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From The Chief Editor's Desk

We take pleasure in presenting our 'JUNE 18' issue on a positive note since during 2018, India's economy is slated to become the fastest growing economy of the world as per the report of the International Monetary Fund (IMF), which reaffirmed on June 27, 2018, that India will be the fastest growing major economy in 2018, with a growth rate of 7.4 per cent and it is also expected to rise to 7.8 per cent in 2019 with medium-term prospects remaining positive.

The IMF's Asia and Pacific Regional Economic Outlook report said that India was recovering from the effects of demonetization and the introduction of the GST. "The recovery is expected to be underpinned by a rebound from transitory shocks as well as robust private consumption."

It is a motivating news for all the countrymen. In this back-drop, we have published some of the finest research papers and articles in the present issue:

Raja Sarkar reviewed India-Japan Economic Co-operation in his paper on the subject. Dr. Bateshwar Singh studied the role of Regional Rural Banks of India in the present scenario. *Dr. Bibhu Prasad Sahoo and Karman Kaur analysed online purchase behaviour of college students.*

Anu Sayal, A.P. Singh and Deepak Aggarwal reviewed nebulous models of inventory management. Whereas, Alipta Dutta and Dr. Rajesh Manchanda studied the role of social media on quality of baking services in India. Prabhjot Kaur and Shailee Parmar made a comparative analysis for evaluating employees' attrition rate.

Dr. Sukhvir Singh and Mrs. Preetinder Kaur researched on Media Marketing in Dell Technology. Dr. Pragya Priyadarshini Harsha and Dr. Ashish Mathur assessed the role of social media as a tool for acquiring talent. *Chette Srinivas Yadav and others discussed the factors that affect the purchase of solar Panels.*

Dr. Rajeev Srivastava studied a predictive model for effective E-waste management in India. Last, but not the least, Dr. Mamta Bansal and Rohit Dhiman brought forth the relevance of FSSAI in our country.

Hope the readers will enjoy reading the articles and also apprise us of their valued feedback.

Sincerely,

Prof. V. K. Tangri
Chief Editor

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INDIA-JAPAN ECONOMIC COOPERATION: PROSPECTS AND CHALLENGES

ABSTRACT

India's growing economic might in recent years has seen the country adapting its economic policy towards several countries to enhance its global influence and status to meet the ever increasing challenges of the 21st century economy. As a result, India-Japan relations have undergone a tectonic shift which is directed towards building a strategic and global partnership between the two countries. India and Japan share a special relationship as fellow democracies with mutual interests and with a similar desire to seek peaceful resolutions of conflicts and greater economic engagements in Asia. The signing of the Indo-Japan Economic Partnership agreement (EPA) in February, 2011 and its subsequent implementation in August the same year was seen as a major breakthrough in the economic cooperation between the two countries which could boost bilateral trade and investment relations between two very large economies in the world. The emergence of Japan as one of the leading economic powerhouse in the world has been possible due to intricate planning at economic, political and social levels. The economic development of any country vis-á-vis the rest of the world depends on a number of factors, such as share in world trade, finance and investment. Current and future economic and population dynamics in both the countries mean that India-Japan relations will continue to improve not just politically but also in economic terms. The present paper will try to find the future prospects and challenges in the economic cooperation between the two nations.

Keywords: India, Japan, Economy, Trade, Cooperation

INTRODUCTION

India, since the economic reforms of 1991 has been growing at a rapid pace and expanding its trade resulting in massive increase in foreign investments. Japanese government extended massive support in the form of large overseas development assistance to India and went on to become her largest bilateral donor during this period. Despite that, Japan's contribution in India's global trade as well as foreign investment steadily declined during this period. It's really strange that two large economies having so much complementarities and synergies have trade partnership which is so much underutilized. The situation has started changing only in recent years. The signing of the Comprehensive Economic Partnership Agreement (CEPA) which came into effect from August 2011 marked a new beginning in Indo-Japan economic relationship. Although, cultural ties between India and Japan as been in existence since 7th century through the spread of Buddhism in Japan, the relationship remained mostly indirect for many centuries. It's only since the mid 19th century, that the relationship has become direct in nature. Post India's independence in

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1947, both countries opened a new chapter as two sovereign and two of the largest democracies in Asia. Between 1960s to 1980s, bilateral relations between the two countries were mostly inactive because of diverse approaches towards international politics and management of domestic economy. Post the Indian nuclear test in 1998, Japan even suspended all economic assistance to India for 3 years. The relationship was defrosted post the visit of Japanese Prime minister to India in 2000. Today, prolonged economic slump along with fast ageing workforce in Japan and the high growth along with massive young workforce in India are redefining bilateral relations between the two countries with the emergence of India as an economic superpower.

OBJECTIVES

i)   To find out the existing levels and patterns of trade between India and Japan

ii)   To analyze the challenges and future prospects in the economic cooperation between India and Japan

INDIA VS. JAPAN AT A GLANCE

INDIA	JAPAN
India is a subcontinent.	Japan is an archipelago, an island nation.
The Indian subcontinent has been subjected to repeated invasions and foreign rule.	Japan has never been under foreign rule except the Allied occupation during 1945-1952.
The current population of of India is approximately 1.33 billion based on the latest United Nations estimates. This population is equivalent to 17.86 % of the total world population. 32.8% of the population is urban. The median age in India is 26.9 years.	The current population of Japan is approximately 126 million based on the latest United Nations estimates. It is equivalent to 1.68% of the total world population. The median age in Japan is 46.9 years.
Adult literacy rate is 74.04% with male literacy at 82.14% and female literacy at 65.46% as per the 2011 Census	Adult literacy rate is almost 100%.

INDIA	JAPAN
India is a federal union comprising 29 states and 7 union territories. The states and union territories are further subdivided into districts and further into smaller administrative division. There is a parliament at the Centre in Delhi and similar parliaments called assemblies for each state, which are further sub-divided in to smaller administrative structures called Districts. Each District has its administrative capital. As of 2016 there are a total of 707 districts in India.	There is no concept of states in Japan, and therefore there are only the central Japanese goverment and local or municipal goverments (such as Tokyo metropolitan governments and other prefectures, and cities, wards, towns and village). Some of the local and municipal governments such as Tokyo metropolitan governments are important, and local or municipal government have their governors/ mayors and Assembly or council; however, the central Japanese government and the Diet are quite important.
Distributed and decentralized administration.	Although local governments' autonomy has been paid attention to, relatively, there is unified administrative structure.
The Indian Constitution lists 22 language with numerous dialects.	The Japanese Constitution is described in Japanese only.
The Indian subcontinent has different climate and topography depending upon the region, ranging from desert, snow, tropical and dry climate.	Japan has four seasons which are relatively uniform.
Indian business culture (and to an extent social culture) is relatively informal. The business culture, recently, is developing to be much closer to the American business culture.	Relatively formal and hierarchical culture, both social as well as business; however, depending on the time and place, this may informal. Formality is observed by persons in Japan according to the relevant situation.
Leadership or top driven.	Said to be consensus driven; however, depending on the place or situation, leadership or top driven.

INDIAN EXPORTS TO JAPAN

Agricultural products, Fresh fruits and dried fruits, Fruit juices and concentrates, Vegetables, Oilseeds, Vegetable oils and fats, Edible nuts, Sugar and honey, Grains and Pulses, Wheat, Tea, Coffee, Spices and herbs, Tobacco, Leather garments and goods, Handicrafts, Carpets, Cashew, Fisheries products, Cotton, Animal feed.

JAPANESE EXPORTS TO INDIA

Heavy machines, Electronic gadgets, Electronic spares, Toys, Gaming systems, Pharmaceutical products, Biotechnological products and Transport equipments etc..

PRESENT INDO-JAPAN TRADE STATUS

Economic relations between India and Japan have vast potential for growth, given the obvious complenientarities that exist between the two Asian economies. Japan's interest in India is increasing due to variety of reasons including India's huge and growing market and its resources, especially the human resources. The signing of the historic India-Japan Comprehensive Economic Partnership Agreement (CEPA) and its implementation from August 2011 has accelerated economic and commercial relations between the two countries. During the visit of Prime Minister Modi to Japan in September 2014, PM Shinzo Abe pledged $35 billion in investment in India's public and private sectors over the next five years. The two countries also set a target of doubling Japanese FDI and the number of Japanese firms in India by the year 2019.

Bilateral trade between the two countries more than doubled between 2006-07 and 2012-13. However, total trade has come down to $ 14.51 billion in 2015-16 from a peak of $ 18.5 billion in 2012-13. In 2015-16, India's exports to Japan were $ 4.66 billion while imports were $ 9.85 billion. In 2016-17, India's exports further fell by 17.38% to $3.85 billion and imports by 2.2% to $9.63 billion. The negative or slow growth in trade with Japan is a matter of concern for India in view of the fact that there is high potential for faster progress on goods and services trade. The share of India-Japan bilateral trade in Japan's total trade has been hovering around 1 per cent but it is in the range of 2.05 to 2.34 per cent of India's total trade in the last five years. The export-import statistics for the last five years as per India's Ministry of Commerce data bank are as follows:

INDIA-JAPAN COMPREHENSIVE ECONOMIC PARTNERSHIP AGREEMENT (2011):

This was India's 3rd Comprehensive Economic Partnership Agreement (after Singapore and South Korea) and India's first with a developed country. The Agreement is the most comprehensive of all the agreements concluded by India so far as it covers more than 90% of trade, a vast chunk of services, investment, IPR, customs and other trade-related issues. Under the India-Japan CEPA only 17.4% of the tariff-lines have been offered for immediate reduction of tariff to zero % by India. Tariffs will be brought to zero in 10 years on 66.32% of tariff lines to give sufficient time to industry to adjust to the trade liberalization. The Japanese side has put 87% of its tariff lines under immediate reduction of tariff to zero. A large number of these items are of India's export interest e.g. seafood, agricultural products such as mangoes, citrus fruits, spices, instant tea, most spirits such as rum, whiskies, vodka etc, textile products such as woven fabrics, yarns, synthetic yarn, readymade garments, petro chemical & chemical products, cement, jewellery, etc. The exclusion list of Japan (where no tariff concessions are proposed) mainly consists of items such as rice, wheat, oil, milk, sugar, leather and leather products. The trade volume of items in the Japanese exclusion list is only 2.93%. India's exclusion list contains 1538(13.62%) lines at the 8 digit level. Auto parts and agricultural and other sensitive items have been kept out of the liberalization schedule. Under India-Japan CEPA, the Japanese government shall accord no less favourable treatment to the applications of Indian companies than that it accords to the like applications of its own persons for drug registration. This will greatly help Indian pharmaceutical companies. Under India-Japan CEPA, Indian professionals will be able to provide their services and contribute towards further development of Japan's IT Sector. Japanese side has also agreed to conclude Social Security Agreement within a

specified period (3 years). Contractual Service Suppliers (CSS), Independent Professionals (IPs) such as Accounting, R&D Services, Tourist Guide, Market Research; and Management Consulting firms now can provide services in Japan. Under the India-Japan CEPA, India will be benefited by Japanese investments, technology and world-class management practices that come with it. Japan can take advantage of India's huge and growing market and resources, especially its human resources. The Agreement which is comprehensive in nature will further strengthen India- Japan economic ties to the benefit of both countries immensely. CEPA provides a win-win situation for both the countries.

