occurrence of reformative events like Demonetization, Changeover to BS IV and introduction to GST etc. Further, the transition to BS- VI also led to a production cut of upto 20% in December, January, February 2020 to manage inventory (Excerpt from Indian Auto Industry status Report 2020).

**Trend of Domestic Sales in Indian Automobile Industry**  
**Table 2**

Category	Automobile Domestic Sales Trend				No. of Vehicles			
	Period	Commercial Vehicles (C.Vs)	Growth %	Passenger Vehicles (P.Vs)	Growth %	Three wheelers	Growth %	Two wheelers
<b>Pre Demonetization Period</b>								
2000-01	136585	-	690562	-	181899	-	3634378	-
2001-02	146671	7.38	675116	(2.24)	200276	10.1	4203725	15.67
2002-03	190682	30	707198	4.75	231529	15.6	4812126	14.47
2003-04	260114	36.41	902096	27.56	284078	22.7	5364249	11.47
2004-05	318430	22.42	1061572	17.68	307862	8.4	6209765	15.76
2005-06	351041	10.24	1143076	7.68	359920	16.91	7052391	3.57
2006-07	467765	33.25	1379979	20.73	403910	12.22	7872334	11.63
2007-08	490494	4.86	1549882	12.3	364781	(9.69)	7249278	(7.91)
2008-09	384194	(21.67)	1552703	0.18	349727	(4.13)	7437619	2.59
2009-10	531395	38.31	1949776	25.57	440368	25.92	9371231	25.99
2010-11	684905	28.89	2501542	28.3	526024	19.45	11768910	25.59
2011-12	809532	18.2	2618072	4.66	513251	(2.43)	13435769	14.16
2012-13	793150	(2.02)	2686429	2.6	538291	4.88	13797748	2.69
2013-14	632,851	(20.21)	2,503,509	(6.81)	480,085	(10.81)	14,806,778	7.31
2014-15	614,948	(2.83)	2,601,236	3.90	532,626	10.94	15,975,561	7.89
2015-16	685,704	11.51	2,789,208	7.23	538,208	1.05	16,455,851	3.01
2016-17	714,082	4.14	3,047,582	9.26	511,879	(4.89)	17,589,738	6.89
<b>CAGR</b>		10.89		9.72		6.68		10.35
<b>Post Demonetization Period</b>								
2017-18	856,916	20.00	3,288,581	7.91	635,698	24.19	20,200,117	14.84
2018-19	10,07,311	17.55	3,377,389	2.70	7,01,005	10.27	21,179,847	4.85
2019-20	717,688	(28.75)	2,773,575	(17.88)	636,569	(9.19)	17,417,616	(17.76)
<b>CAGR</b>		(8.48)		(8.16)		.06		(7.14)

**Source:** SIAM Annual Report; Growth (in percentage) computed from available domestic sales statistics

CAGR (in percentage) computed from computed growth (in percentage)

From the above table it can be clearly seen that in 2003-04 several macroeconomic factors such as GDP growth rate of over 8 per cent, public investment in infrastructure, excise duty reduction, reduced interest rates, and growing penetration of finances in rural and semi-urban areas triggered the growth of Automobile industry (SIAM Annual Report 2003-04). In spite of a major decline in

financial year 2013-14, automobile industry registered the significant positive CAGR of 10.89 per cent for C.Vs, 9.72 per cent for passenger cars, 6.68 per cent for three wheelers and 10.35 per cent for two wheelers before demonetization. In 2016, the declining growth rate can be seen in passenger vehicle segment due to fear of increased government scrutiny on high-value transactions and uncertainty in the government policy. As result of which People postponed the purchase and delayed taking the delivery of their vehicles that temporarily dented the demand for premium

P.Vs. Further, in case of domestic sales the CAGR of last three years is highly negative. C.Vs has shown the negative CAGR of 8.48 per cent as compared to 8.16 per cent for P.Vs, .06 per cent positive CAGR for three wheelers and 7.14 per cent negative CAGR for two wheelers. In 2017-18 and 2018-19, the industry registered a robust growth of 20 per cent and 17.55 per cent in C.Vs respectively. Various factors such as floods in Kerala, weak festival period, increase in the cost of vehicle acquisition, low demand in

rural markets, the liquidity crisis, economic slowdown and reduced industrial activity affected consumer emotions and hence dented the demand for vehicles (SIAM Annual Report, 2018-19). Moreover, the unemployment rate in India averaged 9.21 per cent from 2018 until 2020 (Trading economies). Therefore, the financial year 2019-20 registered the significant negative growth in all the segments and led to overall negative CAGR in the post demonetization period.

