

COMPARISON OF PREDICTIVE MODELS USING LINEAR REGRESSION AND LOCAL LEAF NODE REGRESSION

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ABSTRACT

The Multiple Linear regression is most common technique incorporated in traditional statistics. Usually, this regression method is applicable when the dependent variable is of continuous in nature. In the field of Statistics and Machine learning, decision tree is used for splitting the data into new subset with homogeneity in nature. Here, the outcome variable is continuous variable hence regression tree algorithm is used for splitting data. A new subsets or leaves are obtained from regression tree.

A large dataset is taken from UCI (Machine learning Repository) incorporated for this research work. In this paper, we are focusing on the concepts of Linear regression, Regression tree. We use linear regression and regression tree to develop a Local leaf node regression. In this study we compare linear regression, regression tree and Local Leaf node regression on the basis of Mean Sum of Square (M.S.E.). We observed that Local Leaf node regression gives better results than traditional linear regression.

Keywords: Multiple Linear regression, CART, Regression tree, Local leaf node regression, Mean Sum of Square (M.S.E.).

Introduction

The data mining techniques incorporates machine learning algorithm to extract valuable information from collected data. The machine learning is very closely associated with data mining and predictive modelling. The machine learning techniques are techniques which combines collected data with some statistical tools for predicting the output. This output is utilized to predict decisions in corporate, forecasting, claiming a policy in insurance, retailing and loans in banking sector [1] [2]. In machine learning most of research has been occurred for Classification and Regression which are mainly used in predictive modelling. If the output variable is categorical variable then Classification technique is incorporated and if it is continuous variable then Regression techniques is applied. In fact, most of research is focused on classification and regression problems.

Generally, If the outcome variable is continuous type then Linear regression method is used.

Multiple linear regression:

If there are more than one independent variable and single dependent variable then it is called multi variable regression or multiple regression. It also states that the value of y differs with a constant rate of the value of change of any independent variable and it is given by,

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \epsilon_{ij} \dots \dots \dots (1)$$

Where, Y is the dependent or response variable, α is the intercept, X_1, X_2, \dots, X_n are the independent variables, $\beta_1, \beta_2, \dots, \beta_n$ is the coefficients of independent variables or unknown constants and ϵ_{ij} is the error term [3].

Regression tree:

Classification and Regression Tree (CART) method was firstly develop by Breiman et al [4]. In Machine Learning, Decision tree is commonly called as CART algorithm as it builds for both purposes namely, for classification and regression. If the variable is in form of categorical then use classification tree methodology and if the variable is in form of continuous then use regression tree. This tree algorithm has non-parametric approach and has ability to handle missing data. There is no requirement of additional input constraints in regression tree as compared to another techniques. A regression tree analysis is an advanced and innovative technique and applied for solving engineering problems in several arenas of science and engineering such as epidemiology, software engineering, production management, fisheries management, criminology, information technology [5][6][7][8]. The decision tree deals effectively with high dimensionality taking variables on its high priority [9]. This type of decision tree or regression tree is including



Roots, Leaves, Branches and Nodes. Generally, nodes are represented by circles, branches are represented as associations between nodes. In the terminology, a variable is selected as first node as root node and then it is divided into various internal nodes built on homogeneity. It is top-to-down structured where root is placed at the top. At the last stage of tree, a chain is formed of root, branch and node is referred as Leaf [10]. These trees are constantly used for easy description, understanding, interpreting and visualization of results. Basically, regression tree is formed by using binary recursive partitioning. Recursive partitioning is an iterative method where data is splitted into small partitions or branches. Each splitting partition is selected on the basis of minimum mean sum of square among all partitions [11].

In this paper, using linear regression and regression tree we develop a Local leaf node regression and compare this model with linear regression and regression tree on the basis of Mean Sum of Square (M.S.E.). We also identified the accurate predicted models for each leaf nodes of regression tree.

Methodology

Local Leaf Node regression:

In the predictive analysis, the researchers have first choice is regression analysis and traditional linear regression method. Generally, linear regression is applied on whole data and making a single global prediction model. The Linear regression has global approach in which a single predictive model belongs to entire data. When this data has a many feature and these features are interacted with complicated and nonlinear

ways, then a single global model becomes very difficult and quite confusing. An alternative method is to divide or partition the data into smaller subsets in which interactions are quite manageable. We partition the data into many sub divisions or small subsets is called recursive partitioning [12]. In real life situations, due to large expansion of data, it occurs in heterogeneous in nature. So, the traditional method was not able to predict values correctly as data is in heterogeneous. To remove this heterogeneity or error from data, split the data using decision regression tree. A regression tree is grown on whole datasets, terminal nodes are obtained. These terminal nodes show more homogeneous group as compared to whole population. The study focuses on terminal nodes as compared to root node. At this terminal node, homogeneous data as subset is obtained. From this subset we identify observations of that homogeneous groups and then applying Multiple linear regression on these leaf nodes (homogeneous groups). This leaf size should be appropriate according to data. Here, appropriate means the size of leaf node is neither be less nor more and maintain homogeneity within the group. We get regression model for each terminal node. It is observed that instead of applying regression model on whole data is more accurate than applying linear regression on leaf node regression tree. This leaf node regression is referred as Local leaf node regression. Similarly, we are applied multiple linear regression on each leaf node of regression tree and calculated M.S.E. for each leaf.

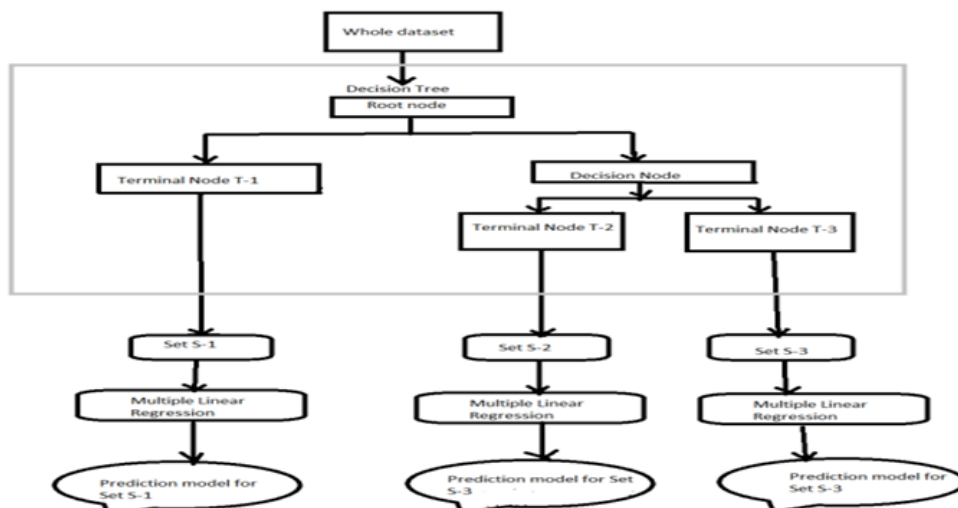


Fig.1 The structure of local leaf node linear regression



The following figure 1 showing the structure of local leaf node linear regression.

We compare the Mean Square Error (M.S.E.) of Multiple linear regression, Regression Tree and Leaf node regression. It is given by,

$$\text{Mean Square Error (M.S.E.)} = \frac{1}{N} \sum_{i=1}^{i=N} (Y_i - \hat{Y})^2 \dots\dots\dots (2)$$

Also, to develop each local leaf node linear regression model on each terminal node and compare their MSE values with traditional linear regression and Regression tree to find accurate predicted values.

In this study paper, we have used Concrete Compressive Strength dataset from a UCI Machine Learning Repository dataset. This data contains 1030 instances and 9 attributes for 8 input quantitative attributes with single

quantitative output. There is brief description of dataset having data type, measurements and description of attributes in Table-1

Sr. No.	Variable Name	Type of variable	Measurement unit	Description
1	Cement	Quantitative	kg in a m3 mixture	Input variable
2	Blast Furnace Slag	Quantitative	kg in a m3 mixture	Input variable
3	Fly Ash	Quantitative	kg in a m3 mixture	Input variable
4	Water	Quantitative	kg in a m3 mixture	Input variable
5	Superplasticizer	Quantitative	kg in a m3 mixture	Input variable
6	Coarse Aggregate	Quantitative	kg in a m3 mixture	Input variable
7	Fine Aggregate	Quantitative	kg in a m3 mixture	Input variable
8	Age	Quantitative	Day (1~365)	Input variable
9	Concrete compressive strength	Quantitative	Mpa	Output variable

Table-1 Brief description of dataset with measurement

In this study, we have taken Input variables are independent variables and Output variable as dependent or response variable. Here, concrete compressive strength is the dependent or response variable for regression analysis. All the statistical analysis has been carried out by using R software with caret package. A popular classical statistical method namely, Multiple regression analysis is carried out by considering concrete compressive strength as response variable and rest of all are independent variables. In the analysis all the P-values are less than or equal to 0.05 Hence all the independent variables are statistically significant with 95% and final multiple regression model is obtained. The MSE is measured and calculated using R software. Table-2 depicts the result of final Multiple regression analysis with significant variables and M.S.E.

On the other hand, A regression tree has grown

as top-to-down manner by considering root node. This tree algorithm is obtained by using R-part package in R software. The performance measure such as MSE is calculated for regression tree. The Fig.1 depicts the regression tree. The Table-3 shows the summarized result of the multiple Linear models for each tree leaf and M.S.E value for each tree leaves.

Result and Discussion

The model was implemented in R software version 3.5.3 and results were obtained. The Multiple linear regression is applied on data and final model is obtained. The M.S.E. is calculated for whole data by using previous formula. The following Table-2 shows the result of analysis using Multiple Linear regression and M.S.E.



Table-2 depicts the result of final Multiple regression analysis with significant variables and M.S.E.

Independent variables	Estimates	Standard Error	t-value	P-value
Regression Coefficients (β)				
Cement	0.1197	0.0084	14.110	< 2e-16
Blast Furnace Slag	0.103847	0.0101	10.245	< 2e-16
Fly Ash	0.087943	0.0126	6.988	5.03e-12
Water	-0.15029	0.0402	-3.741	0.000194
Superplasticizer	0.290687	0.0935	3.110	0.001921
Coarse Aggregate	0.018030	0.0094	1.919	0.055227
Fine Aggregate	0.020154	0.0107	1.883	0.059968
Age				
Intercept (α)	-23.1637	26.5884	-0.871	0.3838
Multiple R-squared	0.6155			
Residual deviance	10.4			
Adjusted R squared	0.6125			
F-statistic	204.3			
Mean Square Error (M.S.E.)	107.2118			

The final Multiple linear regression model becomes,
 Concrete compressive strength

$$\begin{aligned}
 &= -23.1637 + 0.1197 * \text{Cement} \\
 &+ 0.103847 \\
 &* \text{Blast Furnace Slag} \\
 &+ 0.087943 * \text{Fly Ash} \\
 &- 0.15029 * \text{Water} + 0.290687 \\
 &* \text{Superplasticizer} \\
 &+ 0.018030 \\
 &* \text{Coarse Aggregate} \\
 &+ 0.020154 * \text{Fine Aggregate} \\
 &+ 0.114226 * \text{Age}
 \end{aligned}$$

The following figure-2 shows the regression tree which contains 13 Terminal nodes with Root node as Age.

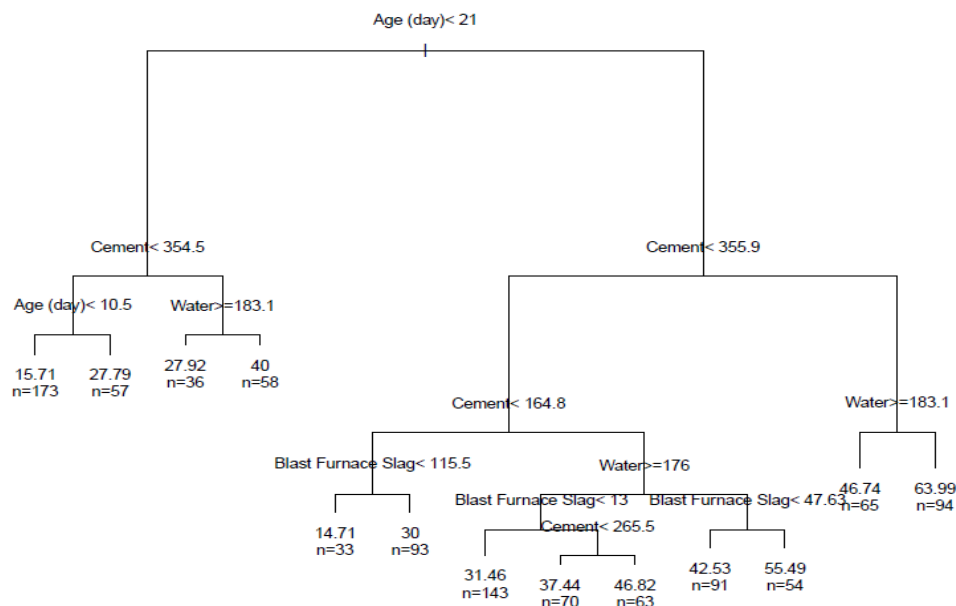


Fig.2 Regression tree.



In the above regression tree, it has total 107 nodes in which 94 internal nodes and 13 terminal nodes. For growing a regression tree, root node considered as entire dataset of 1030 cases. The splits are chosen by the rank of all the variables. In this tree, the variable “Cement” contributes more so it takes for splitting firstly, then according to importance of remaining variables they are used for splitting. The order of remaining variables are as follows, Cement, Age, Water, Superplasticizer, Blast Furnace Slag, Fine Aggregate, Coarse Aggregate and Fly Ash. For every internal node, there are two types of splits are given such as, primary splits and surrogate splits. The total number of instances and mean sum of square is given for every internal and terminal node. In the regression tree minimum value of mean sum of square for a variable is considered for splitting the variable. This tree has

13 terminal nodes or leaf nodes or subgroups. Then the observations can be identified from each leaf nodes of regression tree. Once the observations are obtained then applying linear regression on each leaf node we get Local leaf node regression. The local leaf node regression model of each node and corresponding M.S.E. values are given in following table-3.

Table-3 shows the summarized result of the multiple Linear models for each subsets and M.S.E value for each node.

Sr. No	Leaf nodes	M.S.E.	Local Leaf node Regression
1	leaf node 1	11.8705	$Concrete\ compressive\ strength = 21.354895 + 0.068277$ $*\ Cement + 0.027701$ $*\ Blast\ Furnace\ Slag + 0.025017 * Fly\ Ash$ $- 0.060174 * Water$ $+ 0.708840 * Superplasticizer$ $- 0.013054$ $*\ Coarse\ Aggregate$ $- 0.012877 * Fine\ Aggregate$ $+ 1.420071 * Age$
2	leaf node 2	13.1916	$Concrete\ compressive\ strength = -120.2746 + 0.19989$ $*\ Cement + 0.16862$ $*\ Blast\ Furnace\ Slag + 0.13459 * Fly\ Ash - 0.03607$ $*\ Water + 0.46174$ $*\ Superplasticizer + 0.03425$ $*\ Coarse\ Aggregate - 0.06517$ $*\ Fine\ Aggregate$

3	leaf node 3	16.6573	<p>Concrete compressive strength = $134.1846 + 0.04798$ $* \text{Cement} + 0.005294$ $* \text{Blast Furnace Slag} - 0.057467 * \text{Fly Ash}$ $- 0.170753 * \text{Water} + 1.340939 * \text{Superplasticizer}$ $- 0.046255 * \text{Coarse Aggregate}$ $- 0.083045 * \text{Fine Aggregate} + 1.620760 * \text{Age}$</p>
4	leaf node 4	29.1286	<p>Concrete compressive strength = $-164.00356 + 0.20923$ $* \text{Cement} + 0.19980 * \text{Blast Furnace Slag}$ $+ 0.15281 * \text{Fly Ash} - 0.13775 * \text{Water} - 0.19812$ $* \text{Superplasticizer} + 0.05589 * \text{Coarse Aggregate} + 0.06531$ $* \text{Fine Aggregate} + 2.92440 * \text{Age}$</p>
5	leaf node 5	1.6786	<p>Concrete compressive strength = $-280.433 + 0.15875$ $* \text{Cement} + 0.20191 * \text{Blast Furnace Slag}$ $+ 0.15028 * \text{Fly Ash} + 0.16175 * \text{Water} + 0.26435$ $* \text{Superplasticizer} + 0.11963 * \text{Coarse Aggregate} + 0.11993$ $* \text{Fine Aggregate} + 0.12754 * \text{Age}$</p>
6	leaf node 6	24.2484	<p>Concrete compressive strength = $30.71432 - 0.02090$ $* \text{Cement} + 0.11067 * \text{Blast Furnace Slag}$ $+ 0.03476 * \text{Fly Ash} - 0.08632 * \text{Water} + 0.17954$ $* \text{Superplasticizer} - 0.01169 * \text{Coarse Aggregate} + 0.00382$ $* \text{Fine Aggregate} + 0.07562 * \text{Age}$</p>
7	leaf node 7	16.9471	<p>Concrete compressive strength = $-122.9 + 0.1819 * \text{Cement}$ $- 0.5260 * \text{Blast Furnace Slag} + 0.1736 * \text{Fly Ash} - 0.07877$ $* \text{Water} - 0.2343 * \text{Superplasticizer} + 0.04344$ $* \text{Coarse Aggregate} + 0.08025 * \text{Fine Aggregate} + 0.03593$ $* \text{Age}$</p>



8	leaf node 8	45.3595	<p><i>Concrete compressive strength</i> $= -206.411 + 0.08753$ $* \text{Cement} + 0.10323$ $* \text{Blast Furnace Slag}$ $+ 0.07798 * \text{Fly Ash} + 0.23835$ $* \text{Water} + 0.86578$ $* \text{Superplasticizer} + 0.09238$ $* \text{Coarse Aggregate} + 0.08650$ $* \text{Fine Aggregate} + 0.05902$ $* \text{Age}$</p>
9	leaf node 9	54.1080	<p><i>Concrete compressive strength</i> $= -67.0759 + 0.107447$ $* \text{Cement} + 0.082128$ $* \text{Blast Furnace Slag}$ $+ 0.031638 * \text{Fly Ash}$ $+ 0.16659 * \text{Water} + 0.741105$ $* \text{Superplasticizer} - 0.003536$ $* \text{Coarse Aggregate}$ $+ 0.046913 * \text{Fine Aggregate}$ $+ 0.040387 * \text{Age}$</p>
10	leaf node 10	27.8297	<p><i>Concrete compressive strength</i> $= -243.3544 + 0.1987$ $* \text{Cement} + 0.0969$ $* \text{Blast Furnace Slag}$ $+ 0.18129 * \text{Fly Ash} + 0.08731$ $* \text{Water} + 0.72839$ $* \text{Superplasticizer} + 0.10628$ $* \text{Coarse Aggregate} + 0.09358$ $* \text{Fine Aggregate} + 0.17081$ $* \text{Age}$</p>
11	leaf node 11	52.2158	<p><i>Concrete compressive strength</i> $= -306.1342 + 0.245 * \text{Cement}$ $+ 0.17863$ $* \text{Blast Furnace Slag}$ $+ 0.22232 * \text{Fly Ash} + 0.10383$ $* \text{Water} - 0.77052$ $* \text{Superplasticizer} + 0.12921$ $* \text{Coarse Aggregate} + 0.15244$ $* \text{Fine Aggregate} + 0.13311$ $* \text{Age}$</p>
12	leaf node 12	41.8808	<p><i>Concrete compressive strength</i> $= -36.0782 + 0.130107$ $* \text{Cement} + 0.11506$ $* \text{Blast Furnace Slag}$ $+ 0.047276 * \text{Fly Ash}$ $- 0.091739 * \text{Water} + 0.43236$ $* \text{Superplasticizer} + 0.002878$ $* \text{Coarse Aggregate}$ $+ 0.050196 * \text{Fine Aggregate}$ $+ 0.041980 * \text{Age}$</p>



13	leaf node 13	51.7864	<p><i>Concrete compressive strength</i> $= -13.2736 + 0.13129$ $* \text{Cement} + 0.18222$ $* \text{Blast Furnace Slag}$ $+ 0.11756 * \text{Fly Ash} - 0.21123$ $* \text{Water} - 0.58137$ $* \text{Superplasticizer} + 0.02315$ $* \text{Coarse Aggregate} + 0.02529$ $* \text{Fine Aggregate} + 0.05855$ $* \text{Age}$</p>
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Using Multiple linear regression for entire data the M.S.E. is obtained as 107.2118 and using regression tree, the M.S.E. value is 72.4042. By observing M.S.E of nodes we can say that M.S.E. of each local leaf node regression is less than M.S.E. of Multiple linear regression and M.S.E of regression tree.