JAPANESE INVESTMENTS IN INDIA

Regarding investment, India has been ranked as the most attractive investment destination in the latest survey of Japanese manufacturing companies, conducted by the Japan Bank for International Cooperation (JBIC). Japanese FDI in India has increased in recent years but it still remains small compare to Japan's total outward FDI. In terms of cumulative FDI inflows into India, Japan is now India's third largest source of FDI. Japanese FDI in India grew exponentially from US$ 139 million in 2004 to all time high of US$ 5551 million in 2008 due to mega deals particularly acquisition of Ranbaxy by Daichi Sankyo. In the last two years, Japanese FDI into India increased from US$ 2.08 billion in 2014-15 to US$ 2.61 billion in 2015-16 and further to US$ 4.24 during the first nine months of FY 2016-17. The amount of Japan's cumulative investment in India since April 2000 to December 2016 has been US$ 25.215 billion, which is nearly 8 per cent of India's overall FDI during this period. Japanese FDI into India has mainly been in automobile, electrical equipment, telecommunications, chemical and pharmaceutical sectors.

Year	Japanese FDI in India (million US$)	% change
2001	150	(-14.3)
2002	146	(-)2.7
2003	124	(-)15.1
2004	139	12.1
2005	266	91.4
2006	512	92.5
2007	1506	194.1
2008	5551	268.6
2009	3664	(-)34.0
2010-11	2864	(-)21.8
2011-12	2326	(-)18.8
2012-13	2786	19.8
2013-14	1718	(-)38.36
2014-15	2084	21.3
2015-16	2614	25.4
2016-17	4709	80.15

The number of Japanese affiliated companies in India has grown significantly in recent years. As of October 2016, there were 1,305 Japanese companies that are registered in India, an increase of 76 companies (6%) compared to 2015. These companies had 4,590 business establishments that are operating in India, which is an increase of 173 establishments (3%) compared to 2015.

JAPANESE OFFICIAL DEVELOPMENT ASSISTANCE (ODA)

Japan has been extending bilateral loan and grant assistance to India since 1958. Japan is the largest bilateral donor to India. Japanese ODA supports India's efforts for accelerated economic development particularly in priority areas like power, transportation, environmental projects and projects related to basic human needs. A noticeable positive trend in these years is that even as amount committed has stabilized or gone down somewhat, actual disbursement has increased. From 2007-08, Japanese side has introduced a Double Track Mechanism for providing ODA loans which allows us to pose project proposals to the Japanese side twice in a financial year. The interest rates applicable from April 2013 are : 1.4% per annum of general projects with a 30 years tenure including a grace period of 10 years. For environmental projects, the interest rate is 0.30% per annum with a 40 years tenure including grace period of 10 years. From April 2013, JICA has abolished levy of commitment charges and has introduced Front End Fee payable one time at the rate 0.2% at the beginning of the project. On the 0.2% Front End Fee, 0.1% will be reimbursed if the project is implemented within the stipulated time. Commitments and Disbursements of ODA loan from Japan for last several years has been as follows:(In Billion Yen)

Year	Commitment	Disbursement
2002-03	120	81
2003-04	125	80
2004-05	134.466	68.85
2005-06	155.458	68.68
2006-07	184.893	55.47
2007-08	225.13	94.65
2008-09	236.047	122.56
2009-10	218.2	128.95
2010-11	203.566	123.84
2011-12	134.288	139.22
2012-13	353.106	113.964
2013-14	365.059	144.254
2014-15	71.39	74.36
2015-16	400	390

SPECIFIC PROJECTS AND INDUSTRIAL CORRIDORS

i)   The DMIC - a flagship project of Indo-Japanese cooperation, its implementation of the project is in progress. Indian Government, through the Delhi Mumbai Industrial Corridor (DMIC) Project, is in the process of initiating a new era of industrial infrastructure development with the creation of new generation smart cities across six Indian States.

ii)   In addition to new manufacturing hubs, DMIC will envisage development of infrastructure linkages like power plants, assured water supply, high capacity urban transportation and logistics facilities as well as important interventions like skill development programme for providing employment opportunities of youth.

iii) The master planning of the DMIC New industrial cities has been carried out by the world class international consultants. Engineering, Procurement and Construction (EPC) contracts for approximately Rs. 3200 crore have been awarded in Dholera in Gujarat, Shendra in Maharashtra, Vikram Udyogpuri in Madhya Pradesh and Integrated Industrial Township Project at Greater Noida.

iv)   In Dholera, the roads and services work has been awarded to M/s Larsen & Tubro while the similar work for Shendra and Integrated Industrial Township Project at Greater Noida have been awarded to M/s Shapoorji & Pallonji. Construction has started at all the project sites namely at Vikram Udyogpuri in Madhya Pradesh, Shendra in Maharashtra, Dholera in Gujarat and Integrated Industrial Township at Greater Noida.

v)   Shareholders' Agreement (SHA) has been executed with the State Government of Madhya Pradesh, Uttar Pradesh, Maharashtra and Gujarat. Accordingly, SPVs for the Integrated Industrial Township Project at Greater Noida, Uttar Pradesh; Vikram Udyogpuri near Ujjain in Madhya Pradesh, Phase-I of Shendra Bidkin Industrial Park in Maharashtra and Dholera Special Investment region in Gujarat have been incorporated. The equity of the State Government and DMIC Trust has been released/transferred to the SPVs.

vi)   Earlier, environmental clearance has been obtained and Digital master planning/ Information and Communication Technology Master Planning work is completed for almost all the projects. The cities are being benchmarked against the world class standards of sustainability and eco-friendly developments.

vii) DMICDC has also commissioned a 5MW Model Solar Power Project at Neemrana, Rajasthan with latest cutting edge Japanese technology and the power is being supplied to the grid. DMICDC is also implementing a smart solution for Logistic sector by creating a Logistics Databank for near to real time tracking of the movement of the containers so as to bring in efficiency in logistics value chain in partnership with NEC Corporation of Japan. The regulatory and statutory approvals have been obtained and the trial operations will start shortly.

viii) DMICDC has prepared the DPRs for MRTS projects for Ahmedabad- Dholera in Gujarat and Manesar- Bawal in Haryana, awaiting approval from State Govts. States to start Land acquisition process for taking the projects forward.

ix)   In Principle, approval has been obtained for Greenfield International Airport at Dholera (Gujarat) and Site clearance has been obtained for the Greenfield Airport at Kotkasim (Rajasthan).

REASONS BEHIND INDIA'S ATTRACTIVENESS TO JAPAN

India is one of the most attractive investment destinations because of various reasons including stable government, rule of law (albeit slow), big consumer class coupled with a rapidly growing middle income class, and a large literate young population. There could not be a better source to confirm this than the United Nations Commission on Trade and Development ("UNCTAD") World Investment Report 2016 , wherein India ranks as the 3rd most prospective top destination (after the United States of America and China) by multinational corporations. Thus, the attractiveness of India is beyond doubt.

The interaction between Japan and India on the social-political as well as the economic front is, one may say, recent, unlike India's long interaction with Russia, UK (and other parts of Europe) and the United States. However, the amiable relationship between the two countries and the past economic and cultural association are strong points in the Japan-India relationship. Both countries complement and supplement each other. Japan is a technology rich country with superior management and other techniques, but is concerned about the issues of availability of manpower and is facing a population decline. Japan needs to invest outside in order to maintain its growth momentum. India is rich with natural resources but short of technology, management techniques and lastly, capital. This presents a unique opportunity for both countries to come together for mutual benefit not only in the economic field but also for geopolitical reasons.

CHALLENGES INDIA FACES IN ATTRACTING MORE JAPANESE INVESTMENT

Japan's improved appreciation of the merits of the Indian market, cannot however mask the reality that whilst potential exists, obstacles for Japanese corporations in India are also diversifying. Until recently, the top three problems for Japanese corporate investment in India centered on undeveloped infrastructure, bureaucratic red tape and labor problems. In response, the Japanese government repeatedly requested improvements from the Indian government with little success. Additional problems have now surfaced in the form of intense competition from South Korean companies and land acquisition disputes. The acquisition of industrial land has proven particularly troublesome to Japanese corporations. Many hastily forayed to the vicinity of Delhi and Gurgaon where securing space for new industrial parks is highly problematic, encouraging Japanese corporations to use local corporations as dummies to prevent a sudden jump in land prices. India remains a seller's market with negotiating power firmly in the hand of the supplier. Reports have even surfaced that whilst land might be available; owners refuse to disclose their status, thereby making it impossible for corporations to make a bid. Overall, Japan's trading houses have thus far been hesitant to set up industrial parks or Special Economic Zones (SEZs) in India.

An important factor affecting Indo-Japan trade is the tariff and non- tariff barriers imposed by both countries. Japan has placed import prohibitions and quantitative restrictions on imports from India, for example, on fish and silk items. Japan's Sanitary and Phytosanitary Measures (SPS) are major barriers to Indian exports of poultry, meat, shrimps and fruits like mangoes and grapes. This issue highlights the need for sharing and facilitating the exchange of technology under the agreement to promote Indian exports to Japan. Similarly, Japanese exports to India also face high tariffs that act as a major impediment to exports from Japan. Therefore, analyzing the tariff and non-tariff barriers to trade in both the countries would be mutually beneficial to enhance trade relations.