**Trend of Exports in Indian Automobile Industry**  
**Table 3**

Category	Automobile Export Trend			No. of Vehicles				
	Period	Commercial Vehicles (C.Vs)	Growth %	Passenger Vehicles (P.Vs)	Growth %	Three wheelers	Growth %	Two wheelers
<b>Pre Demonetization Period</b>								
2000-01	13772	-	27112	-	16263	-	111138	-
2001-02	11870	13.81	53165	96.1	15462	(4.93)	104183	(6.26)
2002-03	12255	3.24	72005	35.44	43366	180.47	179682	72.47
2003-04	17432	42.24	129291	79.56	68144	57.14	265052	47.5
2004-05	29940	71.75	166402	28.7	66795	(1.98)	366407	38.24
2005-06	40600	35.60	175572	5.5	76881	15.1	513169	40.05
2006-07	49537	22	198452	13	143896	87.17	619644	20.75
2007-08	58994	19.1	218401	10.1	141225	(1.86)	819713	32.29
2008-09	42625	(27.75)	335729	53.72	148066	4.84	1004174	22.5
2009-10	45007	5.59	446146	32.89	173282	17	1140184	13.54
2010-11	74043	64.51	444326	(0.41)	269968	55.79	1531619	34.33
2011-12	92663	25.15	507318	14.18	362876	34.41	1947198	27.13
2012-13	79944	(13.73)	554686	9.34	303088	(16.48)	1960941	0.71
2013-14	77,050	(3.62)	596,142	7.47	353,392	16.60	2,084,000	6.28
2014-15	86,939	12.83	6,21,341	4.23	4,07,600	15.34	24,57,466	17.92
2015-16	1,03,124	18.62	6,53,053	5.10	4,04,441	(0.77)	24,82,876	1.03
2016-17	1,08,271	4.99	7,58,727	16.18	2,71,894	(32.77)	23,40,277	(5.74)
CAGR		13.75		23.14		19.24		20.97
<b>Post Demonetization Period</b>								
2017-18	96,865	(10.53)	7,48,366	(1.37)	3,81,002	40.13	28,15,003	20.29
2018-19	99,933	3.17	6,76,192	(9.64)	5,67,683	49.00	32,80,841	16.55
2019-20	60,713	(39.25)	6,77,311	0.17	5,02,169	(11.54)	35,20,376	7.30
CAGR		(20.83)		(4.86)		14.80		11.82

**Source:** SIAM Annual Report; Growth (in percentage) computed from available exports statistics

CAGR (in percentage) computed from computed growth (in percentage)

Alignment with the European regulations has acted as the boon for Indian Automobile Industry (SIAM Annual Report 2002-03) as the three wheeler segment showed the remarkable growth of 180.47 per cent followed by two wheeler segment that witnessed the robust growth of 72.47 per cent in FY 2002-03. Pre Demonetization period has registered the double digit significant positive CAGR of 13.15 per cent for C.Vs, 23.14 per cent for P.Vs , 19.24 per cent for three wheelers and 20.97 per cent for two wheelers.

After demonetization, in 2016-17 the off shore demand for three wheelers and two wheelers declined by 32.77 per cent and 5.74 per cent respectively where as robust growth can be seen in three wheeler and two wheeler segment in 2017-18 and 2018-19 respectively signifying the short term impact of demonetization on this sector. The export of commercial vehicle segment declined by 10.53 per cent in 2017-18 and revived with the marginal growth of 3.17 per cent in 2018-19 and again declined by 39.25 per cent in 2019-20 which is a major cause of worry. In 2019-20 a

slight growth of 0.17 per cent can be seen in the passenger cars segment after the decline by 9.64 per cent in 2018-19. The post demonetization automobile export CAGR of C.Vs and P.Vs registered the negative CAGR of 20.83 per cent and 4.86 per cent respectively where as three wheelers and two wheelers registered the significant positive CAGR of 14.80 per cent and 11.82 per cent respectively which clearly indicates the impact of demonetization on C.Vs and P.Vs. Currently, the overall negative growth rate of export of vehicle is of major concern and it directly impacts the FDI inflow in the country.

## CONCLUSION

The move of demonetization taken by central government was initiated to curb or eliminate the black money which impacted various sectors of the economy. The impact of the measures bought a disruption and ambiguity in short term and will show positive implication in longrun. Automobile sector was also not untouched by the effects of demonetization in India. Findings revealed that demonetization has temporarily negatively impacted the

automobile industry, mainly the passenger vehicle segment. Society of Indian automobile manufacturers (**SIAM**) has called it a temporary disruption. Currently, the automobile industry is facing the overall negative growth rate due to combined effect of various reforms such as demonetization, changes in BS emission standard norms, low GDP, introduction to GST, depressed economy and fast policy changing attitude of the government. There is the need that government should bring policies and impactful reforms favourable for the revival and significant growth of the automobile industry. The automobile companies should really need to think strategically to transform the prospects in to the customers and boost domestic sales. Policies and strategies along with the inclusion of latest and improved technology and increased investment in R&D should be made in order to increase the demand for vehicles.

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## GENETIC CLUSTERING TECHNIQUE

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### ABSTRACT

The privacy of network data and computer resources are limited. Any intruder misuses the information or resources over the network. IDS help to detect, identify and classify attacks in online or offline mode. This proposed techniques use anomaly based detection using clustering to find out network attacks. It uses genetic process. Each of chromosomes mentions the centroid of the k clusters. Proposed system use two stage fitness function i) Define confidence interval ii) Computer and increase inter-cluster variance. Accuracy of this method will high to detect and prevent attacks.

**Keywords:** Clustering, Anomaly based IDS, IDS.

### I. INTRODUCTION

To significantly increased network, need to security system. Intrusion detection system is most important issues to solve this problem. An intrusion is a group of actions that protect network system and give confidentiality, integrity of computer resources.

IDS aids to monitor the network resources to find out and prevent the system from any intrusion. Based on the detection technique, IDS classified into two techniques.

- i) Misuse detection
- ii) Anomaly based detection

Misuse detection or signature based IDS compares the observed activity with predefined rules that defined known attacks. If any match is found, it states the attack. Otherwise no attacks persist in the network.

Anomaly detection defines the estimated normal behavior and it monitors the network, if anything deviates from normal behavior, it states it as attacks. Normalbehavior defined by some threshold value. Main advantage of signature based IDS gives best detection result of known attacks. It should not find out unknown attacks. But anomaly based IDS find out unknown attacks effectively. It increase false positive rate effectively. It increase false positive rate.

Anomaly based IDS follows two level of abstraction.

- i) Define normal behavior
- ii) Deviation degree measure from normality

Anomaly detection technique uses some techniques to establish the normal behavior, and also mention anything deviates from normal behavior.