Conclusion:

In the Machine Learning and traditional statistics, Multiple linear regression method is very important in many predictive modelling applications. The error is obtained more due to

applying linear regression on whole dataset. To reduce the error, it is necessary to divided dataset into more subsets according to its homogeneity using regression tree. Multiple linear regression is applied on each terminal node and obtained Local leaf node regression for each node. This study observed that each leaf node regression models gives best linear regression model with less MSE than multiple linear regression. As a result, the study has suggested that instead of taking multiple linear regression for the whole dataset, use local leaf node regression for subset or leaves from regression tree.

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EQUITY RESEARCH ANALYSIS OF SELECTED PUBLIC SECTOR BANKS

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ABSTRACT

This paper covers the equity research on selected Indian public sector banks. Equity share is generally described as a common stock, which constitutes a partial ownership as the shareholder undertakes the equal business risk of the enterprise. The main purposes of this paper were to examine how the fundamental analysis helps in arriving at an investment decision, to study the trend in the stock of banks and the volatility in their stock prices. In India, individuals are appreciating that common stock has ability to provide the attractive returns in comparison with rest of the investing opportunities. Nevertheless people are unaware about valuation of equity, they just put money in equity shares after considering the suggestions given by brokers, friends or family members. It is not considered as investment in equity shares rather it is obvious gambling and risking money which majority of the investors do not wish to. Equity valuation starts with analyzing the particular sector where the investment has to be made. If the sector at all is feasible, then analysis of several players in the sector needs to be done. After sectorial and competitors' analysis is done, then the specific company analysis should be done using fundamental analysis to evaluate its performance and financial strength. This paper starts with the analysis of the fundamentals i.e. EIC-economy, industrial and company evaluation of the selected banks. i.e SBI and PNB. The selected companies were evaluated based on both qualitative and quantitative aspects. The stock price besides P/E ratio partake been considered to compute EPS. Once the end value is calculated, the variation was shown between calculated amount and the then current market price to draw the conclusion about top performing company. Lastly, conclusion and suggestions are prearranged on the basis of the result.

Keywords: Public Sector Banks, Investment Decision, Stock Prices, Quantitative Aspects, EIC-economy

Introduction

An equity share is normally stated as a common stock also. The shareholders are considered as owners of that company and they have the right to vote.

How The Investment To Be Made In Equity Shares?

Stockholders may purchase the shares of a company through financial market either primary or secondary. Primary market is that which provides a way of selling securities which are issued for the first time. It also provides opportunities for issuers of securities, both public sector entities and private sector entities, to raise finances to fulfill their investing needs.

People can purchase shares of a company in case of the shares are issued for the first time by the company and once the shares are open to the public, they are exchanged through secondary market. An investor wishes to purchase shares of

a corporate can purchase from secondary market.

Why To Make Investment In Equity Shares?

Investment made in equity shares can give shareholders two types of benefits namely- dividend and capital gains, but at the same time the investment in equity shares is considered as very risky also.

Objectives Of The Study:

1. To explain how the fundamental analysis helps in arriving at investment decision.
2. To interpret the ratios of the selected banks.
3. To offer an outline of the Indian banking sector in order to make investment decision.

Introduction Of Public Sector Banks

India is considered as one of the world's

top economies, with a massive opportunity for Indian banking sector to prosper. Over the last couple of ages, there was considerable growth in the amount of operations out of Automated Teller Machines, Net Banking and Mobile Banking.

Around 12 PSBs are located alongside the Payments banks owned by the states in India. The PSBs are very active in their turnaround efforts, whether in the field of technological adoption or the pruning of their missing funds. Retail lending, which has represented a large segment of the range of financial products of the majority of the banks, had lost some weighting on bank portfolios on account to the risk weighting. Banking sector in India is highly backed by RBI and has managed to handle much recession with relative ease, and the sector now is also foreseeing the growth and investment through Foreign Direct Investment. Current financial system in India, which has developed over many years, played extensive role in meeting finance and banking services requirements. There is various growing tiers in current financial system in order to meet the diverse and varying needs of various clients.

Government Policy For Public Sector Banking

Banks operating in most countries must comply with strict legislation, the laws imposed by central and state authorities to regulate the banking services and the way they develop and extend their

services to best provide the community. The bank is meant to offer the financial services like lending money, receive deposits and offer other services to their client.

Following are the key reasons that banks are strongly controlled:

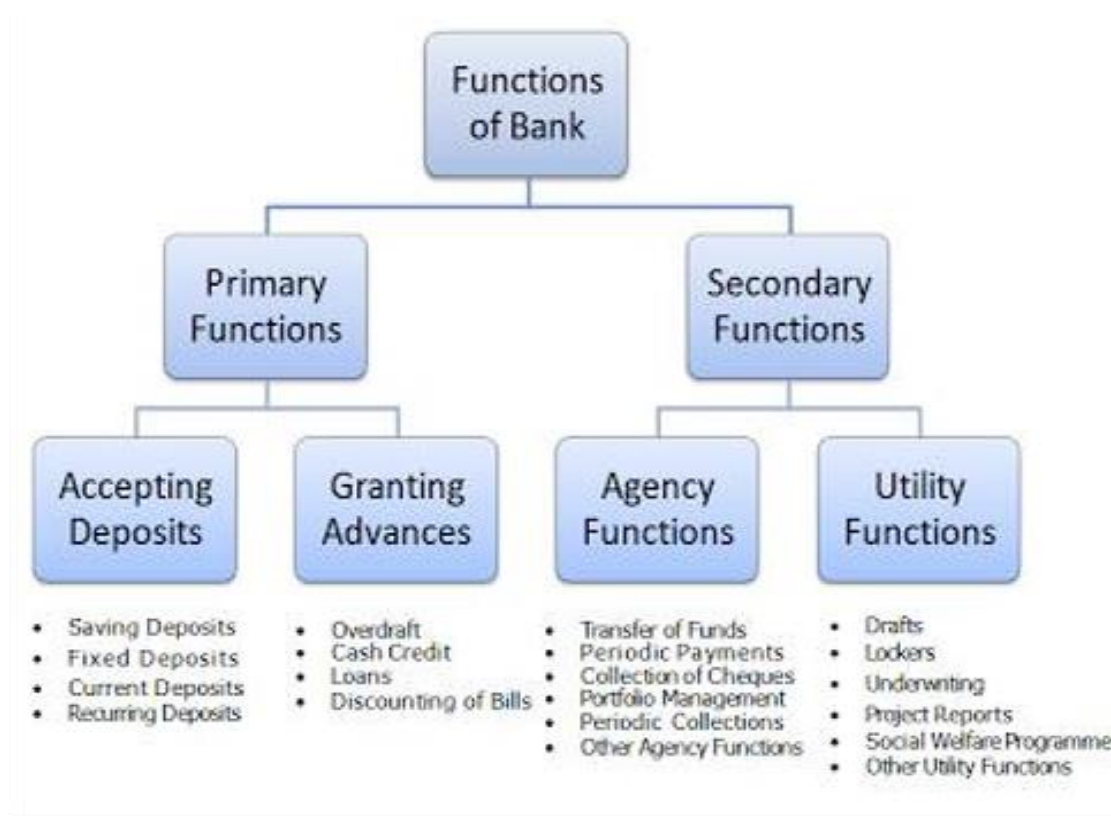
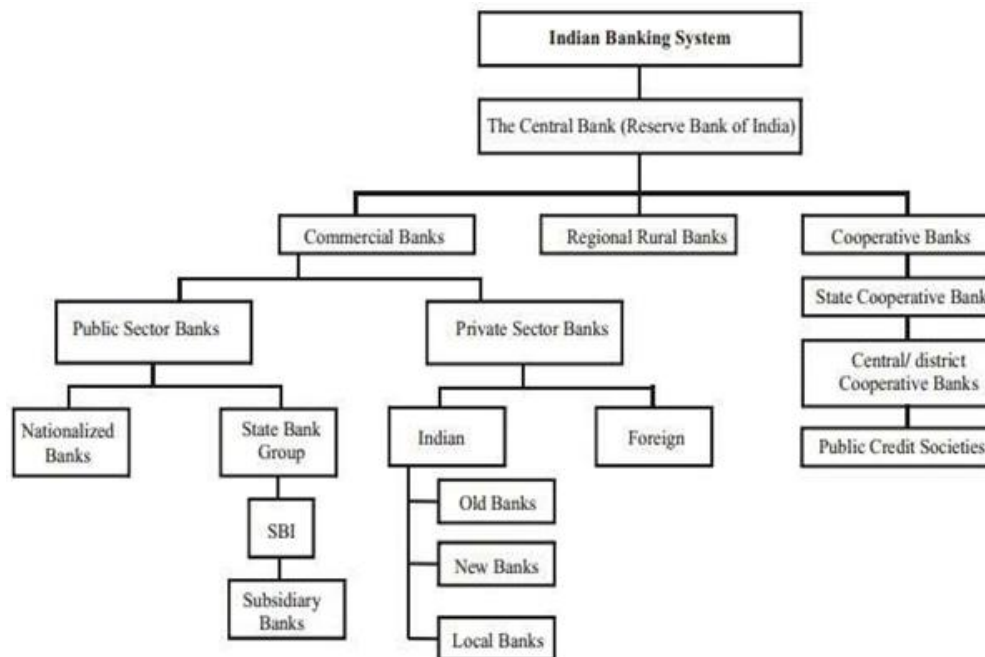
- To ensure the health of the investments made by the taxpayer.
- To promote consumer trust in the financial system such that investments are made easily and effectively.
- To prevent the growth of economy influenced by handful of the entities.
- Provide credit, tax income and other services to the State.
- To support segments of the financial system that have unique financing requirements, e.g. Housing, small enterprise, farm loans, etc.

Significance Of Banking Sector

Banking system has entirely transformed individuals' lives. The relation of banks and its clients had profoundly augmented. The reliance on banks is drastically increased may it be any aspect of financial transaction. This is possible as the banks also have made their processes simple and customer friendly. Due to different initiatives taken by Government, it has become possible for all strata of the society to access banking service and make their lives more comfortable in financial terms.

Due to advancement of the technology, it has become very convenient to make the banking transactions in few seconds.

Functions Of Public Sector Banks



Source- insightsonindia.com

Porter's 5 Model for Banking Sector-

A. Threat To New Participants:

Since any business deals with other investors' capital, and new entrants realize it hard to get going with financial

records. Thanks to the complexity of the sector, individuals are more likely to put their trust in the big name, well-known, global banks that

they find to be trustworthy. In the end, barriers to entry are fairly small for the banking industry.

B. Power Of Buyer: The banking industry's users' strength has grown tremendously as a result of technological advancements. Consumers' comfort and costs have been greatly improved as a result of technological advancements.

, mutual funds, and fixed income securities are just a few of the many banking services that non-banking organizations provide.

D. Competitive Rivalry:

As a result, banks must gather consumers away from other player banks. They accomplish this by offering less expensive capital, better rates, more investment resources, and greater flexibility than their contestants.

E. Power of Suppliers:

The strength of the sellers is mostly dependent on the market. Their strength is frequently believed to range between medium to high.

Pestle Analysis

1. Political Factors: Political regulation impacts the status of the financial industry. The government will intervene in banking matters at any moment, making the sector open to constitutional intervention. It involves collusion within political parties or particular regulations, such as labour rules, export controls, taxes and democratic peace.

2. Economic Factors: The banking industry and the financial system are linked with each other. How revenue flows, whether the economy is streams swiftly or hardly remaining during a recession, have an effect on how much investment banks can gain access to. Financial conditions, and the factors behind them, affect whether consumers

C. Availability Of Substitutes:

The majority of the most significant substitution challenges to the banking industry come from non-commercial actors rather than competitive banks.

In terms of deposits or withdrawals, the industry faces no serious risk of alternatives, but insurance

deposit or invest money in banks.

3. Socio Cultural Factors: Cultural factors like buying behaviors and prospects, impact how individuals view and support for credits appropriate for commercial, house and education. Customers are looking for expertise from bankers about savings accounts, plastic money, savings, and so on. Customers hope for a smooth banking experience. Growing technology is facilitating customers to purchase goods and availing services in easier manner, without needing support from banks.

4. Legal Factors: The banking business follows stringent regulations on the subject of confidentiality, customer regulations, and trade constructs to verify contexts within the business. These arrangements are necessary for consumers in the allotted nation and for worldwide clients.

5. Environmental Factors: Due to emergence of technology especially Mobile Banking, the use of paper is considerably diminished. In fact, the necessity to travel to a bank for doing transaction is also reduced. This prevents the use of document and results into better environment.

Literature Review

- Parveen & Sameera, 2016 has conducted analysis of Punjab national bank and State bank of India using ratio analysis. The author has said that public sector banks are financially sound and good in their performance. Whereas the other bank is attractive in their stock



valuation and good for investment. In addition, the author has urged investors to lay emphasis on the current market conditions and nonmonetary factors while taking their investment decisions.

- Jeevitha & Sravani, 2018 has conducted fundamental analysis for three public sector banks. The study was conducted with the objective to help in Investment decision making. The author has conducted three tier analysis i.e. economic, industry and company analysis for the selected public sector banks. The author has used various ratios for identifying the financial position of these banks.

- According to Sodhi and Waraich (2016), fundamental analysis investigates the many financial, economic, and industrial aspects that influence the risk-return of securities and aids in investing decision making.

- Undavia, 2016 has stated that the Indian banking system is unique in the world and has evolved a lot in the last five decades. Indian Banking system has a vast growth potential but also facing from some of the formidable challenges like increased level of competition and increase in the level of nonperforming assets. The author has used various financial factors like net profit margin, operating profit margin, earning per share and return on equity for analysing the selected banks. The author has concluded by suggesting South Indian Bank as the best stock from selected private sector banks and Punjab national bank as the best stock from public sector bank.

Research Methodology

The paper is based on equity research analysis research of two banks in public sector banks. Hence study has been done on the basis of secondary data i.e. news, magazines, research papers and so on. This investigation concluded with a fundamental analysis of the banks.

Secondary data was gathered from the websites of the selected companies, as well as yearly and quarterly reports for the current fiscal year, indicating their successes in the current market setting.

Daily stock market values were watched while preparing this project, and the yearly reports of the companies reviewed were taken into account for evaluating corporate performance.

Data Analysis

State Bank Of India

The State Bank of India (SBI) is a public sector bank and a statutory body for financial services. It is a statutory government organisation headquartered in Mumbai, Maharashtra. SBI is ranked 236th on the 2019 Fortune Global 500 list of the world's largest firms. It is India's largest and most powerful bank, with a 23 percent market share in assets and a one-fourth part of the total loan and deposit market. The bank descended from the Bank of Calcutta, which was created in 1806, through the Imperial Bank of India, making it the oldest commercial bank in the Indian subcontinent. The Bank of Madras merged with British India's other two "presidency banks," the Bank of Calcutta and the Bank of Bombay, to form the Imperial Bank of India, which ultimately became the State Bank of India in 1955. In 1955, the Government of India took over control of the Imperial Bank of India, with the RBI purchasing a 60% stake and renaming it the State Bank of India.

Punjab National Bank

The Punjab National Bank (PNB) is a government-owned banking and financial services institution located in New Delhi, India. The bank was founded in 1894 and is India's second largest public sector bank (PSB) in terms of both business and network.

Following the merger of United Bank of India and Oriental Bank of Commerce on April 1, 2020, the bank now has over 180 million customers, 10,910 branches, and 13,000 ATMs. PNB has a banking subsidiary in the United Kingdom (PNB

International Bank, with seven divisions in the United Kingdom), as well as divisions in Hong Kong, Kowloon, Dubai, and Kabul. It has demonstration offices in Almaty, Kazakhstan, Dubai, United Arab Emirates, Shanghai, China, Oslo, Norway, and Sydney, Australia (Australia). It controls 51 percent of Druk PNB Bank, which has five branches in Bhutan. PNB owns 20% of Nepal's Everest Bank Limited, which has 50 branches. Finally, PNB controls 41.64 percent of JSC (SB) PNB Bank in Kazakhstan, which is divided into four sections.

The decision of investment in equity is done on the basis of following two types of analyses-

1. FUNDAMENTAL ANALYSIS
2. **Technical Analysis**

Fundamental Analysis

Fundamental analysis considers several factors that influence stock prices, including sales, the price to earnings (P/E) ratio, profitability, earnings per share (EPS), the current ratio, and Company and industry specific features. Fundamental assessment contains:

1. Fiscal analysis
2. Sector analysis
3. Company analysis

The intrinsic value of the common stock is determined based on the studies indicated above. This is thought to be the stock's genuine value. If the intrinsic worth is more than the market price, it is advised that the share be purchased. If it is equal to the market price, keep the share; if it is less than the market price, sell the share.

Types Of Fundamental Analysis:

1. Qualitative Aspects
2. Quantitative Aspects

The numerous fundamental components can be classified as quantitative or qualitative.