FUTURE PROSPECTS OF INDIA-JAPAN ECONOMIC RELATIONSHIP

Japan is looking to boost trade and investment ties with India. The reasons behind this interest in India are obvious. India offers a large domestic market base. Besides, mutual synergies between businesses in the two countries are driving initiatives-

i)   Japan's ageing population (23% above 65 years) and India's youthful dynamism (over 50% below 25 years)

ii) Japan is a relatively labour scarce, capital abundant country that complements India's rich spectrum of human capital

iii) India's prowess in the software sector lends synergy to Japan's excellence in the hardware sector

iv) India's abundance of raw materials and minerals matches well with Japan's capabilities in technology and capital to produce knowledge-intensive manufactured goods

v)   India's large domestic market has been the main factor for investments by Japanese companies. The majority of investments are in traditional fields like machinery, automobiles and auto parts

vi) Japanese small and medium enterprises have begun to discover India as the new growth market. Japan and India share a common vision for the world. This is aptly illustrated by the fact that there has been an increase in the number of joint declarations, delegation visits and other business events between the two countries.

CONCLUSION

Japan's long reluctance to invest in India appears to have ended and in recent years Japanese FDI flows to India have increased substantially. Along with this, India's imports from Japan have also improved recently. However, India's exports to Japan have continued to languish and have fallen below 2 per cent of India's global exports. There has been virtually no outward FDI from India into Japan. The CEPA between India and Japan which came into effect from August 2011 is expected to improve the trade between the two countries and reverse the slide in India's exports to Japan. India's investment into Japan also is expected take off in the coming years in areas of IT, pharmaceuticals and biotechnology.

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ROLE OF REGIONAL RURAL BANKS IN INDIA'S NEW DIFFERENTIATED BANKING DESIGN: COMPETITION FROM THE NEW ENTRANT SMALL FINANCE, MUDRA AND PAYMENT BANKS

ABSTRACT

The achievements of Regional Rural Banks (RRBs) in terms of rural outreach and financial inclusion, especially as compared to other financing agencies, are impressive and significant for rural India for many reasons. However, performance of RRBs have not been very impressive on income and profitability parameters compared to other commercial banks. Despite the dismal performance, their role and importance in rural areas are enormous in the existing credit delivery systems. This paper examines the various aspect of RRBs such as number of banks and branches, deposits and its ownership, loans and advances, investments, purpose-wise direct advances, in India since its inception. The increased credit growth rate of RRBs indicates a thrust of agriculture lending initiatives by Government after 2004 onwards however, from last couple of year's substantial increase in lending to non-form sector indicates significant shift in business in rural areas. The study indicates a shift in the strategy of RRBs from giving loans and advances to keeping funds safely in investment in government securities. The study further highlights the Challenges that RRBs may face in future from the new entrant small finance banks, MUDRA and payments banks which will be occupying the same banking space of RRBs for business.

Keywords: Priority sector, Rural Credit, NABARD, Institutions. JEL Classification: E21, E44, G11

INTRODUCTION

Rural development occupies a significant place in the overall economic development of the country. Institutional finance is an important pre-requisite for rural development of the country. Since independence, it has been constant endeavour of our policy makers to give adequate thrust to rural development as the sector is directly related to agriculture and touching more than half of the population of the country. In the existing credit delivery system, there are four channels for institutional credit in rural areas, viz., (i) Commercial Banks (ii) Regional Rural Banks (RRBs) (iii) Short term co-operative credit institutions namely Primary Agricultural Credit Societies (PACS) and their apex body at the district level namely District Central Co-operative Banks and at State level State Co-operative Banks (SCBs) and (iv) Long term co-operative credit organizations. Amongst all these credit institutions, RRBs are considered to be the prominent one due to its special features.

Nationalization of commercial banks in 1969 failed to penetrate the development in rural areas to the extent desired. The benefits of the institutional credit continued to be cornered by the economically and politically powerful sections of the society; hence the need was felt for establishing financial institutions specialized to cater to the needs of the rural poor. In

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order to fill-up the regional and functional gap in rural areas and to ensure sufficient institutional credit for agriculture and other rural sectors, RRBs were established under the provisions of an ordinance promulgated on the 26th September 1975 and the RRBs Act, 1976. The RRBs mobilize financial resources from rural/semi-urban areas and grant loans and advances mostly to small and marginal farmers, agricultural laborers and rural artisans. RRBs are jointly owned by the Government of India (GoI), the concerned State Government and Sponsor Banks. The issued capital of a RRB is shared by the owners in the ratio 50:15:35 respectively.

The RRBs were established with an objective of a low cost financial intermediation structure in the rural area to ensure sufficient flow of institutional credit to agriculture and other rural sectors. RRBs were expected to have local feel and familiarities of the cooperative banks with the managerial expertise of the commercial banks. These banks are required to undertake:

(i)   Granting of loans and advances to small and marginal farmers, agricultural labourers, co-operative societies, agricultural processing societies, primary agricultural credit or farmers societies for agricultural purposes or agricultural operations or for other purposes; and

(ii) Granting of loans and advances to artisans, small entrepreneurs and person of small means engaged in trade and commerce or industries or other productive activities, within its area of operation[1] .

Though RRB is a commercial bank, it also incorporates the good quality of co-operative element. RRB differs from commercial bank in such a way that their area of operation is limited to a particular region comprising one or more districts in any state. The study is important in the sense that less importance has been paid to RRBs by researchers as it contributes only 3 per cent of banking system and also due to paucity of data related to it. In the present study time series data of sectoral credit have been used. Hence, we believe that this will invigorate further analysis in the area of structural shift in RRB's lending. Important finding of the study can be summarized as followings:

In addition to this introductory section, the paper is divided into five sections. Section II discusses the review of literature. Section III focuses objective of the study. Section IV is devoted to data and methodology. Section V concludes the paper outlining challenges faced by RRBs with new players. Concluding observations are set out in Section VI.

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[1]The Regional Rural Bank Ordinance Reserve Bank of India Bulletin, Bombay, January 1975.

LITERATURE REVIEW

The literature available on the working and performance of RRBs in India is limited. The literatures obtained by investigators in the form of reports of various committees, commissions and working groups established by the Union Government, NABARD and RBI, the research studies are briefly reviewed in this subsection.

Kumar (1993) carried out a study on the topic "Growth and Performance of RRBs in Haryana". A study of business performance of RRBs in Haryana reveals that there is enormous increase in deposits and outstanding advances. The researcher felt the need to increase the share capital of RRBs and efficient use of distribution channels of finance to beneficiaries. Prakash (1996) conducted a study with the objective of analyzing the role of RRBs in economic development which revealed that RRBs have been playing a vital role in the field of rural development. Moreover, RRBs were more efficient in disbursal of loans to the rural borrowers as compared to the commercial banks. Support from the State Governments, local participation, proper supervision of loans and opening urban branches were some of the steps recommended to make RRBs further efficient. According to Swami, Nathan (2002), policies of current phase of financial liberalization have had an immediate, direct and dramatic effect on rural credit. There has been a contraction in rural banking in general and in priority sector lending and preferential lending to the poor in particular. Chavan (2004) examined the growth and regional distribution of rural banking over the period 1975-2002. Chavan's paper documents the gains made by historically underprivileged regions of east, north east and central part of India during the period of social and development banking. These gains were reversed in the 1990s: cutbacks in rural branches in rural credit deposits ratios were the steepest in the eastern and northeastern states of India. The study concluded that policies of financial liberalization worsened regional inequalities in rural banking in India. Reddy and Prasad (2011) in an evaluative study observed that these banks penetrate every corner of the country and have extending a helping hand in the growth of the economy.

Since the inception, the RRBs made impressive strides on various business indicators and fulfill the objective for that they have created. However, RRBs suffered losses till 1996-97 due to their dismal performance on banking parameters as compared to commercial banks. In response to their dismal performance GoI and NABARD, however, taken many corrective measures in terms of operations and regulations to improve their business performance by way of amalgamation, capitalization, flexibility in investments, relaxation in lending to non-target groups, technological up gradation etc. to accelerate their business and profitability. All these steps helped to restore the fortunes of RRBs at some extant however, since RRBs serve scattered and less profitable clientele with low ticket sizes of loans under stringent priority sector lending norms and other delivery constraints their performance could not be improved up to mark as desired. The questions remains critical for RRBs for their existence in the current banking landscape.

At present Indian banking industry is going through the process of consolidation/merger in contrast granting license of small finance banks, MUDRA and payment banks creating a banking paradox. The current debate is about the existence of RRBs especially after advent of new players. Do any re-positioning of RRBs is required in the financial architecture? Does emergence of new players in their area of operations will effect RRBs business? Are RRBs to scale-up through privatization or merged with the sponsor banks? How is that going to affect their ability to serve their original mandate? RRBs are still being directed to the lower profitability business/remote areas by the sponsor banks, then how is the viability issue to

be resolved? How can they meet the same profitability standards as other scheduled banks? Is an alternative social accounting frame to be adopted for RRBs in view of their special charter and area of operations?

OBJECTIVES OF THE STUDY

Regional Rural Banks (RRBs) are scheduled commercial banks (Government banks) operating at regional level in different States of India. They have been created with a intention to   serve primarily the rural areas of India with basic banking and financial services. The emergence of small finance banks, MUDRA and other payment banks are creating a banking paradox and affected the RRB to a great extent. In light of this, present study has taken up with the following objectives:

(i) To study the growth-pattern of RRBs in India and assess the trends in lending in rural areas

(ii) To analyse whether RRBs are able to fulfill their purpose for that they have created.

(iii) To examine the challenges pose by small finance banks and payments banks and suggest some corrective measures so that RRBs can be made more potential in future.