This paper used clustering based detection techniques combined with genetic algorithm. This is made up of chromosomes, which real numbers indicating k cluster centers is set at randomly. This paper proposes two level of function to get optimal solution.

- i) Cluster filtered based on the confidence value.

ii) Matrix is maximized through their genetic generations.

### II) Cluster Analysis:

Cluster Analysis means finding groups in data. Partition set of samples into group based on similarity measures.

Dataset D contains P attributes:

$$D_n = [A_1, A_2, A_3 \dots A_p]$$

D is partitioned into  $\{C_i, i=1-k\}$  clusters

$$SM_{DJ/Ci}(A_1, A_2 \dots A_p) = \text{Max}(SMDJ/Ci(A_1, A_2 \dots A_p) / i ! = L)$$

Where SM is a similarity measures between  $D_i$  and  $C_k$ .

These are three partitioning approaches can be used in anomaly based IDS.

1. Hierarchical approach
2. Bio-mimetic approach
3. non Hierarchical approach

Hierarchical approaches uses two method to group the data.

1. Bottom up strategy starts from its own clusters and pairs are merged moved up the hierarchy.
2. Top down approach starts in one cluster, and splits performed recursively moves down the hierarchy .

Non-hierarchical approach needs random initialization and termination. Bio-mimetic approach, work based on human biology such as neural network, genetics and immunology. Those models can easily adapt in both supervised and unsupervised processes.

Anomaly detection process uses two stage fitness function.

1. Calculate confidence interval to refine clusters.
2. Maximize the covariance matrix.
3. Confidenceinterval assesses quality of cluster and reduces the partitioning confusion.

If similarity condition is not satisfied within the confidence interval, a rejection class is created. This cluster contains normal and abnormal instances. The main steps of a clustering algorithm are:

- Initialization: Total number of clusters, cluster centroids
- Similarity measure: Distance, Density.
- Termination criterion: Stable configuration, iteration number.

Each steps of this algorithm depend on the partitioning approach. This paper achieved normal and abnormal clustering process in two levels:

Level 0: Initiate several partitioning solutions of data space into cluster 1 and cluster 2.

Level 1: Genetic reassignment. Instances are reassigned to clusters to maximize the fitness function.

### III. PROPOSED SOLUTION:

This proposed technique centered genetic algorithm and clustering process.

#### A. Genetic algorithm:

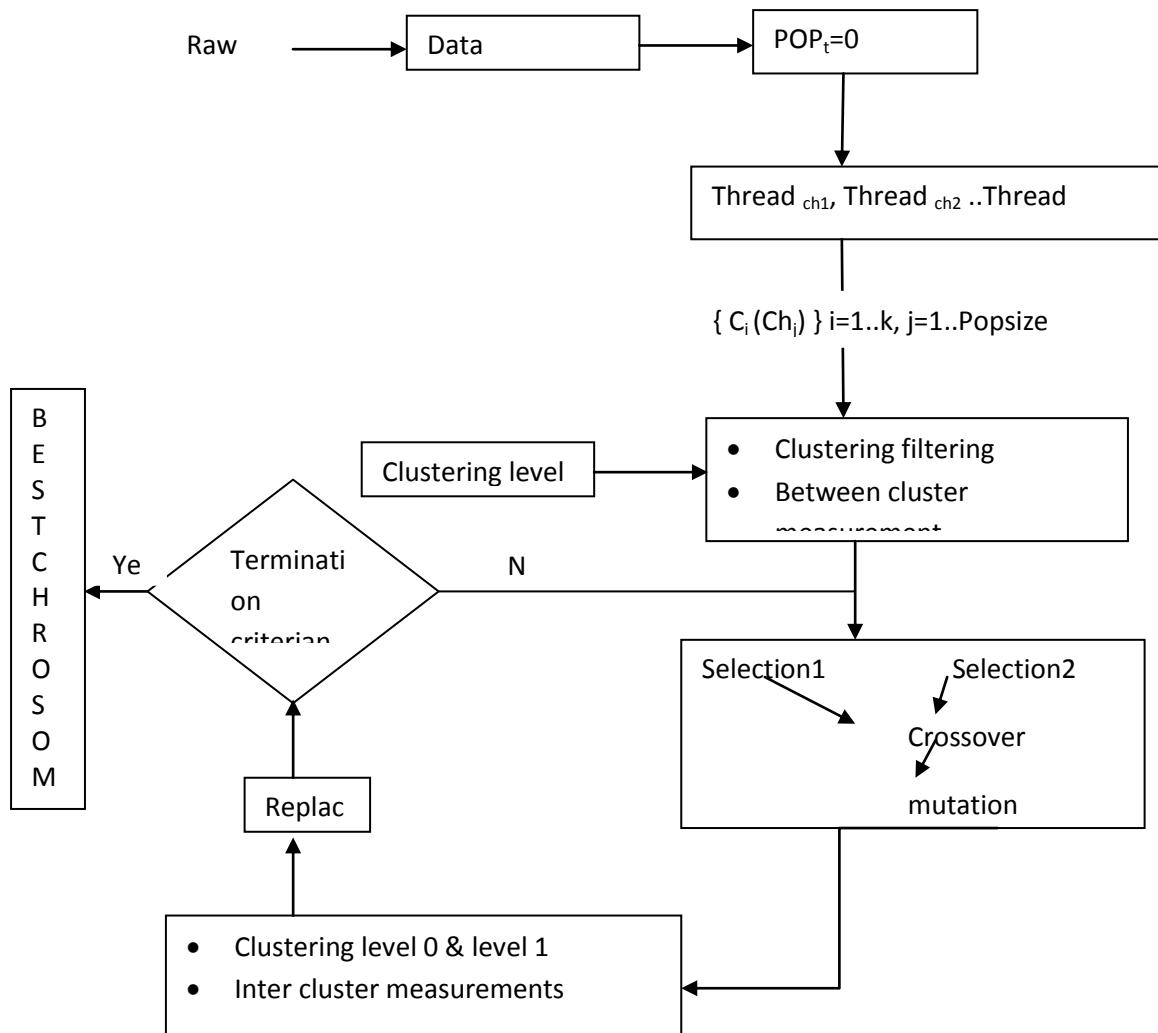
Genetic algorithm (GAs) is robust search procedure and work based on the natural solution and principles of genetics. A genetic algorithm starts with chromosomes. The string codification would be bits, numbers or characters depending on nature and its attributes.