1. **Qualitative** - related to the character or quality of something, as opposed to its size or quantity.
2. **Quantitative** - able to be measured or expressed numerically.

Qualitative Factor – The Sector

Each company's customer base, market share among firms, industry-wide growth, competition, regulation, and business cycles differ. Knowledge how the industry works will provide an investor with a better understanding of a company's financial health.

• Customers

Some businesses cater to a small number of clients, while others operate with a large number of people. In most circumstances, it is undesirable for a company to rely on a small number of customers for a substantial amount of its sales because each customer's loss can have a significant impact on revenues.

• Market share

Understanding a company's current market share can offer information about its revenue. In actuality, any company with a market share of more than 85% is regarded as the best performer in its industry. Furthermore, this can indicate that the company has some form of "economic moat," or a competitive barrier that serves to protect its current and future profitability, as well as its market share. Because of economies of scale, market share is vital. When a company is larger than its competitors, it is better able to bear the high fixed expenses of a capital-intensive industry.

Qualitative Factor – The Company

Before delving into a company's financial statements, consider some of its qualitative qualities. The following are the company's qualitative factors that investors should be aware of:

Business Model

One of the most important issues that should be addressed is, what exactly does

the firm do? This is referred to as a company's business model. Is this how a corporation makes money? By checking a company's website or annual report, you can obtain a solid idea of its business plan.

Past Performance

Another effective way to obtain a sense of a firm's expertise is to look at how managers have performed in other organisations in the past. On most company websites, you may find profiles of key executives. Distinguish the companies where they previously worked and conduct a search on those companies and their efficiency.

Qualitative Factor-The Economy

The banking industry represents a critical juncture in almost all financial activities. Interest rates, inflation, house sales, and general economic productivity and growth are among the most important data. Each bank's investment decision should involve an evaluation of the bank's fundamentals and financial health.

• Gross Domestic Product and Productivity

Because banking and financial intermediation involve a wide range of market transactions, banks tend to see more business while the economy is expanding. Investors can utilise gross domestic product (GDP) to determine current economic health and efficiency levels as an indicator of the banking sector's future economic health.

• Inflation

A growing inflation rate tends to raise the rates on credits. The cost of funds for banks increases. This take the lead to a growth in home loan interest rates, among other loan rates, and subsequently an increase in EMIs.

Quantitative Factors

Now that we've covered the qualitative aspects of fundamental assessment, let's move on to the quantitative aspects of fundamental analysis. Analysis of the

company's financial statements is one of the quantitative factors.

Ratio Analysis

Earnings per Share (EPS): It is used to understand the portion of total earnings per each share that is outstanding. This gives the Net profit received by each shareholder of the company. If EPS is higher, it means that profit per share is higher. It implies profitability of the company.

$$\text{EPS} = \frac{\text{NET INCOME} - \text{PREFERENCE DIVIDEND}}{\text{NO. OF EQUITY SHARES}}$$

NO. OF EQUITY SHARES

Return On Equity:

Return on Equity is calculated as the total of net income repaid as a percentage of shareholders' equity. Return on equity measures a company's profitability by demonstrating how much profit it generates with the money stockholders have invested. Return on net worth is another name for it.

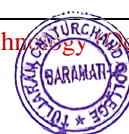
Return on equity is calculated as

$$\text{ROE} = \frac{\text{NET INCOME}}{\text{NET WORTH}}$$

PE RATIO: The PE ratio is determined by the market's perceptions of risk and anticipated profits growth. When compared to a corporation with a greater PE ratio, a company with a low PE ratio means that the market perceives it as having higher risk, weaker growth, or both. The PE ratio of a listed business's share is the outcome of the market's collective view of how hazardous the firm is and what its profits growth prospects are in comparison to other companies. If the investor believes that his perception is superior to the market's, he can decide whether to buy or sell.

$$\text{PE RATIO} = \frac{\text{MARKET PRICE PER SHARE}}{\text{EARNINGS PER SHARE}}$$

EARNINGS PER SHARE



Current Ratio:

It is an assessment of current assets in comparison with current liabilities, calculated by dividing your current assets by your current liabilities. Prospective investors use the current

ratio to measure a company's liquidity or ability to pay off short-term debts.

Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

CURRENT LIABILITIES

Long-term debt. The greater ratio reveals that assets have been primarily funded by proprietor's finances and the long-term credits are sufficiently protected by assets.

Total Assets to Debt Ratio:

This ratio assesses the magnitude of the exposure of long-term debts by assets. It is computed by dividing Total assets with

TOTAL ASSETS TO DEBT RATIO = $\frac{\text{TOTAL ASSETS}}{\text{TOTAL DEBTS}}$

□

COMPARISON SHEET

EPS	SBI	PNB			CURRENT RATIO	SBI	PNB
2017	0.31	5.78			2017	0.37	0.3
2018	-5.32	-54.71			2018	0.39	0.31
2019	2.58	-29.68			2019	0.33	0.33
2020	22.15	0.8					
EPS=NET INCOME - DIVIDEND/NO.OF EQUITY SHARES.				CURRENT RATIO=CURRENT ASSETS/CURRENT LIABILITIES			
ROE (%)	SBI	PNB			PE RATIO	SBI	PNB
2017	0.13	3.01			2017	947	51
2018	-2.21	-31.26			2018	-48	-4.57
2019	0.98	-22.82			2019	124	-10.81
2020	7.87	-0.68			2020	89	246
ROE=NET INCOME/NET WORTH			PE=MARKET PRICE PER SHARE/EARNINGS PER SHARE				

INTERPRETATION

- EPS of PNB Bank has smallest ratio in all years and it slightly decreased in 2018. SBI have parallel levels and it has highest ratio in 2017.
- PE ratio of SBI is highest in 2017 i.e 947 while PNB has its highest in year 2020 i.e 246.
- Current ratio has a minor difference for SBI Bank and in case of PNB it is in increasing trend from 2018
- ROE of SBI is better than PNB as PNB shows higher ROE in the year 2017 i.e 3.01 and later it is in a decreasing trend.



BALANCESHEET (STATE BANK OF INDIA) (Cr)

Particulars	March 2016	March 2017	March 2018	March 2019	March 2020
EQUITY & LIABILITY					
Share Capital	776.28	797.35	892.46	892.46	892.46
Total Reserves	1,43,498.16	1,87,488.71	2,18,236.10	2,20,021.36	2,31,114.97
Deposits	17,30,722.44	20,44,751.39	27,06,343.29	29,11,386.01	32,41,620.73
Borrowings	3,23,344.59	3,17,693.66	3,62,142.07	4,03,017.12	3,14,655.65
Other Liabilities	1,59,276.08	1,55,235.19	1,67,138.08	1,45,597.30	1,63,110.10
Total Liabilities	23,57,617.54	27,05,966.30	34,54,752	36,80,914.25	39,51,393.92
ASSETS					
Balance with RBI	1,29,629.33	1,27,997.62	1,50,397.18	1,76,932.42	1,66,735.78
Balance with Banks	37,838.33	43,974.03	41,501.46	45,557.69	84,361.23
Investments	5,75,651.78	7,65,989.63	10,60,986.72	9,67,021.95	10,46,954.52
Advances	14,63,700.42	15,71,078.38	19,34,880.19	21,85,876.92	23,25,289.56

Particulars	March 2016	March 2017	March 2018	March 2019	March 2020
Net Block	9,89,201.65	42,20,179.99	39,20,871.1	38,20,194.4	38,023.39
Interest Earned	1,63,998.30	1,75,518.24	2,20,499.32	2,42,868.65	2,57,323.59
Other Income	27,845.37	35,460.93	44,600.69	36,774.89	45,221.48
Other Assets	1,40,408.41	1,54,007.72	2,26,994.20	2,66,327.70	2,89,613.55
Interest Expended	1,06,803.49	1,13,658.50	1,45,645.60	1,54,519.78	1,59,238.77
Operating Expenses	23,57,617.54	27,05,966.30	34,54,752	36,80,914.25	39,51,393.92
Total Provisions	29,483.75	35,992.72	75,039.20	53,128.55	43,330.37
Profit Before Tax	13,774.05	14,855.17	-15,528.24	2,307.48	24,802.24
Taxes	3,823.40	4,371.07	-8,980.79	1,445.25	10,314.13
Net Profit	9,950.65	10,484.10	-6,547.45	862.23	14,488.11



Adjusted EPS (Rs.)	12.82	13.15	-7.34	0.97	16.23
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Profit & Loss Account-

Observations-

- In case of loans, the bank informed 6.38 %. If you see 3 years advance growth, it stands at 13.96 %.
- High Cost to income ratio of 52.46%.
- The bank has a very low ROA track record. Average ROA of 3 years is 0.06%
- Share capital does not show a major change from 2016-2020
- Operating expenses is increasing gradually.

Balance sheet (Punjab National Bank) (cr)

PARTICULARS	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20
Equity & Liabilities					
Share Capital	392.72	425.59	552.11	920.81	1,347.51
Total Reserves	37,917.42	41,671.87	40,522.19	43,866.32	61,009.97
Deposits	553051.13	6,21,704.02	6,42,226.19	6,76,030.14	7,03,846.32
Borrowings	59,755.24	40,763.34	60,850.75	39,325.92	50,225.43
Other Liabilities	16,273.94	15,765.73	21,678.86	14,806.29	14,236.68
Total Liabilities	667390.46	7,20,330.55	7,65,830.10	7,74,949.46	8,30,665.91
Assets					
Balance with RBI	26,479.07	25,210	28,789.03	32,129.13	38,397.85
Balance with Banks	49,144.02	63,121.65	66,672.97	43,158.91	37,595.18
Investments	157845.89	1,86,725.44	2,00,305.98	2,02,128.22	2,40,465.64
Advances	412325.80	4,19,493.15	4,33,734.72	4,58,249.20	4,71,827.72
Net Block	5,222.73	6,273.25	6,349.33	6,224.85	7,239.07
Other Assets	16,372.94	19,507.06	29,978.07	33,059.15	35,140.45
Total Assets	667390.46	7,20,330.55	7,65,830.10	7,74,949.46	8,30,665.91

Profit And Loss Statement (PNB) (Cr)

PARTICULARS	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20
Interest Earned	47,424.35	47,275.99	47,995.77	51,310.25	53,800.03
Other Income	6,000.05	8,951.37	8,880.87	7,377.41	9,274.13



Interest Expended	32,112.57	32,282.82	33,073.36	34,153.94	36,362.24
Operating Expenses	9,972.45	9,379.38	13,509.07	11,538.48	11,973.37
Total Provisions	17,077.26	12,553.62	29,869.28	28,341.01	13,999.56
Profit Before Tax	-5,737.89	2,011.54	-19,575.08	-15,345.77	738.98
Taxes	-1,763.49	686.74	-7,292.26	-5,370.28	402.79
Net Profit	-3,974.40	1,324.80	-12,282.82	-9,975.49	336.19
Adjusted EPS (Rs.)	-20.24	6.23	-44.49	-21.67	0.5

Observations

- Company has a low ROE of -19.05% over the last 3 years.
- The firm has produced weak profit growing of -36.69% over the past 3 years.
- Other income of the company is increasing in an increasing trend
- Interest earned is stable from 2016-2020.
- Share capital is showing a positive change from 2016-2020. Recently it is 1,347.51.cr

Findings And Suggestions

- With a population of more than a 1.3 billion people, India represents a massive market for Banking sector to invest, with very positive growth in the future
- Stagnation has a major negative impact on this sector
- Financial environments is highly dependable on banking sector
- PNB is trying hard to cross the position of SBI
- SBI shows more Market Capitalization as compared to PNB.
- Through fundamental analysis it has been observed that these 2 Banks are presently showing a descending trend in the market
- Share capital of PNB is highest in 2020 which shows the future growth of the bank.

- The study advises the investor to use knowledge about the qualitative factors and current market situations while taking Investment decisions.
- The shareholders should know the past performance of the firms prior to investing in the shares of those companies.
- Investors should understand the limitations used in Fundamental analysis

Conclusion

From the analysis, it can be decided that Public sector banking is flourishing after recession and there will be a decent progress in next few years. India has become a Good destination for investors to Invest.

The financial development of the nation is an appropriate sign for the development of the banking sector. The Indian financial system is expected to flourish and the country's banking sector is projected to replicate this growth. These days, banks in India are turning their focus to servicing clients and improving their technology infrastructure, which can help better customer experience and give them a competitive edge. Since Indian economy is observing robust development, the requirement for banking services.

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STATISTICAL MODEL FOR GENDER INEQUALITY

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ABSTRACT

Gender disparity stymies a country's development efforts around the world, particularly in developing countries. Gender equality means that men and women are both free to develop their strengths and make their own decisions. Gender inequality research is critical for society to improve its attitudes toward women. To test the effects of social issues on gender inequality, we used logistic regression to model. Using stepwise regression, we pick a collection of key issues. We were able to properly verify the model's sufficiency. We conclude that gender equality is unaffected by location, social class, or appreciation of women's role in religious activities. Age, nature of marriage, religious belief, dowry concerns, and equal voice in decision-making largely effects on gender inequality, according to the logistic regression. These factors can help you modify your social situation.

Keywords: Gender equality, Logistic regression, Stepwise regression, Naïve-Bayes' classification, Decision tree.

Introduction

In our country, from the ancient culture women is worshipped as a goddess. Women play important role in our society in every era. Afterward, traditional patriarchal customs and norms have relegated women to a secondary status within the household and workplace.

In the world, women face gender discrimination everywhere. But less gender equality creates problems for women as well as society. Women must have equal rights as men in the family as well as in society. The effect of gender discrimination on the different sectors and also social growth of any nation is the motivation of the study. In this paper, we are interested to find out the reasons behind gender inequality.

Gender equality refers to equitable treatment of men and women based on their individual needs. Gender inequality impacts on:

- Women's health over their lifetime.
- Women's educational attainment and economic conditions
- Women's Political empowerment

Although the constitution of India grants men and women equal rights, gender inequalities remain. Different inequalities occurred in various areas like Economic Inequalities, Educational Inequalities, Political Inequalities, Religious Participation, etc.

Literature Review

This research study looked into the reasons that contributed to gender disparity in Kyebi, Ashanti Region of Ghana.

Mavis Dako-Gyeke and Prince Owusu (2013) explored factors that perpetuated gender inequality in Kyebi, in the Ashanti Region of Ghana. Four causes were discovered to be at the root of gender inequality in the Kyebi community. These were cultural and traditional practices, gender socialization, poverty and discrimination in access to land.

The impact of relative socioeconomic position and perceptions of gender inequality in the marital relationship, in combination with domestic labour, on psychological discomfort was explored by L. Harryson et. al. (2012) using logistic regression analysis.

Sumanjeet S. (2016) explores numerous mechanisms that help countries close gender gaps as they grow. Why has the sex ratio gotten increasingly male-skewed with development, according to the author of the study? In addition, the author outlines several legislative options for addressing gender inequality.

Objectives

- To find out the causes of gender inequality in the Baramati Region.
- To study which factors most impact gender inequality.



- Develop a statistical model for gender inequality.

Methodology

In the Baramati region, the study depicts gender inequality in rural and urban areas. As a result, we chose four places for pilot research, two of which are rural regions and the other two are urban areas.

Malegaon and Jalgaon Supe are two villages in the rural area. Rui-paati and Kasba are both located in the urban area. Then, for a pilot study, we create a questionnaire. We take a sample of 25 women from each area for the pilot study and analyse the data to develop the questionnaire.

We chose 40 questions for the final study, and the response question is "Is there gender equality in your house or your village?". These 40 questions are the 40 variables, and these variables are coded as Q1 to Q40. Out of which Q40 is the response variable. The primary data were collected with the approval of the Baramati municipality and the village Sarpanch from 371 women.

Our response is dichotomous, which means it has only two options: "Yes" or "No," therefore we used Logistic Regression to determine which factors are important in determining gender inequality.

Logistic Regression (LR):

Linear regression is typically employed when the response or dependent variable occurs on a continuous basis and the residual errors are normally distributed. We perform logistic regression when the dependent or response variable is not continuous. This regression shows a categorical or dichotomous variable regression model. The association between several independent variables and categorical dependent variables is investigated using logistic regression, often known as the logistic or logit model.

For example, Y can represent values such as "success" or "failure," "Yes" or "No," "Like" or "Dislike," all of which can be represented by the numbers 0 and 1.

The logistic regression model is:

$$\ln\left(\frac{p}{1-p}\right) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k$$

Where p is the probability of desirable outcome, X_1, X_2, \dots, X_k is independent variable, α is intercept and $\beta_1, \beta_2, \dots, \beta_k$ are regression coefficients.

The assumptions of Logistic regression as follows:

Errors are independent but not normally distributed.

Binary logistic regression is used if dependent or response variable is in binary in nature.

It can hold non-linear relationships between all variables, including independent and dependent variables, and it can also convert non-linear logs to LR.

In comparison to linear regression, this regression requires a large sample size because maximum likelihood approximations have low power for small samples.

Stepwise Regression:

The forward and backward selection approaches are combined in Stepwise Regression. Stepwise Regression is a kind of modification of forward selection in which all regressors previously entered into the model are appraised using their partial F (or t) statistics at each step. Because of the relationships between it and other regressors in the equation, a regressor introduced earlier in the process may be redundant. If a variable's partial F (or t) statistic is less than F OUT (t OUT), it is removed from the model.

Stepwise regression requires the use of two cutoff values: one for entering variables and the other for deleting them. Some analysis prefers to choose F IN (or t IN) = F OUT (t OUT), although this is not necessary. Frequently we choose F IN (or t IN) > F OUT (t OUT), making it relatively more difficult to add a regressor than to delete one.

Confusion Matrix

A confusion matrix is a table that shows how well a classification model (or "classifier") performs on a set of test data for which the true values are known. It is useful to calculate Sensitivity and Specificity.



True Positives (TP): These are cases in which we predicted YES (they have the disease), and they do have the disease. Sensitivity can be calculated by formula as,

$$\text{Sensitivity} = \text{TP}/\text{actual yes}$$

True Negatives (TN): We classify NO, and they don't have the disease.

Specificity can be calculated by formula as $\text{Specificity} = \text{TN}/\text{actual no}$

False Positives (FP): We classify YES, but they don't actually have the disease. (Also known as a "Type I error.")

False Negatives (FN): We classify NO, but they actually do have the disease. (Also known as a "Type II error.")

Statistical Analysis

Logistic Regression

This is suitable regression analysis used where response variable is occurs binary in nature. We apply this on our data.