DATA AND METHODOLOGY

The present study is diagnostic and exploratory in nature and makes use of relevant data collected mainly through the Databases on Indian Economy, RBI, and National Bank for Agricultural and Rural Development (NABARD). The journals viz., the Indian Banker, Journal of Indian Institute of Banking and Finance and other banking journals have also been referred. The study is confined to specific areas like branch expansion, Credit-Deposit ratio (C-D ratio), loans and advances, deposit and credit mobilization, purpose-wise classification of direct advances and investment of RRBs starting from 1975-2016. Sector-wise time series data on lending has been made first time in this paper since inception of RRBs.

GROWTH OF RRBS IN INDIA

The principle objective of establishment of RRBs is to "make available institutional credit to the weaker section of society who had by far little or no access to cheaper loan and had been dependent on the private money lenders[2]. It is with this spirit RRBs have come to provide low cost credit, generate employment opportunities and thereby to raise standard of living of rural masses. RRBs have taken banking service to the door step of rural masses particularly in non- banking areas. The Government of India initiated a process of structural consolidation of RRBs by amalgamating RRBs sponsored by the same bank within a State, with a view to provide better customer service by having better infrastructure, computerization, experienced work force, common publicity and marketing efforts etc. The amalgamated RRBs also benefitted from larger area of operation, enhanced credit exposure limits, high value advances and diverse banking activities. As a result of the amalgamation, the number of RRBs has been reduced from 196 to 56 as on 31 March 2016 with 20768 branches covering 642 districts which deals with 120 million customers of rural and semi urban areas. During the last four decades, RRBs provided banking services to the

[2]Government of India Report on Working Group of RRBs, New Delhi, Government of India.

rural masses and extended wide variety of financial assistance to the weaker and poorer sections of rural society. The progress of RRBs under branch expansion, deposits, advances & CD Ratio are depicted in Table 1.

BRANCH EXPANSION OF RRBS

RRBs started functioning from October 1975, with 5 RRBs and 13 branches covering 11 districts in four different states. A phenomenal growth was witnessed in the first year of establishment of RRBs itself. By the end of 1976, there were 40 RRBs spread over 84 districts of the country with a network of 489 branches. The progress in the setting up of new RRBs was very slow in 1976 that 20 new RRBs could only be established in three year period till end of 1979. It may be due to some uncertainty about the future of RRBs. Accordingly, on June 23, 1977, the RBI appointed a Committee to review the working of RRBs under the Chairmanship of Professor M.L. Dantwala which opined that "the RRBs have demonstrated their capability to serve the purpose for which they were established. They have established their image as a new type of institution catering to the credit needs of a class of borrowers to whom institutional credit was hitherto not available. The Committee was therefore definitely against the idea of scrapping the RRBs structure"[3] . Further, it suggested the RRBs should become an integral part of the rural credit structure. Rapid growth in the rural banks and their branches has been observed during 1980-85. During this period, 128 new RRBs were setup and additional 10186 branches were opened. This was the peak period in the history of RRBs in terms of coverage. In 1993, RBI gave permission to RRBs to relocate branches that were consistently making losses for more than three years. This policy provided an opportunity to the RRBs to shift branch premises to more commercially promising areas from localities where they had incurred sustained losses. In December, 2005, RRBs were permitted to set up off site ATMs in their area of operations without prior approval of RBI. In November, 2010, RRBs were allowed to open branches in Tier 3 to Tier 6 Centres without prior authorization from RBI, subject to reporting to the respective Regional Office of RBI and fulfilment of certain conditions. The policy was further liberalized in August 2012 to also cover Tier 2 centres. The rural orientation of RRBs may be inferred from the fact that more than 74 per cent of their branches are located in rural areas and almost 20 per cent of their branches are located in semi-urban areas.

MOBILIZATION OF DEPOSITS

Mobilization of deposits is one of the major functions of RRBs which depends upon the saving capacity, saving habit of the people and the area in which the bank is operating. It also depends on the potential of the area concerned. RRBs have achieved steady growth in aggregate, per bank and per branch deposits (Table 1). The average deposits growth from 1975-76 to 1988-89 was 37.0 percent followed by 20.9 percent recorded during the period 1990-91 to 2004-05 (pre amalgamation). Post amalgamation period (2004-05 to 2015-16), deposits growth slackened to 15.4 percent. It is also observed that till pre amalgamation period, deposits growth in RRBs in percentage terms was comparatively higher than Scheduled Commercial Banks (SCBs). However, post amalgamation period, the percentage growth was almost same with SCBs. Both deposits and credit grew by 20 percent during 2000-01. However, the credit growth rate was more pronounced than deposits growth rate thereafter (Chart I). Ownership pattern of deposits of RRBs shows that

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[3]RBI (1978) Report of the Review Committee on RRBs, p.74.

more than 90 percent of deposits are mobilized from household sector (Table 2). Deposits growth rate has slackened from 2008-09 due to high inflation and investment in gold by house hold sector. The trend indicates a faster rate of growth in rural deposits than rural loans till 2001 and reversed thereafter. For improving the CASA deposits of RRBs, Government of India issued necessary instructions to all State Governments in 2014 for keeping their funds with RRBs. Active participation of RRBs in Pradhan Mantri Jan Dhan Yojna, the flagship programme launched by the Government of India in August 2015, has enabled them to mop up sizeable deposits from households in unbanked areas.

Chart 1:Deposit and Credit Growth Rate in percent
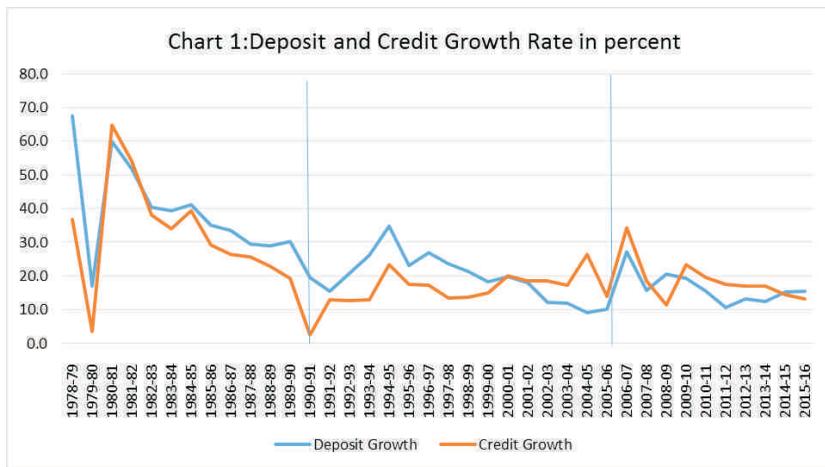
CREDIT-DEPOSIT RATIO

Advances play pivotal role in the business plan of RRBs. RRBs are focusing on taking banking activities to last mile. They devote special attention on the weaker sections and target groups to uplift them and share the benefits of rural development. The advances of RRBs are predominantly short term crop loans and medium term loans for agriculture and allied activities sanctioned to the weaker sections.

Chart II: Credit-Deposit Ratio
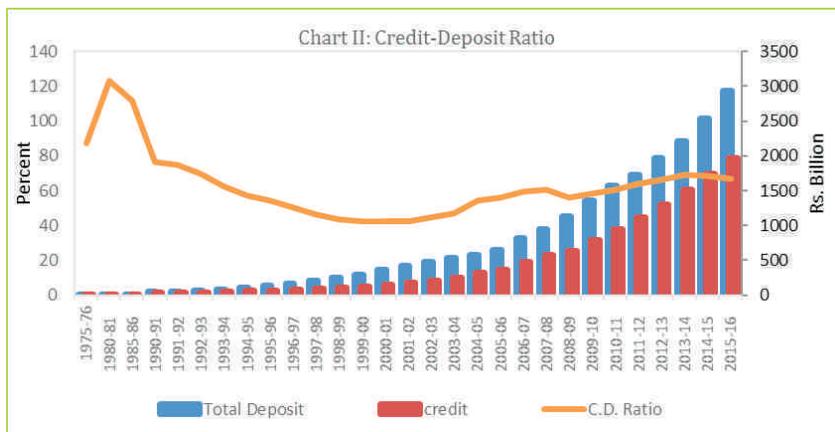
It is observed that CD Ratio has increased since inception of RRBs and peaked to 120 percent during 1980-81. Thereafter, it has shown a declining trend and reached a level of 50 percent during 2001-02. However, post amalgamation, the ratio started improving and stood at 67 percent during 2015-16. C-D ratio amongst RRBs, however, has wide variation due to geographical factors. The reason for high C-D ratio till 1990 was due to the fact that RRB's were permitted to lend only under priority sector schemes and they had very limited scope to invest their surplus funds freely.

PURPOSE-WISE DISTRIBUTION OF DIRECT ADVANCES

The direct advances of RRBs constitute short-term (crop loan), investment and allied activities, loans to rural artisans/village cottage industries, retail trade business/self-employment, consumption and other purposes. The purpose-wise break-up of loans and advances by RRBs for various years indicates that crop loans and term loans constitutes a major part of the direct advances of RRBs. However, there is an inter shift between shares of crop loans and agriculture and allied activities. The analysis of direct advances further reveals changing trend in the advance pattern.

Chart 3: Share of Sector-wise Lending
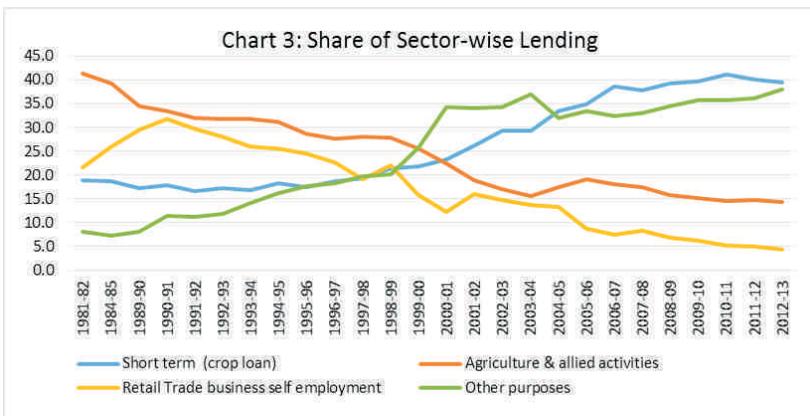
It may be observed from the table that during 1981-82, 60 per cent of the total advances were given to farm sector and 26.92 per cent to rural artisans and retail trade business and self-employment. In 2013, 53.83 per cent of total advances were towards farm sector, a decrease of 6.17 percent. During the same year, non-farm sector i.e. rural artisans and retail business accounted for 5.23 per cent of total advances, which was 26.92 percent of total advances in 1981-82. The term loans sanctioned gave opportunity to rural poor to create income generating assets. Coupled this, RRBs should provide funds for working capital and crop loan on a need basis to borrowers to enable them to use the assets effectively and efficiently. Hence, the decrease in advances to farm sector is a matter of concern.