Each solution has its own fitness values while initialization of population, fitness value assigned and new generation created through applying genetic operator such as selection and crossover and mutation. This process is repeated until the solution converges into optimal value or a termination criterion is met.

#### B. Clustering and genetic steps:

Codification of the chromosomes relate two four process.

- I. String codification
- II. Initial clustering
- III. Fitness function
- IV. Genetic
- V. operators



i. **String codification:**

Binary string, character string, floating point numbers and other data structure are used for chromosome representation. each and every chromosome is a collection of real numbers that indicates k cluster centroid.

p features contains the length of chromosome is equals to p\*k. Every chromosome is an object of p attributes, that are randomly picked from the data set.

ii). **Initial clustering (Level 0):**

Cluster of each cluster centroid are forming through discriminant distance. Object assigned to each cluster given below:

$Ch_n \in POP$  with  $\{C_j\}$  centroid  
 $Distance (D_i P, C_i(Ch_n)) < Distance (D_j, C_i(Ch_n))$

Euclidean distance define as

$$d_{norm} (D_i, D_j) = |(D_i - D_j)/B|$$

If data is standardized, its distance will be

$$d(D_i^p, D_j^p) = |D_i^p - D_j^p|$$

Euclidean distance make distance can be taken account for correlation between attributes.

### 3. FITNESS FUNCTION

Fitness function is used to measure the goodness of chromosome. The optimal solution will be the closest chromosome and has greatest fitness value. It evaluate the chromosome through fitness function and find out good individuals for next generations. And it discards less suited ones.

Fitness function evaluate chromosome in two levels: intrinsic and extrinsic .

#### Intrinsic level:

Filtering the clusters using a confidence interval then instance are reallocated if it represent in center.

#### Extrinsic Level:

Assessing chromosome based on its quality.

### 4. GENETIC OPERATORS

#### a) Selection:

It picks two parents cluster centroid based on fittest strategy. This helps to pickup the best individuals selected. Most popular selection method will be Roulette wheel selection, tournament selection.

#### b). Crossover:

Crossover is a process of picking two parent and producing a child from them. Genetic algorithm use this method to achieve a solution space.

c) **Mutation:**

Mutation becomes very important. It does not make a best solution to specific problem, but it make a small jump to avoid similar population.

### CONCLUSION

This paper proposes genetic clustering technique in an anomaly based IDS. Its main purpose is find-out normal homogenous partitioning and anomaly instance. Cluster find out rejected instance and calculate confidence interval. Rejected instances increase while increasing size of data set. Analyzing and decreasing rejected instance will be the future improvement in this work.

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## EMPLOYEE MOTIVATION IN THE SERVICES SECTOR: PYTHON PROGRAMMING APPROACH

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### INTRODUCTION

High productivity and better services are the long-lasting benefits of employee motivation. Motivated employees are an important asset that places great value on strengthening and maintaining the company's business and financial growth. A well-motivated employee stays with the company in every situation. In addition to the various modes of motivation, popular motivators include job design, job nature, and incentives and rewards for employees, which play a decisive role in determining employee longevity, productivity, and efficiency.

Employee motivation is not a new idea to increase the profitability of a company this idea comes since long back, due to employer and employee relations. Motivated employees increase productivity and allow a company to achieve a higher level of production. Some benefits of employee motivation are employee commitment increases, employee satisfaction get improved, progress in employee development, employee efficiency increases, workplace productivity increases, turnover, and absenteeism reduce, creativity and innovation increases, company's profile gets enhanced, qualities of a product or service is higher, improved financial performance.

Motivation is an internal strength or a kind of force that pushes employees towards performance. If there is no desire and ambition, then there is no motivation, because motivation is very much related to desire and ambition. Researchers believe that employees have intrinsic and extrinsic motivation. Intrinsic motivation means acting from the inside out and is naturally associated with happiness and interest. Extrinsic motivation works in a certain way that leads to perceived value. It is a challenge for managers and leaders to keep their people and employees satisfied and motivated. Therefore, every manager should know the requirements and needs of his employee and what they are looking for. To achieve and maintain high quality, low time, and risk win and products, employees need to be motivated and satisfied.

There are many ways through which motivated employees contribute to national growth and development. Also, employee motivation and increased job satisfaction

increase employee performance, leading to improved service delivery and economic growth. Some may think that wages are the most fundamental issue to measure employees' effort in their performance and ability. Individual performance produces better service delivery to enhance economic growth. The person who earns a higher salary should put more effort into his work and provide better public service. Motivation and employee performance lead to economic growth, as motivation motivates employee interest and promotes greater efforts for products and services that promote economic growth.

### OBJECTIVES OF THE RESEARCH

The AHP Fuzzy has been used for employee motivation in the service sector. It uses several criteria of employee motivation.