Initial Model: $\text{fit1} = \text{glm}(\text{Q40} \sim ., \text{family} = \text{binomial}(\text{link} = \text{"logit"}), \text{data} = \text{d1})$

Table 1: Table for Coefficients of initial Logistic Regression model

(Intercept)	Q1	Q2	Q3	Q4	Q5	Q6	Q7
14.618378	0.008588	0.264677	-0.121454	-0.721143	0.117977	0.018066	-0.012936
Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
-0.051111	0.082232	-0.179252	0.745625	-0.091411	-0.10271	-0.015852	-0.141884
Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23
0.725171	0.247032	0.564258	-0.145317	0.01547	-0.207072	0.460606	-2.212649
Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31
-0.086223	-14.07962	1.286363	-0.924711	0.05523	-0.484673	0.72801	1.121051
Q32	Q33	Q34	Q35	Q36	Q37	Q38	Q39
0.399346	-0.610032	0.537779	-0.016188	1.108892	0.387874	-0.133588	-0.139423

Residual Deviance: 336.8 AIC: 416.8

From the analysis of deviance, we observe that the Q11(Do you think that both men and women should share household works equally?), Q23(What is your opinion about dowry system?), Q26(Do you agree that both boys and girls are getting quality education equally from school?), Q36(Would women in decision making improve delivery of basic services?) are significantly affected on the response factor "Is there gender equality in your house or in your village?"

Adequacy of the fitted model: p-value = 0.02488.

So, from the adequacy of the fitted model we observe that the p-value = 0.02488, is less than the level of significance(α). Hence, for getting better adequacy we use stepwise regression technique.

Stepwise Regression:

Final model of stepwise regression:

$$\text{Q40} \sim \text{Q2} + \text{Q4} + \text{Q11} + \text{Q18} + \text{Q21} + \text{Q23} + \text{Q26} + \text{Q29} + \text{Q30} + \text{Q31} + \text{Q34} + \text{Q36}$$

Table 2 : Table for Coefficients of Final model of stepwise regression.

(Intercept)	Q2	Q4	Q11	Q18	Q21	Q26
0.05615	0.26938	-0.77296	0.81079	0.65894	-0.29246	1.24195
Q29	Q30	Q31	Q34	Q36	Q23	
-0.48863	0.66106	0.96636	0.56877	1.21725	-2.0661	

Null Deviance: 413.4

Residual Deviance: 347 AIC: 373



Results and Discussion

The AIC of initial model is 416.8, but the AIC of final model of stepwise regression is 373. It shows that final model given by stepwise regression is better. The difference between the null and residual deviances indicates how well our model performs in comparison to the null model (a model with only the intercept). The wider this gap, the better.

Confusion Matrix

Response	FALSE	TRUE
0 (NO)	30	61
1 (YES)	12	268

True Positive Rate:

$$TP / (\text{actual yes}) = (268/280) = 0.9571$$

It is also known as "Sensitivity" = 95%.

True Negative Rate:

$$TN / (\text{actual no}) = (30/91) = 0.3296$$

It is also known as "Specificity" \approx 33%

Adequacy of the Final model:

X-squared = 5.4227, df = 8, p-value = 0.7116
Hence, from the p-value = 0.7116 we can say that model is adequate.

Accuracy of the final model is 0.8032345 i.e. 80.32%. It means stepwise logistic regression, is very much useful for identifying the variates, that relates to gender inequality.

Conclusion

Gender inequality is still a reality in the Baramati region, if not the entire world. This situation will change soon if society's perspective on domestic chores, religious belief, dowry system, quality education, and the position of the decision maker in the home and society changes. In the Baramati region, it is hoped that by expanding education and opportunity for women, gender disparity would be eradicated.

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A STUDY OF PERSONAL FINANCIAL PLANNING OF HOUSEHOLDS WITH SPECIAL REFERENCE TO BARAMATI IN PUNE DISTRICT OF MAHARASHTRA STATE

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ABSTRACT

The financial planning as well as financial product awareness among the rural people is the need of the Indian Society. The people feeling the importance of budgeting, record keeping balance for households. However, they are unable to practice this thing because of lack of awareness and lack of guidance. The financial products like Pension and Insurance having great importance in the minds of Indian citizens, but majority of them are unable to get such a product due to lack ease of access and availability. Analysis of data also depicts less preference towards the institutional borrowing due to unavailability of credit to many people. Hence, unfortunately, they have to go for private money lenders. The researcher has identified this research problem, designed descriptive research for this. Collected primary data through online questionnaire. Secondary data from various publishers and website is used for this study. The hypothesis tested using Z test. The results are presented in the form of graphs. In the concluding part solutions are provided to overcome the problem of rural households.

Keywords: Financial Plan, Rural Households, Investment, borrowings, risk, insurance, etc.

Introduction

Even though a personal finance is one of the most significant factors in our lives, we are spending least time on managing them. We are not answerable for personal financial goals and results. When we plan personal finance properly, we can contribute larger time to every area of life.

Financial Planning- It is a step by step process to ensure that we plan and invest in a way so that we are constantly in sight of our goals and the effort that is required to achieve them.

Rural Financial Cooperatives- In rural India, the cooperative credit system is mostly adopted by rural families. It is bringing together individual farmers and their production capacity through cooperatives.

Objectives:

Thinking about the own life, you'll be aware that the financial goals, and the ways you go about trying to achieve them, can be influenced by social factors such as the values, culture or religion as well as by economic factors. In terms of religious values, for example, the taking or paying of interest is prohibited under sharia law, as it was by the Roman Catholic Church in earlier centuries. Approaches to charitable donations, the giving of care and financial support to family members are also affected by contextual social factors.

Methods

Even though a personal finance is one of the most significant factors in our lives, we are spending least time on managing them. We are not answerable for personal financial goals and results. When we plan personal finance properly, we can contribute larger time to every area of life.

Research Problem- Origin of Research The researcher finds that, the there is need of financial planning in the life of each and every citizen. There is much awareness among the urban people about the financial planning, but in case of rural!!! It is worst condition among the rural citizens of India. This is the attempt to know, analyse and spread of awareness of financial planning among the rural Family.

Objectives of the Study-This study the financial planning of rural Family, the researcher sets following objectives as:

1. To study the awareness of financial planning among the rural Family
2. To study the availability of financial planning avenues to the rural Family
3. Hypothesis- To conduct research on the financial planning of rural Family, the researcher sets following Hypothesis for to be tested:

1. Null Hypothesis H0: There is financial literacy among the rural Family
2. Alternative Hypothesis H1: There is not financial literacy among the rural Family



Scope of the study

1. Geographical Scope: Baramati Territory (Maharashtra- India) has selected for the data collection
2. Time Horizon: Data is collected During the Financial Year 2017-18, 2018-19 and 2019-20
3. Content scope: this project is limited to the financial data of the family

Significance of the study in the context of current status

The research has very much scope in the rural financing. The financial institutions and banks are asking to generate need of financial planning among the rural Family. This study will be benefited for following:

1. To all rural Family in their personal financial planning
2. To all Banking institutions in the customizing the financial products for rural Family
3. To all Non-banking and banking institutions to design plans for rural market
4. To government for drafting new policy for rural Family

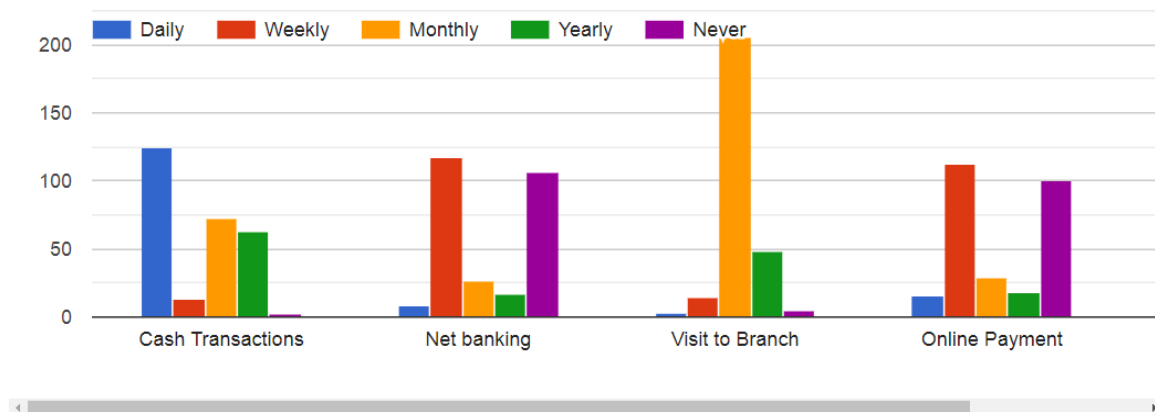
5. To NGO’s related to micro financing the rural market of India

Research Design

1. Data Required: To suffice said objectives and testing of hypotheses following data is collected. Primary Data- The Survey is collected with preparing schedule via online google form and collected through research buddies on convenient sampling that is non-probability sampling method is used. Secondary Data- The secondary data various published books on financial planning, personal finance, etc.
2. Sources of Data: Both Primary and Secondary sources of data are utilized for this study. Secondary sources: To gather the information secondary sources viz. Books, Journals, Magazines and Periodicals are used. Primary Source: To collect the information of primary source of data collection using a questionnaire is used.
3. Instruments/ Research tools- For data collection structured questionnaire is used and collected data with direct visit to the respondents.

Result

Use of Banking Services



Source: Primary data collected

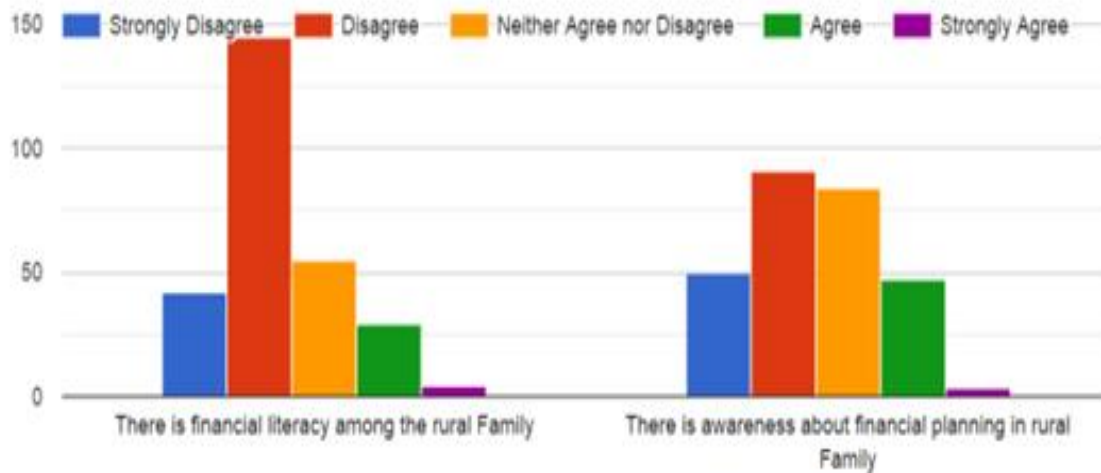
Interpretation

From the above graphical representations researcher made interpretation regarding the frequency of use of banking services is that, majority of them are dealing with cash

transactions on daily basis. Rural people are using weekly net banking used by majority people. Monthly visit to the branch but they visit ATM on daily basis because of cash transactions. Weekly online payments are also in use.



Awareness Analysis



Source: Primary data collected

Interpretation

From the above graphical representations researcher made interpretation regarding the hypothesis statements, that the statement is at disagree side. The hypothesis testing has shown the acceptance of alternative hypothesis statements.

Testing of Hypothesis

The statement Examined was, “There is financial literacy among the rural Family”. For this statement, respondents were asked to give their view on a Five-point scale, from 5 meaning strongly agree to 1 meaning strongly disagree. Responses to this question, along with the means and standard deviations, are given in table. While the data were obtained using an ordinal Five-point scale, in calculating mean and standard deviation, the researcher was treating this statement as if they were measured at an interval level.

For this variable, test whether the mean response is on agree side of a neutral response, that is, test whether the mean exceeds 3. Use the 0.05 level of significance. Assume this sample is a random sample of all respondents.

Table: Responses to the statement

Response criteria	Responses
5 - Strongly Agree	4
4 - Somewhat Agree	29

3 – Neutral	55
2 - Somewhat Disagree	145
1 - Strongly Disagree	42
Total (n)	275
Mean (Weighted average) (\bar{x})	2.3018
Standard Deviation (s)	1.12

In order to determine whether the sample mean \bar{x} is within the critical region or not, it is necessary to determine the distance \bar{x} is from the hypothesized mean μ . This can be determined by obtaining the Z-value associated with the sample mean - that is, how many standard deviations \bar{x} is from the hypothesized mean of $\mu = 3$.

Calculations for Overall respondents

That is, the z value is 10.34 which is above the hypothesized z value. This is above the critical cut-off point of +2.33, so this Z-value is in the critical region for the test. That is, the sample mean is 10.34 standard deviations above the hypothesized mean of 3, a great distance, and one that is extreme enough to be in the right 0.05 of the distribution.

Since this Z-value is in the critical region, the conclusion of the test is to reject the null hypothesis H0 and accept the alternative hypothesis H1.

The conclusion is that the opinion of overall respondents is on the disagree side of neutral, a conclusion made at $\alpha = 0.05$ level of significance. This provides quite strong



evidence that overall Respondents on average are not neutral on this issue but tend to Disagree.

Interpretation

From the above analysis researcher made conclusion that, there is not financial literacy among the rural Family.

The researcher has set up the hypothesis to study the statement. As per the calculations of testing of hypothesis, the researcher accepts the alternative hypothesis i.e. there is not financial literacy among the rural Family.

Findings of the Study:

Findings are based on the Primary data as follows:

1. The data collected from the rural region only. As research focused on the rural part of India, the rural respondent's data has considered by filtering in Excel sheet.
2. The Number of Family members in the rural family is around 5 members on an average.
3. The Chief wedge earner in the rural family is having male dominating families.
4. The occupation of Chief of Family in the rural is either employed or self-employed in the similar proportion.
5. Annual Income Family in the rural is earning below 250000 per annum on an average.
6. Type of House of in the rural Family is having Pucca house on an average.
7. House Ownership of in the rural Family is having their own house.

Discussion and finding

Central to the situation is the goal of a comfortable retirement. The need is to have enough income throughout retirement to finance a certain standard of living. The

amount required will be determined largely by expectations of spending in retirement. This raises a question: whose spending needs? Should the financial plan look at the individual or the household? The danger of basing the plan on the household is that many households change over time as, for example, couples split up, family members and friends decide to share a home or leave, or people die. Traditionally, married couples have adopted the household approach, and the resulting financial plans have often proved inadequate in the face of death or divorce. This is a key reason why women account for such a high proportion of the poorest pensioners today. The advantage of a retirement plan based on the individual is that each member of the household has their own pension arrangements, which they retain even if the make-up of their household changes.

Result

As per the analysis of data, interpretations, and the findings, The Researcher has reached to the conclusion that, the alternative hypothesis is accepted. The financial planning as well as financial product awareness among the people is not in the India Society. The people feeling the importance of budgeting, record keeping balance for households. However, they are unable to practice this thing because of lack of awareness and lack of guidance. The financial products like Pension and Insurance having great importance in the minds of Indian citizens, but majority of them are unable to get such a product due to lack ease of access and availability. Analysis of data also depicts less preference towards the institutional borrowing due to unavailability of credit to many people. Hence, unfortunately, they have to go for private money lenders.

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TECHNOLOGY LITERACY - THE MANTRA OF SURVIVAL OF MANKIND**Prabha Kumari¹, M. K. Singh²**¹Dr. D.Y. Patil Arts, Commerce and Science College, Pimpri, Pune.²Vinoba Bhave University, Hazaribagh, Jharkhand.¹prabha.kumari@dypvp.edu.in**ABSTRACT**

Technology innovations are rampant in our times. The pace of changes in the technology domain is astonishing. To keep up with this swiftness, there is a demand on the humans to acquire the digital skills. These skills are required in our day to day living. We require these digital skills to earn a living for ourselves. The work discusses some of the scenarios highlighting the need for digital literacy. Some cases are discussed where the hindrances to technology literacy are discussed and the methods adopted to overcome them. The digital literacy is discussed at the backdrop of the technology acceptance model in this paper. The technology acceptance model comes handy in terms of digital literacy. The relevance of the model is significant when chalking out the demands of technology education. The technology literacy here is referring to the knowhow of digital system to use them to their potential. The paper tries to uncover some prevailing aspects of digital literacy in contemporary times.

Keywords: Digital Literacy, Technology, Digitalization, Technology Acceptance Model.

Introduction

This is no secret that we could do away with technology in the 21st century. We need to be with the times no matter what the age is. This is the mantra to survive in the world. As technology comes in our lives in one form or the other, being technology literate is not a privilege anymore, but a necessity. The machines are made for us (Legris et al, 2003). We need to be equipped with the knowledge to dictate them. We need to be educated enough to make use of the digital machines to improve our standard of living. These machines are ways to upgrade our lives (Robey, 1979).

New technologies of course would take time to be absorbed by the mankind (Subramanian, 1994). The acceptance of the technologies is dependent on the human attitudes and perceptions towards the technologies along with the relevance of the technologies to the environment (Tornatzky & Klein, 1982). The affordability of the technologies also is an important aspect along with the ease of its use. These things form one side of the coin. The other side of the coin represents the ability of the humans to handle the technology systems (Fishbein & Ajzen, 1977). This is the point where the technology literacy could help command the digital systems.

The business and job opportunities heavily rely on technologies. Technology literacy is not the domain of engineers and technicians only anymore. It is true that these people deal

with the digital systems in detail, but the common people need to know the knowhow of the technologies. Our country after demonetization has encouraged using online financial transactions. To make this work, one should be acquainted with these digital systems to thrive in the society. These are the needs of the time.

The education system itself has adopted digital medium to its core. The young generation by default has absorbed the digital systems in their lives. It is the older generations who need to adjust to the digital transformations. This adjustment is not a compromise but an investment to be future ready.

Digitalization and our lives

The acceptance of technology depends on number of factors. Digital literacy plays an important role in bridging the gap of technology acceptance. We have witnessed number of technology inventions used to build devices and not been widely accepted (Ajzen, 1987). While some technology inventions are readily accepted and have wide acceptance in the society (Yang & Yoo, 2004).

The kiosks or the vending machines are widely in use in the advanced countries. These systems are now in use in our country as well. The beverage vending machines now are a common sight at public places and offices. The Automated teller machines too are digital systems which are not a novelty now. These



now common systems were a novelty some time ago. What makes these innovations popular or common? What makes some technologies more popular than other? The answer to these questions could be found in the theory of Technology Acceptance Model.

Case Study

In the context of COVID-19, a popular fast-food chain installed digital kiosks to order food in their restaurant. This was to reduce the human interaction. The digital systems allowed the customers to browse the menu on the screen and place orders. The bill payment was also routed through the digital systems to make the entire food ordering process without any intervention of the restaurant employees. This system was observed in one of their restaurants. Three such touch screen devices were installed at the restaurant. Along with these digital systems, the routine manual order accepting counter was kept open too. The customers were observed for their responses towards these installed systems silently in the restaurant.