The consumption loans increased to 3.01 percent of total advances in 2013, from 1.21 percent in 2001. The proportion of loans for other purposes also gained momentum during the period covered under study, to 37.94 per cent of total advances in 2013 from 8.13 per cent of total advances in 1981-82. This shows the significant shift in business in rural areas during the recent period. The contribution of indirect advances to total advances is almost negligible.

PRIORITY SECTOR LENDING AND INVESTMENTS

The definition of priority sector has evolved over a period of time and at present, priority sector is broadly taken as those sector of the economy, which in the absence of inclusion in the priority sector category, would not get timely and adequate finance. Typically, these are small loans to small and marginal farmers for agriculture and allied activities, loans to micro and small enterprises, loans for small housing projects, education loans and other small loans to people with low income levels. Before the initiation of banking reforms, lending by RRBs was largely restricted to the priority sector. From September, 1992 onwards, RRBs were allowed to finance non-target groups to the extent not exceeding 40 percent of their incremental lending. This limit was subsequently enhanced to 60 percent in 1994. As a result, the RRBs diversified into a range of non-priority sector (NPS) advances, including jewel and deposit-linked loans, consumer loans and home loans. According to RBI guidelines, with effect from January 1, 2016, priority sector target for RRBs has been revised to 75 percent of total lending. Also, sub targets under agriculture, small and marginal farmers within agriculture, micro enterprises and weaker sections were set by RBI. As per revised guidelines new sector like renewable energy, medium enterprises, agro-processing and social infrastructure have been included. This kinds of revision and structure gives the flexibility to each of the banks to identify the area of strength and put maximum effort to generate surplus and trade that in the priority sector lending certificates (PSLC) market while by certificates in areas where other have generated surplus (S.S Mundra, 2017). However, some questions also being raised by experts that the said increase will adversely affected the RRBs in financial terms, as the loose the flexibility of earning additional income by selling their PSA in excess of 60 percent by way of Inter-Bank Participation Certificates (IBPCs). Also, enhancement of Priority Sector target to higher level, has trimmed down their major bucket (i.e. IBPCs) available for earning non-interest income.

RRBs are allowed to make investment portfolio with the view that they would improve their income and profit. There is a marked shift in strategy of deployment of funds by RRBs as they prefer to invest in shares, bonds and Government Securities safely, rather than lending to agriculture and other sectors. Data indicates that RRBs are maintaining high investment portfolio from 2002-03 onwards (Chart 3). The high investments may generate some profit for them but it is distancing the RRBs from rural poor.

Chart III: Share of Credit and Investments (as percent of Aggregate Deposits)
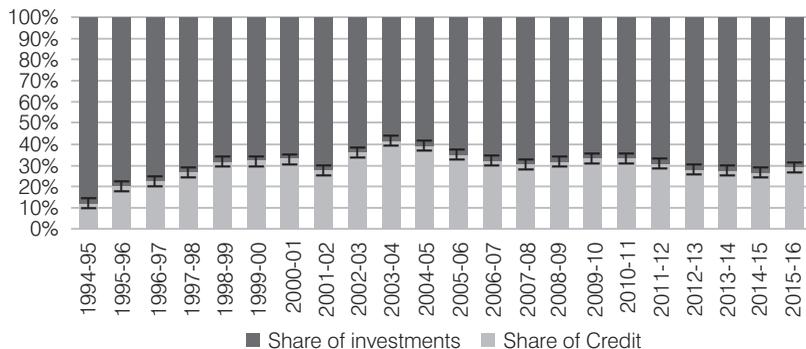
RRBS OPERATIONAL, FUNCTIONAL AND POLICY IMPERATIVES

(i)   Capital base is the key for making credit expansion, technological upgradation and adoption of new technology. For strengthening the RRBs in terms of regulatory requirement RRBs need to have a CRAR of at least 9 percent on a sustainable basis. GoI has initiated various steps in the past years to make the RRBs sustainable. One of the important measures in this line is the changes enabled in holding pattern of RRBs through amendment brought in the RRB Act 1976, which came to force w.e.f. the 4th February, 2016. The amendment has raised the authorized capital of RRBs from Rupees 50 million to Rupees 2 billion and provides for reduction of combined shareholding of Central Government and Sponsor Bank to 51 percent. This enabled RRBs to raise capital from market other than the existing stakeholders. However, it will not be easy for RRBs to raise capital from open market as return on equity for banks is between 6-8 percent and hence, it is not profitable for banks to approach the markets for capital with such low returns. In order to give effect to the amendments, it is necessary that a standard policy need to be put in place for raising of capital from market by RRBs.

(ii)   To improve the productivity and profitability, RRBs are required to become slim and outsource non-core functions such as IT maintenance, cash remittance and house-keeping. It is required to handle higher volume of business with a lesser number of employees in a core-banking environment backed by modern IT infrastructure (recommendations of SK Mitra committee on HR policy for RRBs).

(iii)   The Payment and Settlement Systems (Amendment) Bill 2014 helped RRBs to address the problem of insolvency in the payment and settlement system by increasing transparency and stability and bring India's banking payment system in sync with international practices. All RRBs have onboard to NPCI platform, they have implemented a host of IT initiatives like NEFT, RTGS, RuPay ATM Debit and Kisan Cards, Mobile Banking, E-Commerce, Aadhar Enabled Payment System (AEPS), Micro ATM etc., at the instance of GoI/RBI, which will result in more digitalized and cashless transactions.

(iv)   Various efforts and measures have been taken to improve the efficiency of RRBs from time to time however, the issue relate to capital, area of operations, human resources, nonperforming assets, governance, autonomy and multiple control are still a major constrain for RRBs which is need to be addressed properly.

(v)   RRBs are still being directed to the lower profitability business/remote areas Compare to SCBs. RRBs cannot meet the same profitability standards as other SCBs. Viability is still the major concerned for them. The architects of the RRBs had initially forecasted that they would incur some losses, which should be treated as essential social cost for the social benefit of covering the rural poor.

COMPETITION FACED BY RRBS ON ADVENT OF SMALL FINANCE BANKS, MUDRA AND PAYMENTS BANKS

The Nachiket Mor committee (2013) opined that in the Indian context, it would be important to have the regulatory flexibility to approach payments, savings, and credit independently (the Vertically Differentiated Banking Design) and to bring them together when the efficiency gains are high and the other costs are low. Differentiated banks are distinct from universal banks as they function in a niche segment. The differentiation could be on

account of capital requirement, scope of activities or area of operations. On the other hand, calling for an inclusive banking structure for India by 2019, Mahajan (2013) has suggested three criteria to judge the success of a banking system i.e. of contributing to (i) inclusion (ii) growth and (iii) stability. He proposed six levels of banking namely - (i) community (ii) region (iii) state (iv) zonal (v) country and (vi) international banking, for which six types of banks would be required.

To tap the unmet potential demand for financial services, two types of new entities viz. Small finance and payments banks have been created stipulating target segments where the financial services should be directed to ensure the target segment is serviced. The licences have been granted for the 11 payments banks 10 small finance banks out of which 4 payments and 8 small finance banks are functioning. It appears that both the proposals for differentiated banking and universal banking. A question arises how the activities of these entities with overlapping functions and clientele as RRBs would impact on their relevance and viability. Since licences have been given to big corporates who have huge capital base and come with state of art technology and occupy the same banking space of RRBs and hence pose serious challenges to them. However, many observers believed that not much impact likely on the existing banks of the presence of the new players especially as there is vast unmet demand and unserved marked for medium, small-scale and micro loans.

Small Finance and Payment Banks are differentiated banks that will undertake only certain restricted banking functions that the Banking Regulation Act of 1949 allows. Conceptually, payments banks in terms of their design and strengths may be able to capture some of the remittances business through various partnership models. However, the core savings and credit and increasingly the insurance business may continue in the hands of the older players. As far as small finance banks are concerned, interestingly they too are poised to be focused away from the clients requiring micro-products which the RRBs too are alleged to have abandoned. As such, there seems to be potential surge in the availability of financial services to medium scale enterprises and middle income groups which too have probably not received their fair quantum of services over the years. The definition of microfinance having being further enlarged to include transactions up to Rupees 0.1 million could mean that such services too could become mainly available to the more bankable entrepreneurial section of the not-so-poor. This may not be of much comfort to the truly excluded families at the "bottom of the pyramid."

Small and payments banks are not a threat or client overlap with RRBs as these banks had been a working with rural clients for a long and operated even in the presence of private banks. Since lending portfolio is largely taken care by RRBs. Savings and pension/insurance schemes would be routed through RRBs. RRBs will continue to play a strong role in financial inclusion with all the new accounts that have been opened and with insurance schemes and pension schemes under (Pradhan Mantri Jan-Dhan Yojana & Pradhan Mantri Fasal Bima Yojana) all being routed though the banking sector. Payment banks are only supposed to collect deposits, not give any loans. Even the job of the payment banks will also be tougher, in terms of making a huge dent in the deposit market when the mutual funds and other players are already on high rise in recent years. Thus the role of RRBs will not be diluted, though there may little more competitor in that particular space.

Even MUDRA "Bank" as a source of refinance for its operations too covers the space by proposing to provide funds for on-lending to the microenterprise segment. It seeks to

provide refinance to commercial banks, RRBs, small finance banks, cooperative banks and NBFC-MFIs for three types of products for on lending to entrepreneurs.