A sophisticated user-friendly computer programmer in python has been developed to capture the response of employee motivation in the service sector industry. By using this python program employee motivation become easier and quicker when the data is fuzzy.

Study the reason, why employees should be motivated, and what are the important factors to motivate employees to get maximum output.

### RESEARCH GAP

Most of the studies mentioned above showed that there were many thousands of stimuli that could be categorized. First are the internal factors including efficiency, conditions, job security, employee loyalty, performance awareness, promotion, and career development, employee engagement in decision-making, human relationships and friendly community actions, leadership, workplace, passionate work, tangible objects such as awards, certificates, gifts, and financial incentives such as bonuses. The second category is external factors such as good wages, grants, free food, accommodation, and travel expenses.

Hence, the current research aims at throwing light into the process of employee motivation in the service sector by

using python programming. My research is different from all the above because I am using python programming for employee motivation which is unique and innovative. This technique has never been used before.

### **EMPLOYEE MOTIVATION IN THE SERVICE SECTOR**

The motivating characteristics of every employee should be recognized by the manager and to increase their self-confidence they should provide some privilege after their performance because employees will be inspired to attain their target and appreciate the feeling of victory when they believe they will be awarded for their excellent work.

In the service sector, rewards for completing tasks are very important. For example, bank employees are motivated by a commission that exceeds their standard or is given a dividend when the sales rate exceeds expectations, or the manager thanks the employee for his or her early recommendation of all employees. Therefore, there are various ways in which a manager can encourage them; they should focus on the more important things that can motivate their subordinates for a long time. When employees come to see that their boss is right in their words and encourage them more effectively, they will agree to put more effort into their work.

### **RESEARCH METHODOLOGY**

**Fuzzy AHP - AHP** theory is based on certain steps of problem-solving. It is the principles of decomposition, the

synthesis of priorities, and comparative judgment. The AHP approach attempts to evaluate the effect of elements at the least position on the whole ranking.

Hierarchy is the summary of the structure of a system to study the impact on the system as a whole and their functional interactions of its components.

### **Fuzzy Sets and Fuzzy Number**

Mathematically, the fuzzy set  $A_{\tilde{A}}$  is known as membership function  $\mu_{\tilde{A}}(x)$ , which gives each X object in place of the X expression the real number in the interval zero to one.

### **Fuzzy Number**

The fuzzy intervals are described in an actual number R, the fuzzy number is demonstrated as the fuzzy set. Fuzzy intervals are expressed as  $[a_1, a_2, a_3]$  at both ends  $a_1$  and  $a_3$  and vertex  $a_2$ .

These all are fuzzy sets, and they meet the following requirement.

- normalized fuzzy set.
- convex fuzzy set
- its membership function continues one by one.
- Fuzzy number (fuzzy set) has to be convex and normalized the qualification of normalization this means the highest membership value is one there exists  $x \in R, \mu_{\tilde{A}}(x)=1$ . Fuzzy set was described as a real number.

**Table 1: Operation performed in Fuzzy Number**

A = [p <sub>1</sub> , p <sub>2</sub> ], B = [q <sub>1</sub> , q <sub>2</sub> ] for all p <sub>1</sub> , p <sub>2</sub> , q <sub>1</sub> , q <sub>2</sub> ∈ R				
(i) [p <sub>1</sub> , p <sub>2</sub> ]	Subtracted by (-)	[q <sub>1</sub> , q <sub>2</sub> ]	Equals to (=)	[p <sub>1</sub> - q <sub>2</sub> , p <sub>2</sub> - q <sub>1</sub> ]
(ii) [p <sub>1</sub> , p <sub>2</sub> ]	Added by (+)	[q <sub>1</sub> , q <sub>2</sub> ]	Equals to (=)	[p <sub>1</sub> + p <sub>2</sub> , q <sub>1</sub> + q <sub>2</sub> ]
(iii) [p <sub>1</sub> , p <sub>2</sub> ]	Divided by (/)	[q <sub>1</sub> , q <sub>2</sub> ]	Equals to (=)	[p <sub>1</sub> /q <sub>2</sub> , p <sub>2</sub> /q <sub>1</sub> ]
(iv) [p <sub>1</sub> , p <sub>2</sub> ]	Multiplied by (●)	[q <sub>1</sub> , q <sub>2</sub> ]	Equals to (=)	[p <sub>1</sub> ●q <sub>1</sub> , p <sub>2</sub> ●q <sub>2</sub> ]
(v) Inverse		[p <sub>1</sub> , p <sub>2</sub> ] <sup>-1</sup>	Equals to (=)	$\left[ \frac{1}{p_2}, \frac{1}{p_1} \right]$

### **TRIANGULAR FUZZY NUMBER**

The representations of triangular fuzzy number are done by  $\tilde{A}$  and it could be determined by a triplet (u, v, w). The

membership function or truth function is represented by  $\mu_{\tilde{A}}(X)$  and it could be determined as

$$\mu_{\tilde{A}}(X) = \begin{cases} \frac{x-u}{v-u} & u \leq x \leq v \\ \frac{x-w}{v-w} & v \leq x \leq w \\ 0 & \text{otherwise} \end{cases}$$

### **FACTORS FOR EMPLOYEE MOTIVATION**

#### **1. Reward and recognition**

Reward and recognition is an important factor for the motivation. A reward is given to the employees who make efforts to achieve the objective of the organization. The reward can be given in two ways monetary and non-

monetary. Recognition is to appreciate or praise the good work of employees.

The lifespan of recognition is limited; if recognition is not associated with reward its value will be reduced.