The customers initially were completely unaware of such systems and their utility as well. The manual counter was partially manned. The employee at the manual counter was urging the customers to use the newly installed food ordering systems. The customers when introduced with the new system found the restaurant menu on the big touch screen. The customers had to select the food items and put it into the digital cart. On finalizing the order, the customer had to check out and go for paying the bill. The bill payment system was similar to the digital payment systems used in the online shopping systems. Card swiping or tapping machines were kept too to accept the payments. The overall system was similar to the food ordering process available on the food delivery applications.

While observing the attitudes of the customers towards this new system of ordering the food, a large number of customers had inhibitions to order through these systems. These customers turned to the manual order taking counters for ordering the food. The customers who were reluctant to use the new systems were majorly middle aged. On the contrary, the youth were excited to use the new food ordering systems.

The behaviors of the customers were only observed with no probing about why the customers did or did not prefer the new ordering digital systems.

The customers who were reluctant to use the digital system were overheard complaining about the systems requiring human touch to the screens which are used by number of customers raising hygiene concerns. This was a deterrent for most of the customers to use the new technology. Though hygiene measures were carried out by placing sanitizer bottles at the kiosks, the idea to use hands on the screens to place orders and then having their food did not go down well among the customers. The purpose of the systems was to decrease human intervention, but it proved the other way.

The other observation was during the rush hours, the customers using the digital systems had the waiting queue on back of their minds. There seemed a pressure on the customers to place the orders within time so as to give the waiting customers their turn. A long time to handle the system and place the order meant the customer was unable to use the system. This was a kind of embarrassing situation for the customers. The need to be digitally competent at least in front of the customers in the vicinity could be seen through the customers' expressions. This led many customers to stay away from the systems and go to the manual ordering process.

In the above scenario, it was evident that the customers lacked the knowledge to use the systems. There was no initiation from the restaurant brand to educate their customers about such system in place and its way of handling. After considering the above observation, the management decided to deploy their employees at the kiosks to guide the customers through the ordering process. As there were three kiosks, three employees need to be employed. These three numbers of employees were greater than one employee which manned the manual counter. However, the ordering process proved to be faster, serving more customers than usual during the rush hours. The customers seemed comfortable knowing they had guidance to use the digital system. The fear of touching the screens also was eliminated as the employees



handled the screens taking recommended precautions.

This investment in educating the customers in terms of employees and time was required to ease the employees through the digital systems. It is not the case that the systems were too complex to operate, and it resembled the process of online shopping. Yet the novelty of the systems was a hindrance in putting the systems to use to their full potential. The communication by the brands about the technology systems put up at their place needs to be done before hand to make the stakeholders comfortable. The knowledge about these digital systems would make the stakeholders aware of the benefits of the systems.

Theory - Technology Acceptance Model

The technology acceptance model explains about the acceptance of technology by user using two prominent factors – Perceived Usefulness (PU) and Perceived ease of use (PEOU) (Davis, 1989).

Perceived Usefulness (PU) – It is the extent to which a subject believes a technology would enhance the job performance.

Perceived ease of use (PEOU) – It is the extent to which a subject believes a technology requires minimum efforts to use.

The digital literacy should include the above factors to make it effective. When imparting digital education, one has to be vigilant about the above two factors (Venkatesh, 2000). The model explains the significance about the preconceived notions of the users about the technologies and their utilities. These are a sort of hindrances in absorbing technology by people. The communication of the innovations and technologies is needed to be done in an effective manner to create an environment about the new systems.

Generation GAP

The youth seems to be more comfortable with the technology innovations. The older generation though competent in the skill department there seems to be inhibitions while using the technologies. This is evident through our day-to-day experiences. The middle aged and older people need lots of guidance to use the digital devices. Even after continuous

guidance the ease of use found is not at par with that of the younger generation. There are exceptions to this, but this seems the general pattern. The times when the Automated Teller Machines were introduced, there seemed reluctance in the usage due to novels and lack of knowledge to use the systems. Even today, due to digital illiteracy, many people stay away from using the ATM's and prefer manual banking operations (Davis et al, 1992).

There is a need for the technology giants to make people digital literate to expand their customer base. The digital illiteracy is a major block to generating revenues for this technology-driven companies. The social media giant Facebook has been recently advertising their offerings targeting the older generations. Same goes with the messaging application 'WhatsApp'. No doubt, these platforms are super popular with the young masses. However, the neglected chunk of older generation could generate revenues for these companies by making them digital literate. The commercials could be seen conveying the ease of use and the benefits to the x and y generations.

The older generations are vulnerable to digital hacks owing to their limited knowledge of the digital devices. This aspect needs to be taken care when involving the older generations into the digital arena. What is to be done and what should not be communicated when imparting digital education. Careful handling of the technologies is required rather than only making people aware about the utilities of the system. The digital literacy is a way to bridge the generation GAP, allowing the generations to hold hands and improve the quality of their lives.

In the times of COVID-19 pandemic, there was a need to resort to digital systems to continue with the life. The digital systems had to be used irrespective of the age of the users. One had to learn the digital skills to live through the tough times. There was no alternative but to go through the digital transformation.

The household appliances are generally used by the women at home. This is a general trend in our country and the scene more common in tier II cities and downwards. For the appliance companies it becomes imperative to see that



the user is well acquainted with the handling of the appliances. The brands cannot rely only on user manuals and training guides. The literacy of the women in terms of handling the appliances is important to make a breakthrough in sales. The brands are seen to educate the women about the appliances and giving real time support. The companies deploy their teams to look after the demonstration sessions and real time handling of the appliances. This also contributes to the customer relationship management. The digital literacy or in other words the technology literacy is the need of the hour to bring equality in the society.

Conclusion

The technology literacy is inherent in the lifestyles of the current ecosystem. This trend

of technology education is by default imparted to the younger generation in their way of lives. The middle aged and younger generations need to make investments and exert efforts to be aware about the technologies prevailing in the system. The companies and the Government too need to take efforts to spread the culture of digital literacy in the society to make people aware about the technologies. Technologies are double edged sword where it can have harmful effects on the lives of the society. It is the responsibility of the mankind to be aware of the new entities in our lives – The Digital Machines. Digital literacy is the key to survive in this new ecosystem of digital transformation.

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DESCRIPTIVE AND DIAGNOSTIC STATISTICAL ANALYSIS OF STRESS**A. N. Jagtap¹, A. S. Jagtap²**¹Shri Jagdishprasad Jhabarmal Tibrewala University Jhunjhunu, Rajasthan.²Department of Statistics, Tuljaram Chaturchand College, Baramati, Dist. Pune (MS).¹nilambarijagtap22@gmail.com, ²avinash.jagtap65@gmail.com**ABSTRACT**

Dealing with life's stressors is an unavoidable part of being alive. They occur when a person is confronted with life situations for which he or she has no prepared replies. Stress is an unavoidable aspect of modern life. The occurrence of some unpleasant and unwelcome events early in life can sometimes stress an individual's capacities to the point that mental and physical disability, ill health, and even death might result. We collected student stress scale questionnaires and health reports from several faculties' students, including their diet type, gender, and BMI level, for this investigation. The major goal of this study is to conduct a diagnostic examination of student stress utilizing various statistical technologies

Keywords: Stress, BMI, Health Problem, ANOVA.

Introduction

In general, young people experience physiological, social, and cultural changes as a result of family home abandonment and peer group influence during this period, which can be linked to harmful habits that affect health. In this regard, it is critical to understand how students cope with stress or which factors have the greatest impact on 'student stress,' as well as why students engage in non-adaptive behavior.

We're curious about how various aspects of stress and diet are linked to measures (such as BMI, MM, B-Fat, and BMR) and at a cognitive level (such as perceived well-being, stress or another psychosocial factor). According to research, stressful periods might lead to maladaptive behavior such as poor eating or sedentary behavior. The following research questions are presented in this study in order to address the requirement to create action in order to establish an active lifestyle that allows for the improvement of negative psychological states that are developed in university content: Is there a link between academic stress and its various dimensions, such as gender, BMI, Education levels (PG, UG), income, faculty and diet quality?

It's critical to investigate the causes of underweight and overweight. In most circumstances, overweight persons may lose a lot of weight by eating less but healthier food and exercising more. People must consume more food, more frequently, and in a healthy manner in order to acquire weight. However,

eating, particularly healthy food that contains a lot of proteins, is costly. Even if students are in good health, they can be influenced by psychological (stress, anxiety) and health issues (digestion problem, bulimia). The purpose of this study is to find out is there any significant difference in the average stress with faculties, BMI level and gender and its hypnotized as follows

H1: There is significant difference in the average stress scores of various dimensions with faculties.

H2: There is significant difference in the average stress scores of various dimensions with BMI levels.

H3: There is significant difference in the dimension of stress scores and Gender.

Literature Review

S Lakshmi Priya, J Lakshmi and K Naresh Kumar (2018)

The topic of this study was "BMI and Stress Level of College Students in Pondicherry." The primary data for this paper was gathered. In the academic year 2015, college students in Puducherry completed a questionnaire. a two-stage process the sampling approach is stratified random sampling. The population is separated into three strata in the first round of sampling. Colleges were categorised based on the kind of institution in the second stage of sampling (government or private). According to the sampling technique, 250 samples were gathered and statistical analysis was



performed on some colleges randomly picked from all colleges.

Ramón Chacón-Cuberos, Félix Zurita-Ortega, Eva María Olmedo-Moreno, Manuel Castro-Sánchez (2019)

Physical activity (PA), adherence to the Mediterranean diet (MD), and health have all been linked in several studies. Despite this, there are few studies that show a link between these practices and academic performance, particularly academic stress. This descriptive, non-experimental, cross-sectional study uses the KIDMED, PAQ-A, and the Scale of Academic Stress as key tools to examine the relationships between these variables in a sample of 515 university students. Women had higher levels of academic stress than men in the university students studied, particularly in terms of academic commitments and communicating one's own thoughts. Furthermore, university students having a body mass index (BMI) associated with being overweight or underweight were found to be the respondents with the highest levels of stress. Finally, students who did not adhere to MD had higher stress levels related to communicating their own views, but PA had no effect on academic stress. There were no relationships between stress and food quality when sex and BMI factors were adjusted in the regression model. The findings of this research have important implications for the treatment of academic stress. Although stress was not linked to food or physical activity, it was linked to a worse state of health in those who were overweight, with the treatment of stress in women being of particular importance.

Research Problem

In comparison to our parents' generation and their offspring's generation, this generation in the age range of 18 to 25 gets weary more readily than their parents. We ran across similar problem at our college, where faculties are divided into groups based on their BMI. So, we discovered that the cause of their exhaustion was their tension, which was caused by various levels of stress. Exam stress, indifference in attending lectures, and

difficulty to understand a subject are all issues that students confront in today's highly competitive environment. Academic stress is defined as mental suffering related to upcoming academic challenges or failure, as well as the fear of academic failure. Academic pressures can be found in many places in a student's life, including school, home, peer relationships, and even their neighborhood.

Objectives

1. Whether there is faculty wise any effect of different dimensions of Stress.
2. Is there any dependency of stress on gender?
3. Which activities students prefer to deal with stress?

Research Methodology

This project undergoes with primary data collection. The questionnaire was filled by the college students in Tuljaram Chaturchand College, Baramati, in academic year 2019-20. The population is divided into Arts, Commerce, and Science of age between 18to25 i.e. students of UG and PG of T. C. College. This project focused on "Body Mass Index (BMI) with stress level of college students". We had collected data from 492 participants & analysis was carried out on it. To count Stress level of a student's, permission was taken from Psychology Department for Standard Student Stress Questionnaires. The Questionnaire included some personal and social-demographic profile of students as well as 64 items stressors. The total stressors were divided into following dimensions:

1. Financial Stress
2. Family Stress
3. Social Stress
4. Educational Stress
5. Not attending Education Objectives
6. Irregular University Functioning
7. Lack of Study Facilities
8. Teacher-Students Relationship
9. Ego Threat
10. Bereavement
11. Separation
12. Personal Set-back
13. Health of Others.

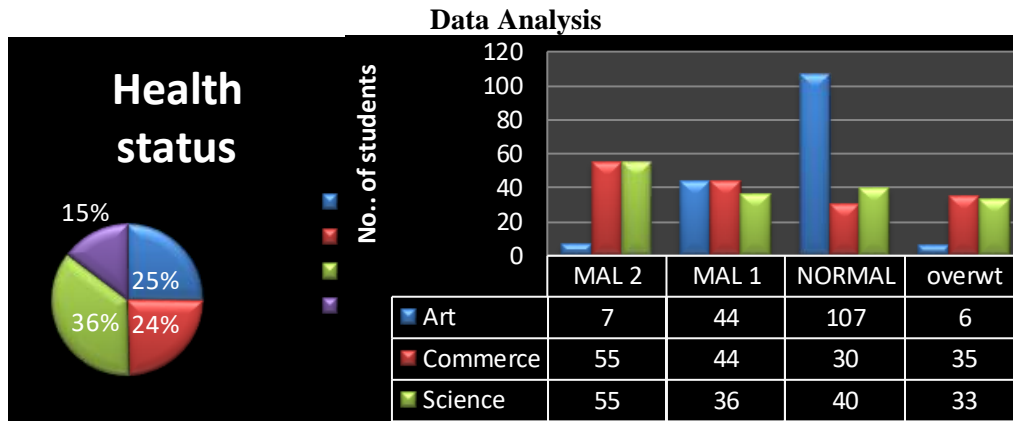


Figure 1 Health Status

Figure 2 Faculty and BMI level

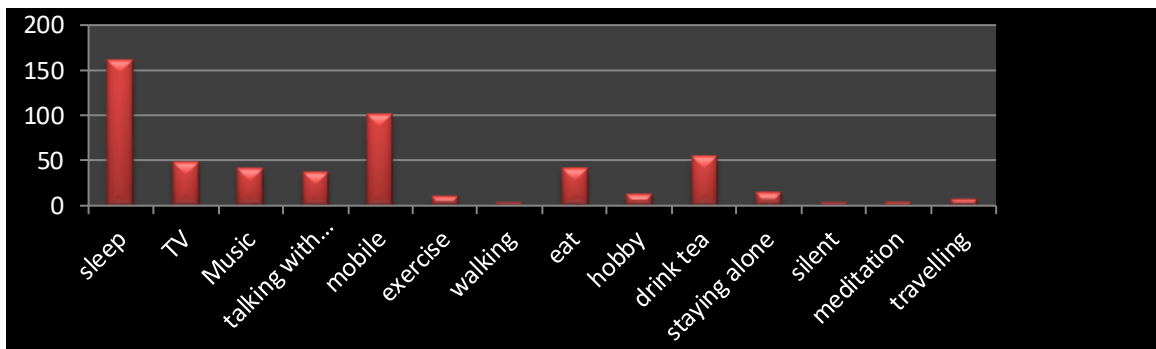


Figure 3 preferred activities by students to reduce stress

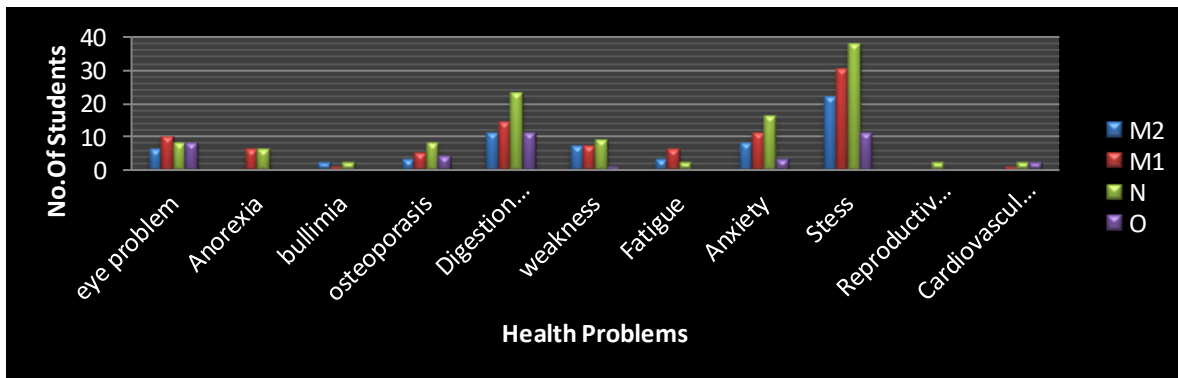


Figure 4 No. of Students Suffering from Health Problem at different Levels of BMI

	BMI	M2	M1	N	O
Diseases					
eye problem		6	10	8	8
Anorexia		0	6	6	0
bullimia		2	1	2	0
osteoporasis		3	5	8	4
Digestion Problem		11	14	23	11
weakness		7	7	9	1
Fatigue		3	6	2	0
Anxiety		8	11	16	3
Reproductive/Hormonal Dysfunction		0	0	2	0
Normal		20	22	40	12
Cardiovascular Disease		0	1	2	2

From figure 1 we see that Out of total population 50% are observed in Malnutrition level. From

figure 2 we see that Arts students are observed in Normal BMI level whereas other faculty are

approximately equally distributed in other BMI Levels. From figure 3 we see that Most of students choose to Sleep, Mobile & Tea to reduce stress which leads to unhealthy life. From figure 4 It is observed that even students have normal BMI level

they get affected by health problems (Digestion problem, Weakness, osteoporosis) & Psychological dis-function (Stress, Anxiety, Fatigue) in age group 18-25.

Table 1 ANOVA table of Faculty and Financial stress

Dimensions	Faculty	Mean	Variance	F-value	P-value
	Arts	20.02747	5.354992		
Financial	Commerce	19.94963	21.9021	1.7315	0.1781
	Science	20.71951	22.06808		
	Arts	28.27481	9.386483		
Family	Commerce	29.75933	63.20433	3.8654	0.0216
	Science	30.14634	53.47539		
	Arts	14.00849	2.815307		
Social	Commerce	13.37292	18.5643	1.3663	0.256
	Science	13.7439	16.47389		

In the table 1 Financial stress is insignificant as the p-value is 0.1781 which is more than 0.05 hence we cannot reject the null hypothesis. It can be said that there is no difference among Arts, Commerce, and Science in financial stress. In family table the p-value was found to be significance as the p-value is 0.0216 which is less than 0.05 hence here we accept the null hypothesis. It can be said that there

is significant difference among Arts, Commerce, and Science in Family stress. Social stress is insignificant as the p-value is 0.256 which is more than 0.05 hence we cannot reject the null hypothesis. It can be said that there is no difference among Arts, Commerce, and Science in Social stress.