As part of the new financial inclusion campaign the government will need to substantially strengthen and integrate the institutional architecture, announce breakthrough policies, learn from efficient private sector experiences, and fully leverage technology solutions. Leaving it to the banking infrastructure alone may not yield results. Digitizing the financial inclusion space and bringing in more players to facilitate ease of transactions needs to be encouraged. While small finance banks will help in credit outreach, payments banks will help fill gaps in access to formal payments and remittances system. Business Correspondents will need to be made more viable and strong emphasis on financial literacy is required before the new financial inclusion clients recognize the need and significance of banking.

In terms of challenges, RRBs are likely to feel the impact on their market share in deposits (particularly CASA) and secured advances. Pricing ability may also come under pressure, both on assets and liability products. General erosion in business, attrition of Business Correspondents (BCs) and migration of clientele may be expected. Since major telecom player coming into the payment space, and because of their reach, they can collect deposits also the dominance of the banking structure in the payment system is also expected to reduce. However, this will depend upon increasing customer expectation, fillip provided by technological advancements and the sea change in delivery procedures. RRBs need to keep a close watch on evolution of these institutions, their products, processes, delivery models and reach. RRBs enjoy strong brand perception in their area. However, they should have to figure out how to become agile and strengthened in the area of their technology based products and services. Also, Board of RRBs needs to be strengthened and professionalized. All these may facilitate the RRBs to face the competition from the new comers and to defend their turf.

On profitability parameters, RRBs are directed to the lower profitable due to high cost-income ratio and non-performing assets as compare to PSBs. Profitable operations are extremely difficult due to the small ticket size of the financial products, the scattered clientele and relatively large human resource burden. Therefore, RRBs cannot meet the same profitability standards as other scheduled banks. The viability issue of RRB need to be resolved in terms of social cost for achieving the social benefit in view of developing the rural economy for the benefit of the poor in India. An alternative social accounting frame to be adopted for RRBs in view of their special charter and area of operations.

CONCLUSION

To conclude, the achievements of RRBs in terms of rural outreach and financial inclusion, especially as compared to other financing agencies, are impressive and significant for rural India for many reasons. However, they have not fully utilized their potential, especially in the area of credit disbursement. The substantial increase in lending to non-farm sector indicates significant shift in business in rural areas. Decrease in advances to farm sector is a concern and need to be reviewed and corrected. The Investment-Deposits Ratio of RRBs at present is around 27 percent to 40 percent of aggregate deposit, which is high and they should endeavour to increase their advances portfolio on an ongoing basis.

The RRBs are faced with a host of problems viz., lack of proper digital business model, the issue of capital, area of operations, human resources, nonperforming assets, governance,

autonomy and multiple control are still a major constrain for RRBs. There is a need for greater autonomy for RRBs in operational matters and many committees in the past have made recommendations on this issue. RRBs are diverse in size as well as in area of operation. Their notified area varies from 2 districts to 26 districts. There are 11 RRBs which cover less than 5 districts and 4 of these RRBs have operations in only 2 districts. These districts though are of different sizes in terms of area and population and they have branches ranging from 10 to 170. There are 25 RRBs with up to 20 districts and 9 RRBs with over 20 districts as their area of operations. Small Finance banks and Payments Banks have a pan India presence. Single State-level RRB in the State as recommended by Vyas Committee may be considered.

Finally, especially the advent of more players in the space for providing financial services to small and medium enterprises, it is an opportune moment for the RRBs to re-examine the place of the poorest segment in their operations and lending portfolio. The thrust of new financial inclusion by Government through digital payments, offer of new financial services with partnerships with MFIs and other agents, provision of wholesale funding to MFIs could be a gaining options for RRBs.

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PURCHASE BEHAVIOR OF COLLEGE STUDENTS: ANALYSIS OF ONLINE RETAIL PURCHASES

ABSTRACT

It has often been discussed in research, how the growth of online retail in India can be boosted. Amongst all the factors considered and discussed, the gap in research continues to remain as to discuss the role of pre-purchase intentions and post purchase intentions in online retail in India. To understand this, it is required to first identify both the intentions. In this study, the pre-purchase intentions are identified under theory of perceived risk, covering perceived risk, product risk, privacy risk, convenience risk, subjective risk, perceived behavior risk. The post purchase intentions are identified under service and infrastructure risks. Questionnaire containing related questions were filled in by students aged 18-25 years old in Delhi region through online survey. The data was bifurcated according to frequent and less frequent online buyers, the pre-purchase intentions are studied through former, while post-purchase intentions are studied through later. Principal component analysis and reliability test were used to predict which factors majorly contributed to apprehensions of frequent buyers and less frequent buyers individually. Multiple regression analysis was then conducted and the significance was checked. It was found that for less frequent buyers- card charges, buying goods without physical examination, complexity in buying process and comparison with offline retail prices significantly affected their purchase behavior. Whereas, for frequent buyers, post purchase intentions such as delivery charges, delivery time, return policy and warranty of the product significantly affected their online purchase behavior.

KEYWORDS: online retail, pre purchase intentions, post purchase intentions, college students, PCA, multiple regression

INTRODUCTION

Today, most entrepreneurs are doing business online which has made life much easier. The online retailing is becoming an integral part of almost every economy. E-commerce is enjoying several advantages by making it comfortable for the users to buy inline. Online customers look for new products, attractiveness and price compatibility. They use internet for price comparisons, search information about a product, comparison of price across brands, buying options beyond physical boundaries etc. which means they don't have limits to shop online. The online shopping depends upon factors like shopping incentive, shopping motive, internet knowledge and so on. Online shoppers want to gain maximum information with minimum clicks and reach information which suits their requirement such as best brands and best price and offers. By using E-Commerce, the dealers of the products can save on the selling expenses and help in inventory management. Transaction

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cost in between producers to ultimate consumers will reduce which can be used for expanding their business. Mode of payment is also made very convenient by many online companies where the consumer need not use his/her debit or credit card due to the lack of trust and security. In such cases companies are allowing Cash-On -Delivery (COD) option and deliver the products at their doorstep. Consumer Behavior is the study of how individuals or groups select a product or service that satisfy their needs. In economic theory, consumer behavior is determined by maximization of their utility. Many theories exist which show how consumer achieves equilibrium. In this era, with a huge wave of internet and other gadgets, consumer's modus operandi of purchasing have changed a lot. The behavior of customers is different in both, online purchase and physical purchase. In modern world the popularity of internet is increasing rapidly.

In India, a liberal economic policy has helped the country improve on globalization front. India has been gaining importance as a high potential lucrative market for global retailers. In 2009, Indian retail market size was ranked as the 5th largest globally, and was valued at US $ 400 billion. A recent industry report by global consultancy Northbridge Capital stated the growth of India's retail industry to be US$700 billion in 2010. The per capita income in India has gone up (Hubacek et al., 2007) as much as 14.2% in 2006-07 after the recent economic reform, resulting in an increasing number of Indian consumers with an affordability to use Internet service (at home, cyber cafes, or on a phone, etc) (www.tradechakra.com, 2008). This supports industry statistics by Internet and Mobile Association of India (IAMAI), showing 30% growth (2.15 billion USD) of e-commerce and mobile industry in 2008 alone. It would be interesting to analyze Indian consumer's attitude towards online retail, especially to understand how to improve the online retail in India.

In spite of a number of evidences showing the growth of Internet usage by Indian consumers, internet sales show less than 1 percent of the total retail sales in India. This may represent the untapped potential of Indian online retail, which yet need to overcome certain obstacles. Many Indian consumers have low self-efficacy in using Internet and feel shopping online to be unconventional. It seems that even for those, who use Internet on regular bases, Internet is mainly for searching product information, comparing prices, and/or checking consumer reviews rather than making a purchase. Many studies frequently mention that there is a vast amount of window shopping taking place online but the number or the rate of surfers who turn into purchasers or regular buyers are very low. This might happen because of the lack of consumer intention to purchase an offering from the online environment at the outset. It might also happen because of various problems that arise during online shopping driving the consumer to abandon the task in the middle. Therefore, while one stream of research should identify the reasons behind the purchase

reluctance of consumers, another area of concentration should be why people abandon their shopping carts and stop the purchasing process in the middle. Such attempts can help to understand how to turn surfers into interactors, purchasers, and finally, repeat purchases by making them enter into continuous interaction with this environment (Sheth et al, 2006)

In this study, the focus is on the pre-purchase and post-purchase intentions of the consumers buying online. It is important to know their perception toward online shopping and their classifications of online browsers or online shopper. In addition, the factors preventing them from shopping online are important to understand. Important factors affecting the consumer's decision to buy online are chalked out, both before the purchase is made and after the purchase is made. With this, the whole domain of apprehensions can be understood and respective measures to improve online retail can be made. This study analyzes the purchase intentions of young buyer, college students, between age of 18-25 years. This information will help Internet retailers find the way to encourage Indian shopper's online purchase behavior and help motivate and encourage more people to shop online.

LITERATURE REVIEW

In this section, we will review the literature which have studied online purchase behavior of the consumer. The typical Internet user of the twentieth century is young, professional, and affluent with higher levels of income and higher education. They value time more than money which automatically makes the working population and dual-income or single-parent households with time constraints better candidates to be targeted by non-store retailers. (Chary et al 2003)

PRE-PURCHASE INTENTIONS

Identifying pre-purchase intentions of consumers is the key to understand why they ultimately do or do not shop from the Web Market. Ajzen (1991) suggested that intentions are presumed to be an indicator of to what extent people willing to approach certain behavior and how many attempts they are trying in order to perform certain behavior. According to the studies by He et al. (2008), lack of intention to purchase online is the main obstacle in the development of electronic commerce. The theory of planned behavior (TPB) applied on Thai consumers implied that the intention to shop online was most likely to be affected by perceived behavioral control and subjective norm, the sum of the attitudes from the people surrounding them (Orapin, 2009). Since these two factors can influence consumers' purchase intention , thus influencing their behavior towards online shopping and eventually lead to actual action (Orapin, 2009).

The high effect of purchase intention towards online shopping behavior was consistent with previous studies (He et al., 2009; Orapin, 2009; Pavlou ,2006; Roca et al., 2009) that the intention was a salient predictor of actual behavior to shop online. The second higher was between subjective norm and purchase intention with positive and significant result. The result implied that university students' purchase intention was influenced by perception of the families, friends and media.