## 2. Development

Development is essential for motivating employees. Development helps the employees to improve their skills, knowledge, etc. to achieve the ultimate objective of the organization. It also makes employees self-reliant. When the manager shows genuine interest in their development, employees appreciate and value them; it shows that the organization trust the employee and want growth of the employees within the organization.

## 3. Leadership

A good leader can influence the employee for performing in the right manner. A great leader knows what motivates employees, how to inspire, encourage, and have a clear vision. A leader must have the right expectations, give credit, and congratulate their employees.

## 4. Work-life balance

Balancing between personal and professional life is known as work-life balance. Work-life balance try to schedule the time for work and various activities. If employees do not have a balance in a healthy lifestyle, they feel less motivated.

## 5. Work environment

The work environment is a surrounding in which the employees do their work. Day-to-day productivity is affected by all the elements of working environments, including the steps that should be taken to complete the work. There are three aspects of the work environment these are- physical environment, company culture, and

working conditions. By concentrating on the whole working culture, support the growth of employees, and maintaining the employee's safety positive work environment of an organization can be achieved.

## FUZZY ANALYTICAL HIERARCHY PROCESS (FAHP)

Zadeh (1965) and Bellman and Zadeh (1970) have discovered the introduced approach Fuzzy set theory that is termed as the method of decision making in a fuzzy surrounding. Saaty (1980) has suggested the AHP, which is described as a method of multi-criteria decision making for an unorganized and complex issue that uses a structural (ranking) pattern having levels of criteria, alternatives, possible sub-criteria, goals. Any of the multiple Criteria Decision Making (MCDM) methods fuzzy is known as the (AHP) Analytical Hierarchy Process. The fuzzy Analytical Hierarchy Process depends on the fuzzy (vague) concept suggested by Lofti Zadeh. Fuzzy sets and logic are uncertain systems of powerful mathematical tools in many economic, social, and economic fields. This applies to various applications such as logistics, transport, city designing, marketing, public political affairs, education, finance; this broad application area is the part of economics. The FAHP's best approach is that when examiners compute each environmental product of the design with different linguistic terms (e.g. high, very high), criteria, or instead of providing a correct numerical value fuzzy number can be assigned. The Triangular fuzzy numbers have been applied in this paper. The three actual numbers known as Triangular fuzzy number  $\tilde{N}$  expressed as (L, M, and N).

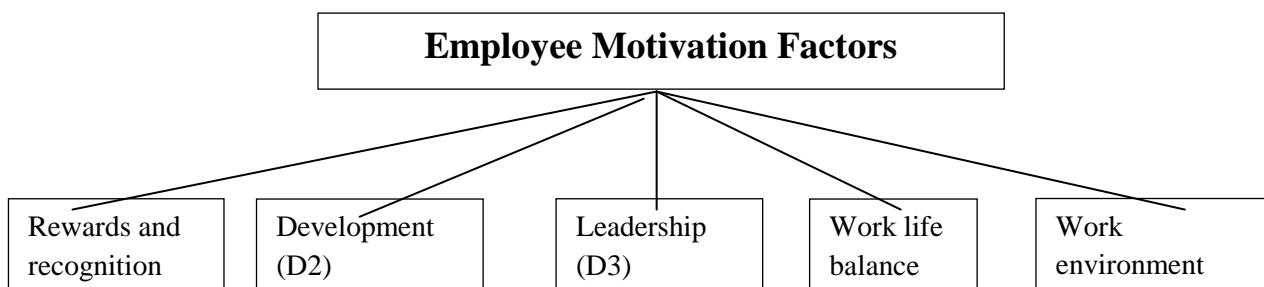


Fig. 1: Hierarchical Structure

## STEP 1. PERFORMANCE SCORE WILL BE COMPARED

To denote the comparative strength of every single pair of elements in the corresponding hierarchy ( $\tilde{1}, \tilde{3}, \tilde{5}, \tilde{7}, \tilde{9}$ ) the triangular fuzzy numbers are used. Make a comparison of

alternatives and the criteria using a linguistic variable. The following table lists the equivalent triangular fuzzy numbers and linguistic variable.

**Table 2: Membership Function belonging to Fuzzy Number.**

LINGUISTIC VARIABLE	TRIANGULAR FUZZY NUMBER
VALUABLE	(9, 9, 9)
VERY STRONGLY VALUABLE	(6, 7, 8)
STRONGLY VALUABLE	(4, 5, 6)
FAIRLY VALUABLE	(2, 3, 4)
EQUALLY VALUABLE	(1, 1, 1)

## STEP 2: CONSTRUCTING THE FUZZY COMPARISON MATRIX:

Comparison matrix is  $\tilde{M}$ , where the priorities (comparative value) of the  $i^{\text{th}}$  criterion over the  $j^{\text{th}}$  criterion are represented

$$\tilde{M} = \begin{bmatrix} \tilde{m}_{11} & \tilde{m}_{12} & \cdots & \cdots & \tilde{m}_{1n} \\ \tilde{m}_{21} & \tilde{m}_{22} & \cdots & \cdots & \tilde{m}_{2n} \\ \cdots & \cdots & \cdots & \cdots & \cdots \\ \cdots & \cdots & \cdots & \cdots & \cdots \\ \tilde{m}_{n1} & \tilde{m}_{n2} & \cdots & \cdots & \tilde{m}_{nn} \end{bmatrix}$$

## STEP 3: GEOMETRIC MEAN BELONGING TO FUZZY COMPARISON VALUES OF EVERY SINGLE CRITERION.

The geometric mean concerning fuzzy comparison values of every single scale is calculated as follows, where  $\tilde{G}_i$  represents a triangular number.

$$\tilde{G}_i = (\prod_{k=1}^n A_k)^{1/n} \text{ where } i \text{ is; } i = 1, 2, 3, \dots, n. \quad (1)$$