Table 2 ANOVA table of Faculty and Educational Stress

Dimensions	Faculty	Mean	Variance	F-value	P-value
	Arts	29.79824	11.68884		
Education (a)	Commerce	27.69108	69.1039	6.0236	0.002604
	Science	29.96341	52.19497		
	Arts	12.05131	1.30427		
Education (b)	Commerce	11.00419	13.38996	6.5531	0.001554
	Science	12.01829	11.84629		
	Arts	21.49086	6.755568		
Education (c)	Commerce	21.16328	52.24878	0.12823	0.8797
	Science	21.34756	45.43061		
	Arts	10.17591	3.327496		
Education (d)	Commerce	10.68087	14.81526	2.8239	0.06034
	Science	11.02439	14.41658		

Education (a): Educational Objective, Education (b): irregular college functioning. Education (c): lack of study, Educational (d): teacher’s student relationship.

In the table 2 Educational objective stress is significant as the p-value is 0.00260 which is less than 0.05 hence we reject the null hypothesis. It can be said that there is significant difference among Arts, Commerce, and Science in Educational objective stress. In irregular college functioning

table, the p-value was found to be significance as the p-value is 0.001554 which is less than 0.05 hence here we reject the null hypothesis. It can be said that there is significant difference among Arts, Commerce, and Science in Educational stress. lack of study stress is insignificant as the p-value is



0.8797 which is more than 0.05 hence we cannot reject the null hypothesis. It can be said that there is no difference among Arts, Commerce, and Science in Educational Stress. teacher’s student relationship stress is insignificant as the p-value is 0.06034 which is more than 0.05 hence we cannot reject the null hypothesis. It can be said that there

is no difference among Arts, Commerce, and teacher’s student relationship stress.

Table 3 ANOVA table of Faculty and Personal Stress

Dimensions	Faculty	Mean	Variance	F-value	P-value
ego threat	Arts	33.17059	19.03386		
	Commerce	31.42832	116.4013	2.0085	0.1353
	Science	32.96341	89.76552		
bereavement	Arts	19.64351	5.565038		
	Commerce	18.93519	33.2248	2.6718	0.07014
	Science	20.11585	26.07852		
Separation	Arts	12.98795	1.654096		
	Commerce	12.99509	13.96114	1.1034	0.3326
	Science	13.40244	11.68981		
personal setback	Arts	31.11264	14.63701		
	Commerce	30.20303	94.73277	3.2626	0.03913
	Science	32.29268	56.19602		
health of others	Arts	20.93968	8.534907		
	Commerce	21.7119	45.36941	7.818	0.000455
	Science	23.20732	29.84633		

In the table 3 ego threat, bereavement, Separation stress is insignificant as the p-value is more than 0.05 hence we cannot reject the null hypothesis. It can be said that there is no difference among Arts, Commerce, and Science in Personal stress. In personal setback, health of others tables the p-value was found to be significance as the p-value which is less than 0.05 hence here we reject the null hypothesis. It can be said that there is significant difference among Arts, Commerce, and Science in personal stress.

In this research for checking significance between different stress score with respect to BMI level we carried out t-test and we get p value of financial stress and separation is 0.03045 and 0.0273 respectively which is less than 0.05 hence we reject the null hypothesis. It can be said that there is significant difference in financial stress and separation with respect to BMI, also we check there is any dependency between different dimension of stress scores and gender by using t-test we get the result average stress score and gender are insignificant.

Result and Discussion

While ANOVA test was conducted in Faculty and Financial stress here, we could not find any

significance difference in financial and social stress. The p-value of financial stress is 0.1781 which is more than 0.05 hence we failed to reject the null hypothesis. The p-value of social stress is 0.256 here we failed to reject the null hypothesis as the p-value is more than 0.05. For Faculty and Educational stress, we find there is insignificant difference in lack of study and teacher students’ relation. For faculty and personal stress, we find there is insignificant difference in ego threat, bereavement and separation. Also, in this research we find that there is significant difference in financial stress and separation with respect to BMI, also we check there is any dependency between different dimension of stress scores and gender.

Conclusion

However, parents and teachers can watch for short-term behavior and physical symptoms that manifest when stress becomes a problem. Since age plays a major role in how stress effects on students, the stress score will help the teachers and parents to identify the major source of stress and area requiring Emotional and Professional support.



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MARITAL PROBLEMS AND THEIR EFFECTS ON THE SOCIETY: A STATISTICAL ANALYSIS

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ABSTRACT

The amount of satisfaction of the married couple determines the success of the marriage. Meeting the expectations of the spouse is frequently related with satisfaction. The current paper analyses the data on bridegrooms and brides about their personal data and their spousal expectations. The personal information includes age, height, blood group, education, profession and monthly income. The expectation are obtained on height, education, profession and any other specific expectation. The information was gathered in Pune, Nagar, Nashik city, and Nashik district. The survey covers six gotras of the Lad-Wani community: Kashyap, Khalap, Mandav, Gahilam, and Gaut. To link personal information to expectations, statistical analysis is used. In addition, detailed analysis is carried out according to the study region. The analysis' findings are given in graphical, tabular, and other formats as applicable. In light of the findings, marriage difficulties and possible solutions are examined.

Keywords: Marital status, correlation, regression.

Introduction:

Marriages should be very sacred in India and should be considered once-in-a-lifetime. The event of marriage is part of social traditions and rituals in which both sides of family members are emotionally involved and their communities are involved to bless happy married life. However, recently, more and more married couples have suffered distress and incompatibility. Because of the different socio-economic elements, the rate of divorce and separation has increased rapidly in India as a result of discontent marriages. This unpredictable social disaster is caused by the sudden bombardment of cases involving marital problem cases, families and other courts, the police administration and various counselling cells.

It is a custom in India that in matrimonial disputes many social and legal concerns are expressed for women, but husbands and their families are ignored. The husband and his family are fatally affected if the trivial marriage disputes give the wife the form of the cruelty due to the demands of dowry made by a promiscuous woman's false intentions.

In 1983, the Indian Penal Code (IPC) introduced the Criminal Law (second amendment) Act of 1983 in order to deal with Dowry / Harassment cases. The Indian Penal Code (IPC) (Act No. 46 of 1983). It reads that whoever is subject to a cruel treatment (mental

or physical) for a sentence of up to three years and may be liable to a fine by anyone who is the husband or relative of the husband of a woman.

A section analysis reveals that four types of cruelty are addressed in this law: 1) Every conduct likely to lead a woman to suicide, 3) harassment to force women or their relatives to give some property, or 4) harassment because a woman or her relative is either incapable of ceding to the demand for money or does not share the property. 2) A behaviour which causes serious injury to women's life, limbs or health.

Wani is a Maharashtra caste; Ladshakhiya Wani are prominent among them Family names such as Yeole, Kotkar, Pate, Kothawade, Amrutkar, Shirude, Chinchore, Gahiwad and Talware are prominent among Wani families. Wani is also a surname for people particularly in the Kashmir Valley, who came for business or business from the Persian Gulf, brought craftsmanship and many other technical skills to the Kashmir Valley. In Wani there are several sub-castes. Shakhiya Wani, Wani, Wani, Wani and others. Lad, Wani, Wani, etc. Wani. Every caste person is in small companies. In northern India this caste is referred to as BANIYA. Born in the Baniya family, Mahatma Gandhi. Wani had a population of 52,814 since the 2001 Indian census. Males make up 51% of the population



and 49% of females. The average Wani literacy rate is 74%, higher than the national average, by 59.5%: men's literacy is 80%, and women's literacy is 68%. 13% of the population of Wani is under the age of 6 years. Wani was known as 'Wun' in earlier times. Wani was under British rule a District Headquarters. Subsequently Wani and his district of Dhule became taluk. Wani is located on Dhule-Chalisgaon Road, about ten kilometers from Dhule, on the east side of Dhule District.

Statistical studies have been discussed in this paper on Wani Samaj's marital problems and their social impact.

In Indian society, marriage becomes a social issue. In addition, urbanization in Maharashtra is causing increasing family disputes. This problem has become more serious over the past several years because it affects future generations. Marriages become problematic, families quickly break up, the divorce rate is rising and is not limited to the uneducated or rural part of society. Higher education people participate in more family disputes probably because of ego problems or higher education complexes. This could also have happened due to excessive media exposure and the glamour of rapid changes and western life.

It is an attempt to identify the reasons for these problems, but one of the major reasons for that phenomenon is the lack of education or balanced education. Why does our education have an imbalance? Why does society have inequality? The causes of this imbalance are very important to find. Is it because of marriages with lowly qualified couples between highly skilled people? If a physician marries another physician, marriage will succeed. Other professionals such as engineers, designers, managers, etc. are also asked the same question. If the spouses belong to various professions, is it better? If a person marries by choice, is the marriage successful (generally known as love marriage? Or are organized marriages better because several family members, including parents, evaluate the spouse? Are inter-caste marriages only a mode or a more homogenous society? Are they? Social scientists raise these and several other questions, but they are often rarely dealt with or answered due to lack or lack of data.

In society, marriages are an important body. The foundation of a stable and expanding society is marriage. To live in a healthy atmosphere, a society must base its marriage traditions and practices on sound principles and strong foundation. In the last 50 years and so, after Indian independence, the average age at marriage has progressed. Some of the main reasons for this phenomenon are higher education, urbanization and high expectations by the spouse and the lawyers. What's the correct marriage age? Unless this age can be reached, should you marry sooner or later? The younger generation is concerned about these and such issues. If you make a mistake and enter a failed marriage, you are accused. There are several people to claim the credit if they enter into a successful marriage. Parents are included. Friends in the family, lawyers and even family and neighbors.

Not only the involved (often the divorced) couple have the socio-economic and psychological effects of a fading marriage, but also their direct and prolonged family, friends, neighbors, and even distant families have the same impact. That is why we believe this subject to be extremely important and to be addressed seriously. The results are not limited to the limited range of the three districts chosen for the study. These findings will apply to the entire state of Maharashtra and to the entire country, with certain possible modifications. A good understanding of the marital issues will surely help us contribute to Samarth Bharat's dream. The country can only advance and prosper with well-wedded young people. When he/she is happily married, everyone is more creative and has a positive behavior. The attitudes of its citizens are determined by national integration. National growth depends on its young generation's social, economic and mental stability. We therefore believe that the research project proposed is of major importance for the understanding of marital problems and the development of appropriate approaches to address potential future problems.

Material and Methods:

Data is collected via a sample survey. After a pilot survey, the sample design, size and estimation methods were decided. The



opinions of experts were also obtained following the pilot survey prior to the actual survey. The survey activity included travel to various geographical areas. The survey proposed to include the three districts of Pune University, namely Pune, Nashik and Ahmednagar. A laptop is used to compute the survey data to complete data entry on time.

A two-stage survey questionnaire is developed. First, an initial questionnaire is provided for a pilot survey. The items are finalized for the survey by means of the analysis of this questionnaire. The pilot survey is used to determine sample sizes in urban-rural, caste or educational background for various social groups.

We have collected the information of 1000 bridegrooms out of which we selected 100 samples randomly for analysis. Out of population of 1000 bridegrooms, some are from abroad, out of state, Mumbai, Pune like megacities, District places, Towns, Cities, Taluka and rural areas in Maharashtra.

Here Dependent variable is Y (Marital Status) and Independent Variables are Education(X1), Age(X2), Height(X3), Income(X4), Position

of Profession(X5), Profession Place(X6), Economical condition of Family(X7), No. of Members in Family(X8), Look of bridegroom(X9), Living Place(X10), Working Hours(X11)

Various data analysis statistical methods are used for survey data. The data analysis is performed on the entire data and on data spread across different categories such as urban, rural, common-secular, caste, education, socioeconomic status, blood groups, occupation, genealogical background like gotra, astrology through horoscope (kundali).

The main methodology for the present work is sample survey. Further, interviews and literary reviews are also used. A suitable statistical methodology is used during the data collection. The statistical methodology is data verification, data validity and reliability, correlation and regression modelling and any other statistical methodology that may be relevant during the project.

Data Analysis:

Correlation for first 100 samples

		Marital Status	Education	Age Group	Height	Monthly Income	Position of Profession	Place of Profession	Economical condition of family	Members of Family	Look of Candidate	Place of Living	Hours of Profession(Working)
Marital Status	Pearson Correlation	1	.226*	.092	.012	.117	.319**	.012	.192	-.086	.235*	.049	.208*
	Sig. (2-tailed)		.024	.361	.906	.247	.001	.906	.056	.392	.019	.627	.038
Education	Pearson Correlation	.226*	1	.127	.226*	.239*	.665**	.439**	.377**	-.306**	.126	.454**	.192
	Sig. (2-tailed)	.024		.209	.024	.017	.000	.000	.000	.002	.212	.000	.056
Age Group	Pearson Correlation	.092	.127	1	-.206*	.007	.153	.039	-.152	.032	-.189	.109	.133
	Sig. (2-tailed)	.361	.209		.040	.944	.128	.697	.130	.756	.059	.280	.188
Height	Pearson Correlation	.012	.226*	-.206*	1	.234*	.202*	.252*	.211*	-.026	.187	.245*	-.135
	Sig. (2-tailed)	.906	.024	.040		.019	.044	.011	.035	.799	.062	.014	.181
Monthly Income	Pearson Correlation	.117	.239*	.007	.234*	1	.550**	.304**	.469**	-.152	.306**	.280**	-.017
	Sig. (2-tailed)	.247	.017	.944	.019		.000	.002	.000	.130	.002	.005	.866



Position of Profession	Pearson Correlation	.319*	.665**	.153	.202*	.550**	1	.453**	.418**	-.288**	.300**	.468**	.191
	Sig. (2-tailed)	.001	.000	.128	.044	.000		.000	.000	.004	.002	.000	.057
Place of Profession	Pearson Correlation	.012	.439**	.039	.252*	.304**	.453**	1	.107	-.100	.113	.922**	-.114
	Sig. (2-tailed)	.906	.000	.697	.011	.002	.000		.291	.324	.262	.000	.260
Economical condition of family	Pearson Correlation	.192	.377**	-.211*	.469**	.418**	.107	1	-.270**	.235*	.145		-.012
	Sig. (2-tailed)	.056	.000	.130	.035	.000	.000		.291	.007	.018	.149	.903
Members of Family	Pearson Correlation	-.086	-.306**	.032	-.026	-.152	-.288**	-.100	-.270**	1	-.151	-.109	-.078
	Sig. (2-tailed)	.392	.002	.756	.799	.130	.004	.324	.007		.134	.282	.443
Look of Candidate	Pearson Correlation	.235*	.126	-.187	.306**	.300**	.113	.235*	-.151	1	.073		.035
	Sig. (2-tailed)	.019	.212	.059	.062	.002	.002	.262	.018		.134	.472	.733
Place of Living	Pearson Correlation	.049	.454**	.109	.245*	.280**	.468**	.922**	.145	-.109	.073	1	-.057
	Sig. (2-tailed)	.627	.000	.280	.014	.005	.000	.000	.149	.282	.472		.572
Hours of Profession(Working)	Pearson Correlation	.208*	.192	.133	-.135	-.017	.191	-.114	-.012	-.078	.035	-.057	1
	Sig. (2-tailed)	.038	.056	.188	.181	.866	.057	.260	.903	.443	.733	.572	

Correlation for first 9 influenced factors:

Correlations^a

		Marital Status	Position of Profession	Education	Look of Candidate	Hours of Profession(Working)	Economical condition of family	Monthly Income	Age Group	Place of Living	Place of Profession
Marital Status	Pearson Correlation	1	.319**	.226*	.235*	.208*	.192	.117	.092	.049	.012
	Sig. (2-tailed)		.001	.024	.019	.038	.056	.247	.361	.627	.906
Position of Profession	Pearson Correlation	.319**	1	.665**	.300**	.191	.418**	.550**	.153	.468**	.453**
	Sig. (2-tailed)	.001		.000	.002	.057	.000	.000	.128	.000	.000
Education	Pearson Correlation	.226*	.665**	1	.126	.192	.377**	.239*	.127	.454**	.439**
	Sig. (2-tailed)	.024	.000		.212	.056	.000	.017	.209	.000	.000



Look of Candidate	Pearson Correlation	.235*	.300**	.126	1	.035	.235*	.306**	-.189	.073	.113
	Sig. (2-tailed)	.019	.002	.212		.733	.018	.002	.059	.472	.262
Hours of Profession(Working)	Pearson Correlation	.208*	.191	.192	.035	1	-.012	-.017	.133	-.057	-.114
	Sig. (2-tailed)	.038	.057	.056	.733		.903	.866	.188	.572	.260
Economical condition of family	Pearson Correlation	.192	.418**	.377**	.235*	-.012	1	.469**	-.152	.145	.107
	Sig. (2-tailed)	.056	.000	.000	.018	.903		.000	.130	.149	.291
Monthly Income	Pearson Correlation	.117	.550**	.239*	.306**	-.017	.469**	1	.007	.280*	.304**
	Sig. (2-tailed)	.247	.000	.017	.002	.866	.000		.944	.005	.002
Age Group	Pearson Correlation	.092	.153	.127	-.189	.133	-.152	.007	1	.109	.039
	Sig. (2-tailed)	.361	.128	.209	.059	.188	.130	.944		.280	.697
Place of Living	Pearson Correlation	.049	.468**	.454**	.073	-.057	.145	.280**	.109	1	.922**
	Sig. (2-tailed)	.627	.000	.000	.472	.572	.149	.005	.280		.000
Place of Profession	Pearson Correlation	.012	.453**	.439**	.113	-.114	.107	.304**	.039	.922*	1
	Sig. (2-tailed)	.906	.000	.000	.262	.260	.291	.002	.697	.000	

Regression for all 11 variables:

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.222	10	.422	1.921	.052 ^a
	Residual	19.568	89	.220		
	Total	23.790	99			

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.421 ^a	.177	.085	.469

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.490	.466		-1.051	.296



Education	.008	.058	.019	.134	.894
Age Group	.035	.051	.075	.696	.488
Height	-.014	.062	-.023	-.220	.827
Monthly Income	-.033	.041	-.107	-.817	.416
Position of Profession	.127	.073	.285	1.751	.083
Place of Profession	-.073	.100	-.194	-.734	.465
Economical condition of family	.027	.035	.096	.786	.434
Look of Candidate	.094	.053	.187	1.755	.083
Place of Living	.026	.073	.093	.357	.722
Hours of Profession(Working)	.066	.061	.113	1.081	.282

Regression Model: For two independent Variables Look of Candidate and Profession of Position
 Regression Model is

$$Y = -.543 + .006X_1 + .038X_2 - .034X_4 + .128X_5 - .073X_6 + .027X_7 + .093X_9 + .025X_{10} + .068X_{11}$$

ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	4.212	9	.468	2.151	.033 ^a
Residual	19.578	90	.218		
Total	23.790	99			

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.421 ^a	.177	.095	.466

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.543	.399		-1.361	.177
Education	.006	.057	.015	.105	.917
Age Group	.038	.049	.080	.762	.448
1 Monthly Income	-.034	.040	-.110	-.853	.396
Position of Profession	.128	.072	.286	1.768	.080
Place of Profession	-.073	.099	-.193	-.734	.465



Economical condition of family	.027	.034	.096	.787	.433
Look of Candidate	.093	.053	.185	1.751	.083
Place of Living	.025	.072	.088	.342	.733
Hours of Profession(Working)	.068	.060	.116	1.126	.263

Result and discussion:

If $Y \geq 0.5$ then candidate having chances to married. Position of Profession, Education, Look, Working Hours, Economy Condition of family,

Monthly income are the most affecting factors for marriage of bridegroom.