Theories and studies have been put forth to determine that what causes a customer to shop online. Hausman et al (2009) highlighted the importance of a good web interface for websites to increase the base of customers. Verhagen et al (2009) identified factors like online store service, online store merchandise, online store atmosphere and online store

navigation as important contributors of online purchase intentions. Similarly, Chiu, Lin, and Tang (2005) highlighted the importance of personal awareness of security, perceived ease of purchasing, perceived usefulness, personal innovativeness and attitude towards buying in the formation of intentions for online purchase. Bosnjak et al (2007) argued that online purchase intentions are a function of the personality of a customer, focusing more on the intrinsic factors. Many studies differ from each other in determining the key dimensions of online purchase intentions. Zhou (2011) highlighted the role of social influence in the virtual world. According to him, a person's judgement to buy a product is often strongly affected by people who are close, rather than strangers. People interact with other persons to seek advice and get information. According to Kim et al (2007) social influence is one of the key drivers of the online purchases. The social influence is the referent power of people in the decision-making process of an individual. In the virtual world where online shopping takes places, the social influence can be exerted by family, peers and groups, both offline (physical) as well as online in the form of e-WOM. Pookulangara et al (2011) determined that cultural and social influences are the major contributors of online purchase intentions. Sinha et al(2001) also argued that customers are far more likely to believe commendations from people they know and trust, i.e., friends and family members, rather than from automated recommender systems in e-commerce websites.

Brand image or symbols and names associated with a brand play a role as to how customers perceive products or service of a brand. Brand image is often synonymously used with brand quality. Simonian, et al(2012) argued that because of the absence of physical examination of the products before acquisition in an online shopping scenario, the two primary factors that reduce the perceived risk of a customer are; product brand image and online store image. Horppu, et al (2008) suggested that a customer's previous experience with a brand and the image of the brand are contributors to the online purchase intentions and levels of satisfaction. Perceived usefulness is defined as the extent to which consumers feel the online website could add value and efficacy to them when performing online shopping (Hu et al., 2009). Perceived usefulness could also be defined from an individual's point of view that by using a system would improve task performance. The perceived usefulness of the website usually depends on the efficiency of technological characteristics such as advanced search engines and the personal service provided by the service provider to consumers (Kim et al, 2010).

Various information and high quality goods' descriptions must be provided to the customers to help the customers in making a well-informed decision. (Chen, Gillenson & Sherrell, 2002). Previous studies on the correlation between perceived usefulness and consumer behaviors were conducted (Aghdaie et al., 2011; Hernandez et al., 2011; Ndubisi & Jantan, 2003) revealed that perceived usefulness has significant effect towards online shopping behavior in Spain but Aghdaie et al. (2011) suggested that perceived usefulness do not have significant effect on internet purchasing behavior in Iran. Concerns of price, quality, durability and other product-related aspects are the main drivers of buying decision in developed countries but the considerations could be varying from the developing countries (Ahmed, 2012). According to Enrique et al. (2008), Kim & Song (2010) and Xie et al. (2011), perceived usefulness was proven to have significant impact on the intention to purchase via internet. According to Lim, Osman, Salahuddin, Romle and Abdullah, 2015, perceived usefulness and online shopping behavior have weak positive relationship, university students' actual online behavior tends to be more driven by other variables.

POST-PURCHASE INTENTIONS

Etzion and Pang (2014) stated that online services differ from traditional services because they promote relationship-building and interactivity among users and thus exhibit positive network effects. Referring to service. Post-purchase service Due to the characteristics of online shopping, post-purchase services such as logistic, after-sale evaluation and alteration for accidental damage have an impact on a customer buying decision as well (Kuo et al, 3, 2009). For example, customer's satisfaction for online shop could be improved by the speed of receiving the products, and this satisfaction will decide if customer will achieve a returned purchase. (Rao et al, 2011) Lots of consumers will refuse to shop online due to impossibly for them to well-enjoyed the after-sale service (Chen et al, 2003). Here the service includes timeliness of commercial post service and a series of post-purchase service after receiving the goods. Since the parties of transaction cannot meet with each other and with the problem of distance on terrain and difference on sellers' personality, therefore, post-sale service is a very difficult restriction for online shopping (Chen et al, 2003).

Post-purchase intentions are frequently employed as a basis for forecasting customers' future behaviors (Kuo et al., 2009). It can be explained as customers' intentions to repurchase products or services from the same retailer and communicate their experience of purchasing and using the product or service to their friends (Zeithaml et al., 1996; Wang et al., 2006). Post purchase intentions can be categorized into economic behavioral intentions and social behavioral intentions (Smith et al., 1999). Economic behavioral intentions refer to customers' behavioral reactions in the financial dimension, such as repurchase intention (Anderson and Mittla, 2000; Maxham, 2001; Maxham and Netemeyer, 200, 2003). Repurchase intention means an expression of customer loyalty, which is a significant concept in relation to vendor success (Kim and Son, 2009; Qureshi et al., 2009; Zhang et al., 2011). Besides this social behavioral intentions suggest customers cognitive reactions to the delivery of services for service providers, such as complaining behavioral intentions (Tax et al., 1998) and word-of-mouth communication intentions (Maxham, 2001; Maxham and Netemeyer, 2002, 2003). Another concern for online buyers are the after sale services provided by the e-commerce site. The ramifications of how to exchange products, the length of time allowed to return a product, and the cost associated with the shipping of merchandise back to the online retailer are often concerns associated with an online return policy (Shim, Shin, Yong & Nottingham, 2002). Availability of payment options also affect online purchase (Jain, Verma and Mehta, 2015). Major efforts are made to improve the compatibility of e-commerce website display with all the browsers on the market, as well as the various devices: PC, Mac, tablets and smartphones. Technologies such as HTML5 and responsive design techniques have been invented. A positive relationship between past online purchase frequency and future online shopping intentions is observed implying that customers who purchased more products via internet in past will continue to make online purchases in future too.

OTHER FACTORS

PRICE VARIATIONS: In the commodity economy, prices are affected by many factors, especially the three factors: market value of goods and the relation supply and demand for goods and purchasing power of the currency in circulation. The higher the prices are, the lower the demand for these goods is low and vice versa. For online shoppers, the price is

one of the factors that they are particularly interested. Prices of goods and services in the marketplace are a direct factor affecting the demand for goods and services while online shoppers have more opportunity to choose multiple dealers. Thus, how the strategic price decisions are in order to maintain customers' loyalty is the major problem that every business needs to have a strategic vision (Hoang & Van, 2015). Therefore, factors like, expectations of future deal affect the current online sales (Kwon, Schumann and Fairhust, 2005)

GENDER AND ONLINE PURCHASE INTENTION: An increasing body of literature suggests that information processing is influencing gender differences. Also, there exist gender differences in individuals' reactions to environment stimuli providing evidence of gender differences in online purchasing". With different genders, the purchase intention and sensitivity of consuming the product will be different too and the concept of working women has enhanced it. Gender is "one of the most common segmentation criteria used by marketers".

INCOME LEVEL AND ONLINE PURCHASE INTENTION: Income is a critical factor affecting purchase intention. Wang CCI believe income "plays a crucial role in purchasing decision process" and income has a "certain impact on consumer's purchase intention". Consumers with dissimilar income amounts seem to have different perceptions of the product. With an increase in income "the purchase intention for the product increases

OBJECTIVES

The apprehensions regarding purchasing online can be segregated according to their pre and post purchase intentions, the main aim of this research is:

- To conceptualize the buying behavior according to these intentions
- To understand which factors significantly affect the consumer before his/her purchase
- To understand which factors significantly affect the consumer after his/her purchase.

CONCEPTUAL MODEL

The conceptual model was developed to examine the factors affecting young Indian consumer's online shopping behavior. This model is categorized on the basis of their pre and post purchase behaviors. The pre purchase intentions are defined as consumer's apprehensions which makes him/her reluctant to convert items into cart into a purchase. Post purchase intentions are defined as online purchaser's intentions regarding post purchase services he/she expects after buying online. To increase the online retail in India, it is important to address the apprehensions consumer have before the purchasing (pre purchase intentions) and their apprehensions post the purchase. These apprehensions together form the domain of concerns that the consumer have while purchasing online. Both the categories pre purchase apprehensions and post purchase apprehensions are modelled in this study as- *(1) Theory of Perceived risks and (2) Theory of service and infrastructure risks,* respectively. This is shown in the following figure 1.