## STEP 4: FUZZY WEIGHTS OF EVERY SINGLE CRITERION

To find the fuzzy weight of criteria  $\tilde{w}_i$  multiply every single  $\tilde{G}_i$  with this reverse vector. Weight of every single criterion  $= \tilde{G}_1 \otimes (\tilde{G}_1 \oplus \tilde{G}_2 \oplus \tilde{G}_3 \dots \oplus \tilde{G}_N)^{-1}$

$$(i.e.) \quad \tilde{w}_i = (Lw_i, Mw_i, Nw_i). \quad (2)$$

## STEP 5: NORMALIZATION OF THE MATRICES

Normalization is calculated by paired comparison matrix according to criterion weights, and before calculating the criterion weights and matrices to get alternant for every single criterion are also done. The measure of inconsistency is known as the consistency index (CI) and the variance from consistency is given by the following equation.

$$CI = \frac{\lambda_{\max} - n}{n-1}$$

by  $\tilde{m}_{ij}$  through triangular fuzzy numbers. Triangular number demonstration is denoted by  $(\sim)$ . For example, the priority of 3<sup>rd</sup> criterion over 2<sup>nd</sup> criterion is denoted by  $\tilde{m}_{32}$ .

## STEP 6: CALCULATION FOR EVERY SINGLE ALTERNATIVE

To find the criterion weights of every single alternative multiply the matrix of estimate ranking by the vector of priority weights and adding overall criteria. Denoted with the standard mathematical statement.

Weighted assessment for alternatives  $K = \sum_{i=1}^n$  priority weight  $i^*$  assessment rating ie,  $i$  equals to (=) 1, 2 ... n. where n is a total number of criteria. After evaluating the weight for every single alternative, the determined total consistency index for all judgments is that it should be less than 10% (< 0.1).

## RESULT AND DISCUSSION

Fuzzy AHP methodology has been introduced in this paper. Under every single criterion is paired off for alternatives and criteria are made by decision-makers. According to the geometric mean approach these comparable values were converted into triangular fuzzy numbers. The model was tested in Tata Motors, Lucknow. The primary data was collected from the experts.

## WEIGHTS OF CRITERIA

According to the expert's opinion, the pairwise comparison matrix of the criterion is given below.

Table 3: Fuzzy Comparing Matrix of Criterion is related to the Overall Objective

Criterion	Rewards and recognition	Development	Leadership	Work-life balance	Work environment
Rewards and recognition	(1,1,1)	(1,1,1)	(2,3,4)	(1/6,1/5,1/4)	(4,5,6)
Development	(1,1,1)	(1,1,1)	(6,7,8)	(1,1,1)	(6,7,8)
Leadership	(1/4,1/3,1/2)	(1/8,1/7,1/6)	(1,1,1)	(1/6,1/5,1/4)	(2,3,4)
Work life balance	(4,5,6)	(1,1,1)	(4,5,6)	(1,1,1)	(6,7,8)
Work environment	(1/6,1/5,1/4)	(1/8,1/7,1/6)	(1/4,1/3,1/2)	(1/8,1/7,1/6)	(1,1,1)

Through equation (1) we can compute the geometric mean of fuzzy comparability of every single criterion. In the above table,  $\tilde{G}_1$  is a geometric mean of fuzzy comparable

values for rewards and recognition criteria is determined as below

$$\begin{aligned} \tilde{G}_1 &= (\prod_{j=1}^n m_{1j})^{\frac{1}{n}} = \left[ \left( 1 * 1 * 2 * \frac{1}{6} * 4 \right)^{\frac{1}{5}}; \left( 1 * 1 * 3 * \frac{1}{5} * 5 \right)^{\frac{1}{5}}; \left( 1 * 1 * 4 * \frac{1}{4} * 6 \right)^{\frac{1}{5}} \right] \\ &= [1.0592; 1.2457; 1.4310] \end{aligned}$$

The geometric mean of all criteria is shown in table (4)

**Table 4: For All Criterion, the Geometric Mean of Fuzzy Comparison's Values is**

	Gi		
F1	1.0592	1.2457	1.4310
F2	2.0477	2.1779	2.2974
F3	0.4884	0.4911	0.6598
F4	2.4915	2.8094	3.1037
F5	0.2305	0.3342	0.3222
Total	6.3172	7.0583	7.8140
Reverse	0.1583	0.1417	0.1280
Increase	0.1280	0.1417	0.1583

Now consider the fuzzy weight of the D1 criterion  $\widetilde{w}_1$  is given by the equation (2)

$$\widetilde{w}_1 = [(1.0592 * 0.128); (1.2457 * 0.14); (1.4310 * 0.158)]$$

$$= [0.1356; 0.1765; 0.2265]$$

$$NM_1 = \frac{0.1356 + 0.1765 + 0.2265}{3} = 0.1795$$

**Table 5: For Every Single Criteria Fuzzy Weight( $\widetilde{W}_i$ ), Normalized Weight (Ni), Non-Fuzzy Weight (NMi) are:**

	Wi			NMi	Ni
F1	0.1356	0.1765	0.2265	0.1795	0.1768
F2	0.2621	0.3086	0.3637	0.3114	0.3068
F3	0.0625	0.0696	0.1044	0.0788	0.0777
F4	0.3188	0.3980	0.4913	0.4027	0.3967
F5	0.0295	0.0473	0.0510	0.0426	0.0420
Total				1.0151	

In the above table (5),  $N_1$  is calculated by

$$N_1 = \frac{NM_1}{\sum_{i=1}^n NM_i} = \frac{0.1795}{1.0151} = 0.1768$$

#### Weights of Alternatives related to Criterion.

Now the pair-wise comparisons of the alternatives are related to every single criterion. Let  $R_1, R_2, R_3$  are three locations around Lucknow.