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ROLE OF HR IN FOSTERING HUMAN RESILIENCE TO TACKLE TOUGH TIMES

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ABSTRACT

This study deals with role of HR in fostering human resilience to tackle tough times. The role of HR is very vital in preparing a resilient workforce to deal with any crisis such as the covid-19 pandemic. This study is based on secondary research. The literature review is done using Google Scholar with search term "HR role and employee resilience". The research is also based on analysis of various articles and blogs focused on role of HR in building employee resilience. Based on the study, five strategies pertaining to the changes HR needs to make to build employee resilience are offered.

Keywords: HR, employee resilience, stress, mental health, skills, capabilities

Introduction

Strong employees have a ton to bring to the table – they are bound to be certain communicators, they are better positioned to deal with difficulties, they are more useful and are less disposed to be influenced by pressure at work. Consequently, taking everything into account, their entire wellbeing will be great also. Shockingly, it's an astounding reverse for a worker whose strength is low – they need certainty, drive and assurance, frequently achieving truancy and in the long haul, are likely going to be more powerless against infirmity, achieving non-appearance from the workplace. Affecting their psychological well-being, yet their entire wellbeing.

The workplace has become more many-sided with numerous employees working from home. This along these lines implies the lines among home and work continue to be progressively obscured. Workplace culture and standpoint needs to continue to adjust to be steady, shared and persuading. Administrators who have the entire wellbeing of their employees, will benefit from a strong workforce that are excellent and upheld to confront difficulties at home and at work (Toor, 2021).

Below are four steps for building and sustaining employee resilience:

1. Acknowledge and understand employee needs: For a business, perceive that resilience levels, causes of stress, and

copied mechanisms can vary – what causes stress for one individual could be totally unique for another. Building employee resilience will not be achieved in short time, it should be sustained and cultivated within the workplace.

2. Advance good mental health in the workplace: HR needs to guarantee the workplace is a safe space to talk straightforwardly about mental health issues giving employees a platform where they can easily communicate with their managers. This can be finished by offering guidance and training to employees to start a dialog with their managers.
3. Give more than essentially a conventional protection bundle to help the entire soundness of employees: As close to home wellbeing and the consideration on emotional wellness transforms into an undeniably significant piece of people's lives, there is likewise a creating assumption that these advantages are continued to the workplace. Accordingly, the proactive plan of worker wellbeing programs is transforming into a basic piece of building a more grounded workplace culture that can help draw in and hold talent.
4. Energize sound practices and cultivate a culture of wellbeing: Employers should instruct employees on psychological wellness issues and flexibility, bringing issues to light with regards to mental flourishing and giving work-life balance

preparing. Besides, the rollout of emotional wellness related projects that proposition pressure the executives training to employees and admittance to exhorting gatherings with clinical experts will help with empowering a cheerful and drew in workforce with help and sympathy at the core of the organization.

Following this introductory section, a literature review focused on HR role in building employee resilience is presented. Subsequently, the research methodology is briefly touched upon. It is followed with analysis and discussion section, where strategies for changes in HR to build resilience are presented. The study is concluded with findings and conclusion section.

Literature Review

There is ample research on the topic of HR role in building employee resilience. Below are a few abstracts from the recent literature.

1. Khan et al. (2019) have posited that, there has been expanding interest in understanding the factors that add to the development of employee resilience. Regardless of such interest, there is a shortage of exploration analyzing the contributory role played by HR practices in enhancing employee resilience. Taking a look at the setting of Pakistan's telecommunications sector and conveying a qualitative methodology, this paper inspects the effect of HR practices on employee resilience. The discoveries show that four critical spaces of HR practices – job design, information sharing and flow within an organization, employee benefits (monetary just as non-monetary), and employee development opportunities – empower the development of employee resilience. Subsequently, the compelling execution of HR practices here has been the critical factor for the development of employee resilience.
2. Nizamidou and Vouzas (2020) have argued that, this paper investigates how resilience may mitigate the impacts of a crisis and at the same time encourage business excellence. Additionally, it looks to analyze the role of HR department (HRD) in cultivating resilience and crisis awareness. All together for the authors to assess their hypotheses, a research model was conceptualized and tried by leading an empirical study in Greek organizations that enroll the largest number of employees in Greece, having a place with various corporate sectors. Following the survey of the relevant literature on resilience, business excellence and crisis management (CM), the research model and research hypotheses are introduced. The empirical area illustrates the statistical analysis of the collected data and the trial of the research hypotheses. The authors managed to validate their research hypotheses through the research. The research demonstrated that advancing resilience and crisis awareness in a business excellence climate can build up the role of HRD aiming to beat emergencies.
3. According to Douglas (2020), this paper aims to introduce how resilience can mitigate workplace adversity and human resource practices (HRPs) to construct capacity for resilience in employees. A survey of the literature was led for employee resilience. Resilience can mitigate the negative impacts of occupational and workplace adversity on employees. HRPs through job design, training and development and social help were found to encourage capacity for resilience in employees and backing organizational performance. Organizations can utilize the discoveries to fabricate organizational and human resource (HR) strategies to foster employee resilience.
4. Rodriguez-Sanchez (2021), has opined that, we are living in turbulent and uncertain times and organizations need to battle with these circumstances to achieve their goals. More than ever, resilience capacity is an added value that organizations need to work to react to obstacles in these challenging times.



Resilience is a capacity of individuals, teams, organizations, networks, even society, that make them to defeat setbacks (such crises, changes, or turbulences) such that they not only survive but also emerge stronger. Past research on resilience at various range of settings and gatherings show that resilience is a capacity that can be trained or develop. Therefore, the goal of this chapter is to audit the main lines of action available to organizations that want to encourage resilience at work. The chapter will audit theoretical research on workplace resilience, and empirical research that joins Human Resources Management and workplace resilience. Aspects covered incorporate the role that corporate social responsibility toward employees, career development or work–family balance have in creating resilience. The chapter closes with a conversation of some practical rules for HR managers and practitioners.

5. As per Cooke et al. (2021), consolidations and acquisitions have been a well-known system for firms to expand their upper hand. Existing exploration has uncovered a wide scope of suggestions for the workforce and human resource management (HRM) starting from M&As. Regardless, inadequate with regards to consideration has been paid to issues identified with worker flexibility. We contend that worker versatility, a thought that is still to acquire boundless consideration in HRM research, is vital to organizations wishing to deal with their M&As successfully, particularly in the post-M&A coordination. We encourage a lot of integral suggestions, present an exploration framework, and demonstrate headings for future assessments.
6. Myllykoski (2021), has set that, reliably changing working life might put pressure on progress for organizations and their employees. Along these lines, flexibility has been perceived as a fundamental determinant of progress for both at the hierarchical and the singular level. Besides, organizations work in a stunning environment, where organizations face different difficulties and vulnerabilities. Right when organizations expect to respond to difficulties adequately, employees' capacities and particularly strength have been perceived as basic accomplishment factors. This examination explores strength and its invigorating in organizations. The inspiration driving the examination is to look at how strength can be conceptualized in working life and how versatility can be sustained in organizations through human resource management rehearses. The objective is to give new data on an effective and generally little-focused on subject and to foster comprehension of the topic.
7. As per Ngoc Su et al. (2021), this review builds up how the travel industry and cordiality organizations in Vietnam made authoritative flexibility to persevere through the principle wave of the Covid-19 emergencies. With employees recognized as a basic estimation in the travel industry and cordiality benefits, the review focused in on how human resources (HR) rehearses were embraced to encourage authoritative flexibility during the emergency. Start to finish gatherings were driven with 20 the travel industry and accommodation supervisors during Vietnam's lockdown. The disclosures uncover significant HR strength building rehearses that these organizations did previously, during and after the lockdown. The results add to our comprehension of how HR practices can support the travel industry workforce and improve hierarchical strength despite a worldwide pandemic.
8. As per Ramlall (2009), this paper analyzes the conventional jobs of HR and proposes an adjusted framework concerning how HR would be a basic accomplice in helping organizations with building strength and have the choice to fight in the worldwide economy during outrageous financial occasions. Essential and optional information are used to perceive systems being used by HR bosses across the world

to alleviate the different monetary difficulties. Accentuation is put on how pertinent HR practices can be used as methods of managing pressure in dealing with the effect of these difficulties. An idea to everything is that worker attributes and surprisingly their sentiments are essential for authoritative life and an imperative game plan of elements that should be considered in upgrading hierarchical reasonability. What better way is there to collect versatility than through certain associating even in occasions with outrageous uneasiness and challenges?

9. Bardoel et al. (2014), have thought that, given fierce monetary occasions, the possibility of worker flexibility is standing out enough to be noticed in numerous organizations. This paper brings the discussion of representative versatility into the field of human resource management (HRM). We investigate the establishments of versatility in speculations of positive brain science and the protection of resources (COR); we look at its significance for HRM and cultivate a bunch of testable theories to coordinate future exploration. The chief key finding of this paper is that the possibility of strength can be made from solid hypothetical establishments. Second, a rational arrangement of strength upgrading HR rehearses can possibly add to employees' mental capital, perspectives and conduct, and to hierarchical execution in violent conditions just as during seasons of relative quiet. Given the hypothetical outlining, formal versatility preparing should be viewed as a lone piece of a more extensive, lucid arrangement of flexibility improving HR rehearses.

Research Methodology

This study is based on secondary research. The literature review is done using Google Scholar with search term "HR role and employee resilience". The study is also based on analysis of various articles and blogs focused on role of HR in building employee

resilience. Based on the study, five strategies are offered pertaining to the changes HR needs to make to build employee resilience, which are presented in Analysis and Discussion section.

Analysis and Discussion

Based on the study, five strategies and expected changes, are presented which HR should focus in order to build employee resilience.

1. The first and most basic is a shift from focusing in on building abilities to a vow to developing capacities first and abilities second. Those human abilities credits that are all around pertinent and ever-enduring, similar to interest, cooperation, innovativeness, and compassion outfit workers and organizations with more prominent flexibility to address both the present and the upcoming issues. Truth be told, in conditions where human capacities are developed and upheld, workers can reskill and rehash quicker and with greater supportability.
2. Second is a shift from making explicit workforce abilities to meet transient requirements to taking advantage of workers' interests to help with handling inconspicuous and future issues. Developing workers' interests could mean developing workers' hankering to have an effect, empowering workers to look out difficulties to work on their own presentation, or propelling a communitarian environment where workers group up and create organizations with others to acquire new pieces of information. Via doing these actions, organizations can make an interpretation of worker enthusiasm into supported hierarchical execution.
3. Third is the shift from a consideration on proper preparing to an accentuation on learning in the progression of work. Exploration shows that learning through



experience yields favored learning gains and upkeep over customary homeroom guidance. The combination of learning into the progression of work makes it more close to home to the individual and considers figuring out how to be passed on at supported occasions and in designated ways, permitting workers to all the more promptly get, outline and influence the substance.

4. Next is changing how the organization rewards people. Given the significance of consistent reevaluation to business endurance in the present violent world, organizations need to make impetuses that rouse people to constantly learn, adjust and improve. Organizations can do as such by remunerating workers dependent on ability advancement, as opposed to solely on work yield.
5. The last shift to building flexibility is secured on another authoritative reality—the ascent of biological systems. As the world ends up being more related than any time in recent memory, customary limits are obscuring and bringing about different models of work. At the authoritative level, there is the ascent of the social undertaking an organization whose mission consolidates pay advancement and benefit making with the need to respect and support its current circumstance and partner network (Volini, 2020).

These progressions in the HR strategy will assist with building worker strength in intense and testing times.

Findings and Conclusion

HR plays a vital role in ensuring employee resilience. It assumes great importance especially in testing times such as the current covid-19 pandemic. Only a resilient workforce can navigate the organization in these tough times. Resilient employees are confident communicators, better placed to handle challenges, more productive and less inclined to be affected by stress at work.

In order to build and sustain resilient employees, organizations need to — acknowledge that different employees have different needs; ensure positive mental health at the workplace; focus on whole health of employees and foster a culture of wellness.

The maximum benefits an organization can derive from a resilient workforce will depend on the HR strategy and shift in their outlook towards employees. First, the focus needs to be changed from skills to capabilities. Second, is to tap employees' passion to deal with the uncertain and unknown future. Third, is to learn on the job. Fourth, rewarding increase in skills and capabilities. Lastly, the focus should be on the entire ecosystem of the organization, not just monetary profits.

These strategies and changes in the focus will ensure employee resilience to equip the organization face any crisis.

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EDUCATION THROUGH DIGITAL METHODOLOGIES: LEARNING IN MODERN AGE

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ABSTRACT

In the modern era each field has been growing up drastically, similarly in the education field many reforms have been seen. The main transformation is happening into the educational area, it is the progression of gaining of abilities, information, skills and knowledge through study. In the present times, learning process has been reformed using Digital tools, electronic devices, multimedia etc. it can be referred as digital learning or e-learning. The term Digital Learning implies learning facilitated by the digital technologies which empowers learner to experience a freedom to do the learning in his/her own time, place, platform and pace. E-Learning or digital learning can be used for discussions, communicating views, sharing thoughts, recommending books, internet sources, videos, news or any other content related to topic. Paper carves with different parts; First part has acme the modern digital technologies in teaching-learning process. Second part defines innovative methods and implemented practices: Outlook Ballot, Smart e-Learning. These are digital techniques used to learn electronically and boost students' curiosity towards learning process. Given time and pace as per student's capability will help to boost confidence of students and help achieving effective and efficient learning process.

Keywords: e-Learning, digital learning, Use of Modern Tools in Teaching, Quality Education, mobile learning, social media in education.

Introduction

Education contributes major share on overall growth of nation. Many reforms implied on the education field. Learn with digital technology is one of them. Digital learning isn't simply learning on the Personal Computers but instead it is a blend of innovation or technology, contents and guidance gave through advanced methods. Technology incorporates the way to convey the contents to students. It very well might be combination of web, sites and equipment like desktops, tablets, advanced mobile phones (smart phones) and so on. Content is the real material to be given to the student. It might contain audio/ video recordings, power point presentations, documents, and contents in animated form. It might likewise be an intuitive programming or site created to furnish a study hall like interface with educating and evaluation of the equivalent. Instruction is the angle which requires the educator or instructor to be in a consistent touch with the digital learners and give direction and even evaluate their performance.

Thus, digital learning is a student-centric teaching process where Educators only act as

guides and develop the content for learning through various tools. The study described in different section as section II covers different

digital aids in education system, section III

describes fresh proposed method for learning. At the end, conclusions are explained in section IV.

Digital Aids

Many teaching aids are used for teaching and make teaching effective. There are various tools and pathways through which students have benefited a lot. Some of the available digital tools are as below.

Digital boards: Digital boards also called as smart boards are an effective instruction tools which has potentially replaced the age-old black boards in the classrooms for a more advanced and effective teaching and learning experience. It is a smart display screen that can be connected to a computer and serves dual purpose of a screen as well as a touch-screen board that enable teachers to draw various diagrams with ease in a short time.

These smart boards have replaced the typical



overhead projectors and have become a state-of-the-art infrastructure in many modern schools

E-books: E-books are books made available in digital format accessible through internet or various e-book apps on any desktop, tablets, kindle or even smart phones. While these books may be available free of cost, some publications however offer the books only after buying them. The main advantage of e-books is that it saves space and can be accessed anywhere, anytime unlike libraries.

Cacoo: With the help of graph, flow diagrams complex data will be described to students and suggest alternate solutions for that.

Class DoJo: Teachers used this tool mainly for student behaviour in the classroom and Performance of students which is informed to parents.

SWAYAM: SWAYAM is an initiative by the MHRD, Government of India to make education available to all without any Age limit or boundaries or other limitations. It is a whole new learning experience which can be accessed anytime and anywhere. The digital divide faced by most students in remote areas of the country is bridged through an indigenous developed IT platform than facilitates hosting of several courses taught in the classrooms from 9th class till post-graduation.

All the courses are available for free of cost and prepared by more than 1000 specially chosen teachers from across the country. Seven national coordinators have been appointed viz. the NPTEL, UGC, CEC, NCERT, NIOS and IGNOU. The courses have 4 parts such as recorded lectures, study material, assessment tests and MCQS/quizzes and discussion forums. SWAYAM is a digital platform. It provides personalized browsing experience by use of cookies.

Moodle: Moodle is a free open-source software mainly developed for learning management written in php which is providing digital control to institutions for

managing learning process in their institutions. It helps institutes create their own effective online courses, assessment etc.

Virtual Labs: It is an initiative by the Ministry of Human Resource Development (MHRD) under the National Mission on Education through ICT. Its participating institutes include all IITS, AMRITA VISHWA

VIDYAPEETHAM, AYALBAGH UNIVERSITY, NIT KARNATAKA, and COE PUNE. Areas covered by Virtual labs can be broadly classified into different domains like: Physical Sciences, Chemical Sciences, Electronics & Communications Engineering, Computer Science & Engineering, Electrical Engineering, Mechanical Engineering, Chemical Engineering, Biotechnology Engineering, Biomedical Engineering, Civil Engineering, etc.

To provide remote access to Labs of various disciplines of Engineering and Science, to encourage students to conduct experiments and develop the sense of curiosity in turn facilitating them to learn and understand basic and advanced concepts to share costly equipment and pool in resources for remote experiments are some of the objectives of the virtual Labs.

MOOCS: Abbreviation for Massive Open Online Courses is another online learning classroom which is an extension of the non-profit edx.org a global open source courses which is a leader in online learning and education. It provides courses and programs in key fields of computer science, data science, business management etc. from many institutions, composed of both leading global universities and colleges, and a diverse group of prominent organizations from around the world. Like SWAYAM, edx.org offers free courses and one can obtain a certificate for the course with minimal charges.

NPTEL: NPTEL is an initiative for obtaining certification for various courses it offers through 850 web and video courses across 23



disciplines by selected faculty members of the various IITs in India.

Spoken tutorial: Spoken tutorial is initiated by MHRD mainly focus on education through ICT and it developed IIT Bombay. It provides courses in the software training by demonstrating activities performed on the screen with audio explanation alongside. It

also provides a discussion forum where you can participate in existing discussion or start a discussion on a new topic. Registration is free.