**Table 6: Fuzzy Comparability of Alternatives relative to D1**

Alternatives	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>
R <sub>1</sub>	(1,1,1)	(8,7,6)	(4,3,2)
R <sub>2</sub>	(1/6,1/7,1/8)	(1,1,1)	(1/2,1/3,1/4)
R <sub>3</sub>	(1/2,1/3,1/4)	(4,3,2)	(1,1,1)

Regarding "Rewards and recognition criteria" the geometric mean of comparing the value of alternatives is shown below the table.

**Table 7: Geometric Mean ( $\widetilde{G}_i$ ) of Fuzzy Comparing Values of Alternatives is relative to (D1) Criteria.**

	Gi		
R <sub>1</sub>	2.2894	2.7589	3.1748
R <sub>2</sub>	0.3150	0.4368	0.4368
R <sub>3</sub>	0.7937	1.0000	1.2599
Total	3.3981	4.1957	4.8715
Reverse	0.2943	0.2383	0.2053
Increase	0.2053	0.2383	0.2943

Now consider the fuzzy weight, non-fuzzy weight, normalized weight is shown in table (8).

**Table 8: Fuzzy Weight( $\widetilde{w}_i$ ), Normalized Weights (Ni), Non-fuzzy Weight (NMi), of Every single Alternative is relative to D1 Criteria.**

	Wi			NMi	Ni
R <sub>1</sub>	0.4700	0.6576	0.9343	0.6873	0.6585
R <sub>2</sub>	0.0647	0.1041	0.1285	0.0991	0.0949
R <sub>3</sub>	0.1629	0.2383	0.3708	0.2573	0.2466
Total				1.0437	

Now consider fuzzy comparability of alternative is relative to "Development" is shown in below the table (9).

**Table 9: Fuzzy Comparability of Alternatives is relative to D2**

Alternatives	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>
R <sub>1</sub>	(1,1,1)	(1/4,1/5,1/6)	(1/6,1/7,1/8)
R <sub>2</sub>	(6,5,4)	(1,1,1)	(1/4,1/5,1/6)
R <sub>3</sub>	(8,7,6)	(6,5,4)	(1,1,1)

Now consider fuzzy comparability of alternatives relative to “Leadership” is shown in table (10)

Table 10: Fuzzy Comparability of Alternatives relative to D3

Alternatives	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>
R <sub>1</sub>	(1,1,1)	(1/2,1/3,1/4)	(1/4,1/5,1/6)
R <sub>2</sub>	(4,3,2)	(1,1,1)	(1/2,1/3,1/4)
R <sub>3</sub>	(6,5,4)	(4,3,2)	(1,1,1)

Now consider fuzzy comparability of alternatives relative to “Work-life balance” is shown in table (11)

Table 11: Fuzzy Comparability of Alternatives relative to D4

Alternatives	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>
R <sub>1</sub>	(1,1,1)	(8,7,6)	(1,1,1)
R <sub>2</sub>	(1/6,1/7,1/8)	(1,1,1)	(1/6,1/7,1/8)
R <sub>3</sub>	(1,1,1)	(8,7,6)	(1,1,1)

Now consider fuzzy comparability of alternatives relative to “Work environment” is shown in table (12)

Table 12: Fuzzy Comparability of Alternatives relative to D5

Alternatives	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>
R <sub>1</sub>	(1,1,1)	(4,5,4)	(1/4,1/5,1/6)
R <sub>2</sub>	(1/4,1/5,1/6)	(1,1,1)	(1/6,1/7,1/8)
R <sub>3</sub>	(6,5,4)	(8,7,6)	(1,1,1)

Relative weights of each alternative regarding each criterion calculated values are shown in the table (13).

Table 13: Regarding each Criteria Weights of Every Single Alternative are

	WEIGHT	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>
D1	0.1768	0.6585	0.0949	0.2466
D2	0.3068	0.0675	0.2200	0.7125
D3	0.0777	0.1073	0.2632	0.6295
D4	0.3967	0.4663	0.0673	0.4663
D5	0.0420	0.2200	0.0675	0.7125
<b>AGGREGATED RESULTS</b>		0.3397	0.1343	0.5260

According to every single criterion aggregated results of each alternative are determined. A score of the first alternative through table no (13) is.

$$R_1 = (0.1768 \times 0.6585) + (0.3068 \times 0.0675) + (0.0777 \times 0.1073) + (0.3967 \times 0.4663) + (0.0420 \times 0.2200) = 0.3397$$

Table 14: Scores of the Alternatives

Alternatives	Scores	Rank
R <sub>1</sub>	0.3397	2
R <sub>2</sub>	0.1343	3
R <sub>3</sub>	0.5260	1

According to the scores of alternatives, the 3rd alternative has the maximum score. So it is concluded that R<sub>3</sub> is the best motivation factor concerning all five criteria.

priorities of choice is an effective tool for defining priorities. The top alternative is determined by the priority weights of alternatives and criteria.

## CONCLUSION

The proposed methodology fuzzy AHP is playing an important role in multiple criteria decision making under uncertainty. It is used to measure the relative weight of the employee motivation factor. Empirical surveys were conducted using a fuzzy AHP approach to analyze the importance weight of risk factors on employee motivation. Initially, Lucknow and around the area were surveyed, for best employee motivation. In our model procedure, all alternatives are pairwise compared based on each attribute separately. The comparisons between alternatives are carried out by experts' opinions and oral group decision-making. The oral judgment of group ability related to the

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