Webinars: These are simply seminars held over the internet enabling people to attend conferences and live seminars without physically attending them through web conference.

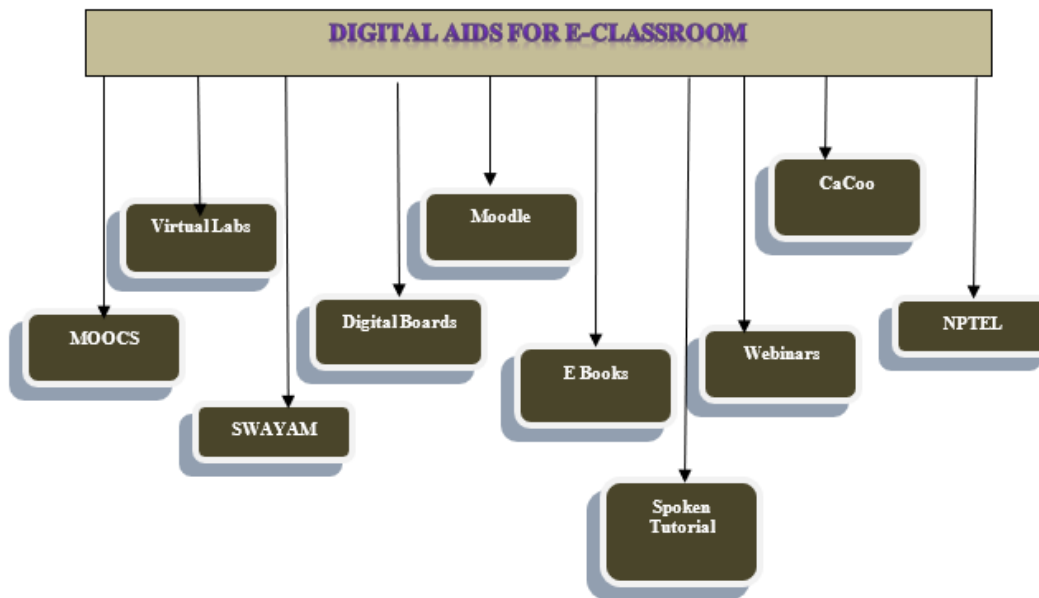


Figure 1. Digital Aids

Proposed Method

Author has proposed and implemented some new and innovative methods for students and encourage their active participation in study to make effective teaching-learning process.

1. Outlook ballot:

Author has created a group of all students and teacher. After class, group members or teacher can share the views, discussions, videos related to specific covered topic in lecture. Following is one activity shown with its implementation.

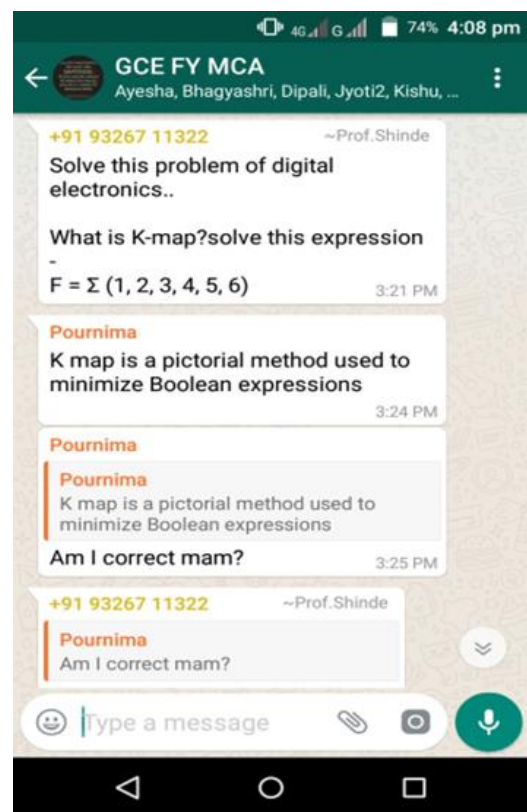


Fig 2. Teacher assigned problem on group

Fig 2. Shows that teacher has assigned problem on the group, student's shares difficulties, some members ask tricks for getting answer, shares different ways to solve the problem, discuss about correct solutions etc. Fig 3. shows how ballot is used for the learning.

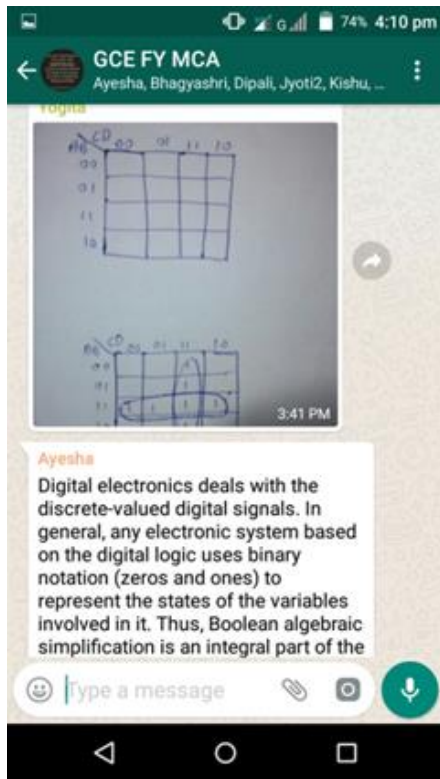


Fig 3. Learning with outlook

Observations:

After the implementation of said method author has observed that:

1. At the starting, few students are participating in the ballot. After some days' participation of students is increased and all students are available on the outlook and share their views.
2. Students are motivated to complete the assignment, because of inspiration and participation of group members.
3. Students are attracted towards subject, hence gain lots of knowledge.
4. Availability of on-the-go gives handy access to students.

2. Smart E-Learning:

Teacher can share documentation files - notes, presentation etc. to all students, on their smart mobile phones. When teacher explains the topic from file, students has the source documentation file so they can make interpretation of points in document and the explanation.

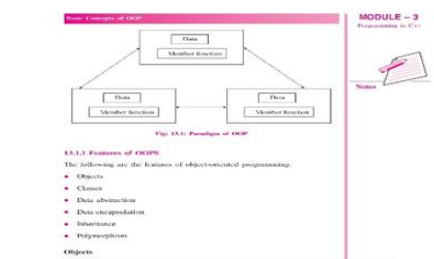
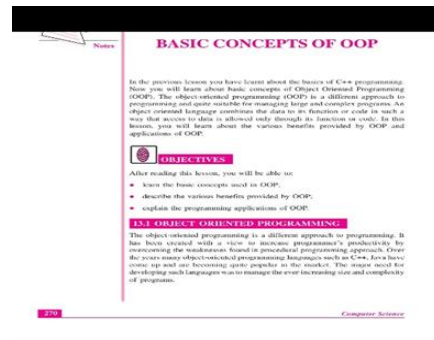


Fig 4. Presentations on smart device

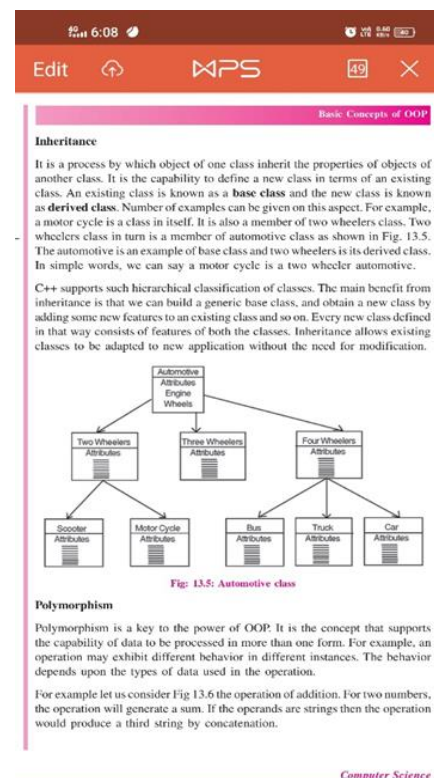


Fig 5. Presentations on smart device





Fig 6. Learning with Smart Phones

Observations

1. It has been observed that students give more attention in a class.
2. Students can highlight important points; can note extra points or shortcuts into document digitally.

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3. It is observed that with this aid, involvement of students is high than other techniques.

4. This technique has some benefits like save the time to draw diagrams; students can view notes any time even in travelling also.

Conclusion

The study describes different digital aids in education field. Some novel methods Outlook Ballot and Smart E-Learning are introduced to make learning effective and efficient. Recommended innovative methods implemented and it is observed that participation of students is high which cultivates learning process, enhance understanding and overall development of students. Proposed methods are useful for the individual or group study and can be used at home as well as at college also. Some benefits can provide the proposed methods are access to e-learning material, collaborative learning, communication etc. Handiness of proposed methods makes it even better as compared to conventional learning methodologies.

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N.S.S. FOSTERING HUMAN RESILIENCE: CATALYST FOR MANAGEMENT, SCIENCE AND TECHNOLOGY: Post Special Camp CASE Study

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ABSTRACT

In the era of Globalism, society traversing in fusion of 'science, management and technology'. Such fusion produces several changes, challenges and chances to enhancement for society especially youth. In such environment, minor mistake in appreciation due to perceptual and misperception aspects is create lot of unsolvable problem in youth profile. In such a situation, if there is 'Resiliencies' in human instincts, it helps in recovering quickly from difficulties and concrete the way for progress. This study expounds the role of 'National Service Scheme' creating Resiliencies' in youth instincts for pioneer of youth profile. With the motivation of "Horizon is nothing but Appreciation of boundaries".

Keywords: Youth, Youth profile, Factors affect youth profile, Resiliencies.role of NSS in creating Resiliencies'

Introduction

In today's age, world is traversed in fusion of sciences, management and technology, based on the concept of globalization. While globalization has led to a massive increase in trade and cultural exchanges, the world has become increasingly interconnected. As a result, the competitive environment tends to increase. In such an environment, a minor mistake, misunderstanding, or misunderstanding can cause a lot of problems. As a consequence, such the problems become more sensitive in the stressful lifestyle, increasing urbanization and single-family arrangements. Furthermore, it creates an uncertain lifestyle with a 'depressing or motivating' as fusion environment. As a result, mankind needs to adopt 'Resilience' to overcome such a fusion environment.

The aim of this paper is to abstract the role of national service scheme (N.S.S), in fostering Human Resilience of the 'Youth profile'. Section II defines role of national service scheme fostering Human Resilience of the 'Youth profile'. In section III, Definition of Research Methodology used in study, In section IV, Observation and Discussion, way to pioneer the youth profile. In section V, Conclusion and feature scope Appreciation.

Section-II: Role of NSS in social aspect

Today's Youths are challenge or opportunity India has the youngest population in the world. While India's young population is India's most valuable asset, at as same time it is the most challenging for India [1,3]. It is

imperative that we, as Indians, must take hones efforts to transfer this youth as a human capital [1,2].

In this case, we realize that the Internet (balance invention of science, management, and technologies) provide various way of progress in front of us. The mind-blowing mobility of internet access extends the opportunities to learning and doors to earning due to the rise of networking start-ups and companies.

Influence of Internet's glimmer is producing 'double-edged' influence. Its proper utilization gives very good result but its misuse produces uncontrolled effect. There are lot of chances that our youth power may easily fall prey to frustration, depression, and boredom [3,5]. It is very big constrain exactly which manner we avoid the consequences. So, there is need to think over such policy that will assist to our youth power to transfer such double-edged tools challenge in opportunity for creation good human capital.

In today's 'Covid -19' pandemic era we abstract benefits of fruitful utilization of Internet. Moreover, we must accept that world is transfer form highway to i-Way. Furthermore, it is proven with various incident that, "It is very difficult to find our balance, or swim against the tide, or, recover and regain stability". In this situation, 'Resilience' is very effective concept because 'Resilience' is such strategies that assist us to maintain balance in our lives during difficult or stressful periods and can also protect us from the development



of some mental health difficulties and issues. There are different of resilience, but it can be summarized in Inherent resilience, Adapted and Learnt resilience [4].

Constrain

It is very difficult to cater 'Resilience' concept for our Youth in themes learning era. Unfortunately, with our education system we make awareness about it but can't provide practical experience about it. So it is very big constrain how we make such policy that fostering human resilience in our youth to gain stable youth profile for uphold positively impact of Management, Technology and Science.

Opportunity

Since 1969, the National Service Scheme (NSS) has been successfully implemented at the college level with the motto "not me but you". The primary objective of this scheme is developing the personality and character of the youth by understanding the problems of the society, serving the society and their knowledge. It concert to promote social welfare among the students, by the two activity ('Regular program activity' and 'Winter Special Workforce Rites Camp'). These two initiatives help students to build and enable patriotism, national unity, all religions, tolerance and social commitment through volunteer services [6,7].

Under the National Service Scheme, 'Winter Special Workforce Rites Camp' are organized for 7 days. Through this, the youth have to live as a volunteer in the adopted village rather than home place. So naturally life experiences the opposite of daily life. Forward these volunteers comes contact with different communities, have an opportunity understand different social problem, different social lifestyle. In this 7-day volunteer contribute to activities are being developed to address the needs of the society. These include education and literacy, health, family welfare and nutrition, hygiene and sanitation, environmental conservation, social service programs, programs to improve the status of women, product-oriented programs, disaster relief and rehabilitation, campaigns against

social evils, public awareness digital India, Skill India. Dissemination of yoga about major government programs etc.

So, this study, seeks "opportunity fostering human resilience in our youth to gain stable youth profile for uphold positively impact of Management, Technology and Science with National service Scheme".

Based on it here we set the hypothesis "N.S.S. fostering human resilience: Catalyst for Management, Science and Technology"

Section –III

To systematically evaluate the hypothesis, research methodology is important way. Research method mainly classified in two type Quantitative and Qualitative. Quantitative research study carried out with number and statistics and Qualitative research deal with case study. In this study to evaluate the hypothesis both methods are utilized separately.

Our hypothesis is "N.S.S. fostering human resilience as a Catalyst for Management, Science and Technology."

Ho: "N.S.S. fostering human resilience: Catalyst for Management, Science and Technology."

Ha: "N.S.S. is not fostering human resilience: Catalyst for Management, Science and Technology."

a) Quantitative research study

Data Collection : Data is collected from the Volunteer, Campier and villagers as source.

Data collection tools : A Survey was carried out in the format of standardized Questionnaire (Feedback from) on the basis of Likert scale. (By using "Survey Heart" Mobile App free ware)

Analytical Tools : Descriptive statistics by Grouping and Visualizing by graph.

b) Quantitative research study

Case study research: The case study method has used at number of areas like education, social sciences and similar. This simplest ways of conducting research by using event as case happen in past. Study the case in depth rather than extent.



Observation and Discussion

A) Quantitative research study

Question : Winter Special Workforce Rites Camp Beneficed																						
<p>Result in Percentage</p> <p>शिबीराची उपयुक्ता</p> <table border="1"> <thead> <tr> <th colspan="3">Results</th> </tr> <tr> <th>Options</th> <th>%</th> <th>Count</th> </tr> </thead> <tbody> <tr> <td>गावाच्या विकासासाठी</td> <td>45.69</td> <td>53</td> </tr> <tr> <td>शिबीराचीच्या विकासासाठी</td> <td>1.72</td> <td>2</td> </tr> <tr> <td>गावाच्या व शिबीराचीच्या विकासा...</td> <td>51.72</td> <td>60</td> </tr> <tr> <td>महाविद्यालयासाठी</td> <td>0.86</td> <td>1</td> </tr> <tr> <td>कोनासाठीच नाही</td> <td>0.00</td> <td>0</td> </tr> </tbody> </table>	Results			Options	%	Count	गावाच्या विकासासाठी	45.69	53	शिबीराचीच्या विकासासाठी	1.72	2	गावाच्या व शिबीराचीच्या विकासा...	51.72	60	महाविद्यालयासाठी	0.86	1	कोनासाठीच नाही	0.00	0	<p>Graphical Representation</p> <p>शिबीराची उपयुक्ता</p> <p>PIE CHART</p> <ul style="list-style-type: none"> गावाच्या विकासासाठी - 53 शिबीराचीच्या विकासासाठी - 2 गावाच्या व शिबीराचीच्या विकासासाठी - 60 महाविद्यालयासाठी - 1 कोनासाठीच नाही - 0
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<p>Result in Percentage</p>	<p>Respondents give more than 89 % positive response in the favour of Winter Special Workforce Rites Camp Superiority</p>																					

B)

Quantitative research study

Case Study: There are lot of incident and case are available with us in that NSS volunteer are cope with any disaster's situation from 1972 drought to Covid -19 Pandemic. Apart from that here mention Our College's NSS volunteer's perspective story. Our NSS student (name is not given as privacy Ethics) is lives at the bank of Nira River. On 7 July 2019, society located at the bank of Nira River

is suffered from flood. In such situation, With Covid -19 pandemic phobia, our three-student come in front rather than depress. In the cooperation of villagers our student makes the living and food arrangement for the people who suffered from Nira river flood. These students submitted themes handwritten report of this incident. The report in in following table.

Table 2: Report and photograph of Nira river Bank at flood

Hand written Report	Flood Situation	
		

Making Temporary Shelter for Flooded people



Observation and discussion

The above two methods outcome indicates our NSS volunteers are capable to adapt and bounce back when something difficult happens in our lives. With case study our NSS volunteer show the ability to once again preference mankind in trauma or painful experience. In such digital eras of science, management technology's one click respond's environment Our NSS volunteer develop mechanisms for protection against practices

that could be over powering as per resilience aspect. Since '1970's drought' to 'Covid -19' Pandemic situation, there are various incident are available with us that proves NSS is a pronounced practical oriented schema of the Government of India' in the field of youth work in the world. 'It provides opportunity to student to build-up ideologically inspired profile. That is very important to avoid fusional influence Science, Management and Technology. It provides the opportunity for



youth understand the human resilience for enjoy the horizon of Science, Management and Technology. The prominence of NSS's role in

youth profile is also abstracted by Tata Institute of Social Sciences (TISS) [8].



Figure 1: Indian 'Youth profile' existence

This is directly indicate that hypothesis is proven positively "N.S.S. fostering human resilience: Catalyst for Management, Science and Technology" Section –V

Conclusion and further work

In the concluding, this study accepts the role N.S.S. fostering human resilience as a Catalyst for Management, Science and Technology. Base on that, it have arrived that our youth profile must be enhance by "Making development and deployment step efficient by

eliminating inefficiencies for tries to reduce confusion and increase appreciation level by adding values of human resilience.". This will happen when forerunner focus on 'Youth' and it's need and grip it with technological friend hood management on the basis of human resilience philosophy established on science to accomplish the progressive path. This study appreciate that it is very initial effort in this direction. There is need complete exclusive effort that will explore each and every aspect and its influence clearly.

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