Figure 1: Proposed Model of Factors Influencing Indian Shoppers' Online Shopping Behavior
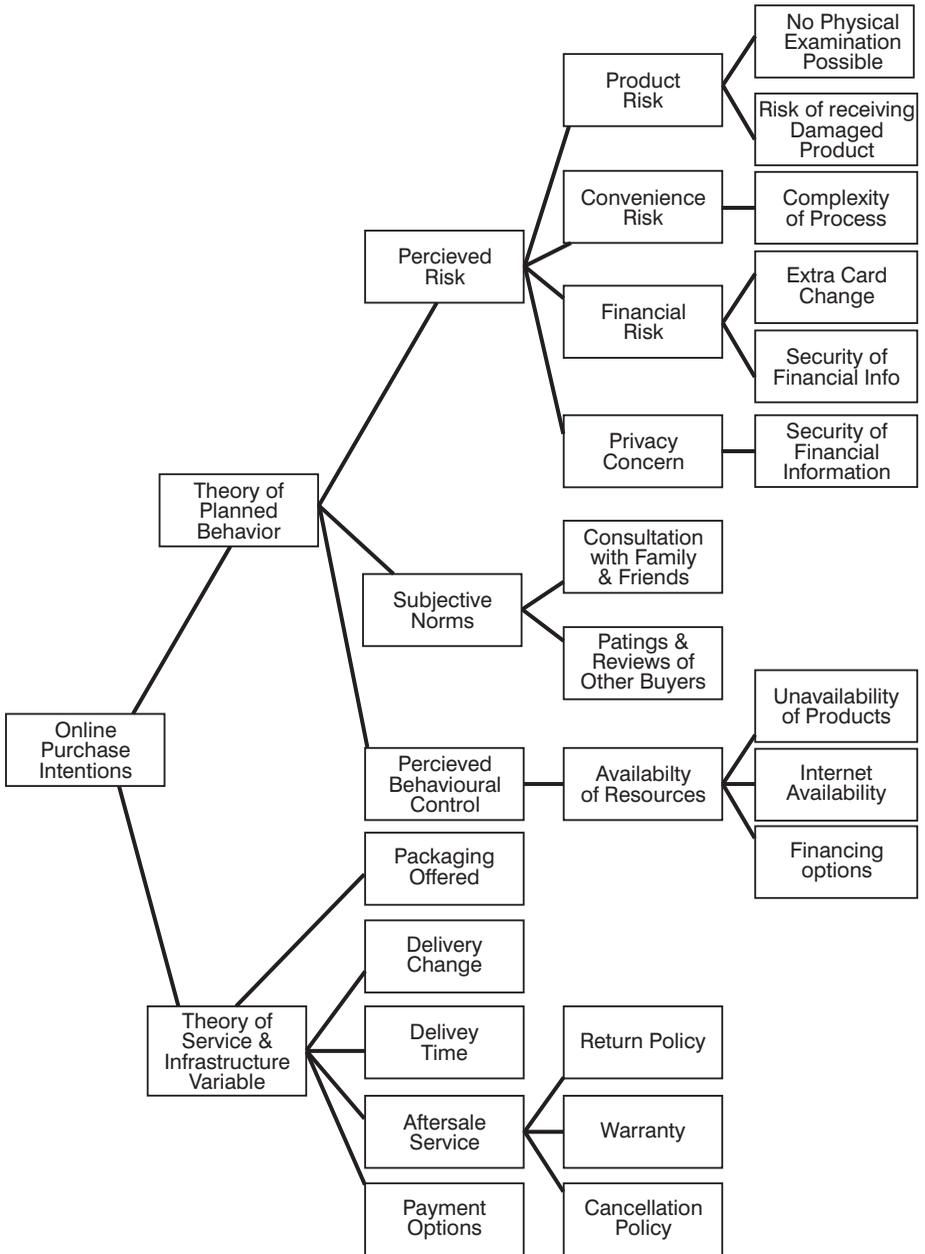
1. THEORY OF PERCEIVED RISK

The theory of Perceived risk refers to "the nature and amount of risk perceived by a consumer in contemplating a particular purchase decision" (Cox & Rich, 1964). Before purchasing a product, a consumer typically considers the various risks associated with the purchase. Many studies have indicated credit card security, buying without touching or feeling the item (tactile input), being unable or facing difficulty to return the item, shipping charges and privacy (security) of personal information as still being the main concerns of online shoppers (Bellman et al., 1999; Bhatnagar et al., 2000; Mohd&Suki, 2006). The higher the perceived risk, the consumer may choose to patronize a brick-and-mortar retailer for the purchase of the product. Whereas, the lower the perceived risk, the higher the propensity for online shopping (Tan, 1999). According to Koller (1988), the degree of importance of the situation determines the potential effect of risk. Consumers have shown reluctance to complete online transactions (Hoffman, Novak et al. 1999), primarily due to risk concerns. Therefore, perceived risk is posited as a prominent barrier of consumer acceptance of online services in an e-commerce environment. Consumer perceptions of risks inherent in product adoption and usage have been studied for many years by Bauer and Cox (1967); Dowling and Staelin (1994). This immense literature on perceived risk however has not been applied to the relatively new e-services context in an attempt to better predict evaluation and adoption. Theory of Perceived risk is sub divided into three kinds of risks- *(1.1)Perceived Behavior (1.2) Subjective norms and (1.3) Perceived behavior control*

(1.1) PERCEIVED BEHAVIOR contains mainly 4 kinds of risks- (1.1.1) product risk , (1.1.2) convenience risk (1.1.3) financial risk and (1.1.4) privacy risks. They are explained below.

(1.1.1) PRODUCT RISK

It is defined as the risk of receiving the product that is different from what's perceived to be in the product description. This could be resulted from the quality of the retailer's product description and the visual representation of the product, significantly influencing the consumer's ability to understand the product, Glover and Benbasat (2011). Inability of physical product examination and insufficient product information on screen may increase concerns of consumers. The issues surrounding product risk associated with on-line shopping resulted in the following hypothesis, Lim (2003).

(1.1.2) CONVENIENCE RISK

It is defined as the discontent comes from shopping via the Internet. Discomfort in online shopping is associated with the steps required to complete personal details to processes the check-out forms. The ease of shopping at the online retailer's website influence consumers' perceptions of the level of convenience risk (Jarvenpa & Tractinsk, 2001). Methods for reducing convenience risk include providing an easy to navigate website as well as an extensive customer service center. A call center, return policy, and a variety of payment options all assist consumers in feeling more at ease (Lee, 2002).

(1.1.3) FINANCIAL RISK

Financial risk is defined as the risk involved in conducting financial transaction through the internet. This involves risk of extra credit card charges, loss of financial information. Previous research found financial risk being a primary reason consumers choose not to

shop online (Miyazaki & Fernandez, 2001; Teo, 2002). Consumers are likely to be hesitant to shop online when they have concerns associated with financial risks, such as the loss of credit card information, theft of credit card information, or overcharge (Bhatnagar, Misra & Rao, 2000; Forsythe & Shi, 2003).

F.Cunningham, H.Gerlach et al. (2005) found perceived risk is present at each stage of the consumer buying process. Their findings show the introduction of financial risk and the continued significance of performance risk at purchase stage. Previous analyses of risk types suggest that financial risk is the most important contributor to perceived risk.

(1.1.4) PRIVACY CONCERN

One of the most commonly mentioned problems about online markets is the intrusion of privacy, which refers to the improper access, collection, monitoring, analysis, transfer and storage of confidential consumer information (Bloom et al.,1994).The privacy of personal information is recognized as a fundamental theme in marketing literature in both offline (Jones, 1991) and online contexts (Miyazaki & Fernandez, 2000). The information privacy was initially defined as the individual's ability to control the conditions under which his/her personal information is collected and used (Westin, 1967).

The first reference in the literature to an instrument for measuring privacy concern about personal information is the scale called "Concern for Information Privacy" developed by Smith, Milberg, and Burke (1996). In this work, the authors developed a theoretical framework that conceptualizes privacy concerns about personal information in the following five key dimensions: collection, unauthorized secondary internal use, unauthorized secondary external use, improper access and errors. h. In order to maximize the potential of E-commerce, it is especially important to realize in detail consumers' online information privacy concerns. Despite a few pioneering studies addressing the issue of online privacy in general, such as Miyazaki and Fernandez (2000) and Sheehan and Hoy (2000), no studies have provided a specific theoretical framework to privacy concerns in the context of the Internet.

1.2. SUBJECTIVE NORMS

According to the Theory of Reasoned Actions, TRA, (Azjen & Fishbein, 1980), subjective norms capture the consumer's perceptions of the influence of significant others (e.g., family, peers, authority figures, and media). Subjective norms tend to be a strong influential factor especially in the early stages of innovation implementation when users have limited direct experience from which to develop attitudes (Taylor & Todd, 1995). It is during this stage of attitudinal development that online retailers can influence shoppers' propensity for purchasing behaviors (Yu and Wu, 2007). Most of the studies on subjective norm are mediated by purchase intentions before performing actual buying (Choo, Chung & Pysarchik, 2004; Limayem et al., 2000; Jamil & Mat, 2011; Zhou, 2011). A related finding by Jamil and Mat (2011) proposed that subjective norm does not significantly influence actual buying through the internet but have a profound significant effect on online purchase intention. The results implied that families, friends and the media only have a minor influence on the actual internet purchasing.

1.3. PERCEIVED BEHAVIORAL CONTROL

Ajzen and Madden (1986) extended the TRA into the Theory of Planned Behavior (TPB) by adding a new construct "perceived behavioral control" as a determinant of behavioral

intention and behavior. Perceived behavioral control refers to consumers' perceptions of their ability to perform a given behavior. TPB allows the prediction of behaviors over which people do not have complete volitional control. Perceived behavioral control reflects perceptions of internal constraints (self-efficacy) as well as external constraints on behavior, like availability of re-sources. Perceived Behavioral Control (PBC) directly affects online shopping behavior (George, 2004) and has a strong relationship with actual Internet purchasing (Khalifa & Limayem, 2003). Unavailability of product also affect buying decision. According to Steinhart, Mazursky and Kamins (2013), both product availability and lack of availability have the potential to trigger the intention to buy.

2. SERVICE & INFRASTRUCTURE VARIABILITY

In the above section we discussed the pre purchase intention of the consumer when he/she is buying online. In this section we discuss about consumer's apprehensions related to post their purchase. While purchasing online, since the market virtual consumers are skeptical about the availability of post purchase services. They compare the post purchase services available to them in offline purchase to the one available for online purchase. To compel them to purchase online instead of offline, the online shopping sites have to provide them satisfying post purchase services, which will help them curb their post purchase concerns. Thus major concerns under service and infrastructure includes- packaging ordered, delivery charges delivery time, payment options, after sale service, return policy, warranty, cancellation policy.

Additional challenges for e-commerce diffusion in developing countries like India are the lack of telecommunications infrastructure throughout the country (e.g., low computer usage and Internet penetration along with the lack of qualified staff to develop and support e-commerce sites (Bingi et al., 2000; Hoffman, 1999). These concerns may no longer be significant deterrent for online shopping in many developed countries. The concerns associated with delivery of the product ordered, such as shipping fees, delayed delivery and/or not receiving a product ordered. This is due to most India's postal careers being unreliable except for the government owned one that is pricey. Thus, online shoppers are forced to choose the pricey postal career for more secure delivery or to take a risk of not getting the product delivered when choosing other careers.

Provision for aftersales services like, return policy, warranty, and cancellation of order etc., is often a concern to online shoppers (Teo, 2002). The ramifications of how to exchange products, the length of time allowed to return a product, and the cost associated with the shipping of merchandise back to the online retailer are often concerns associated with an online return policy (Shim, Shin, Yong & Nottingham, 2002). Availability of payment options also affect online purchase (Jain, Verma and Mehta, 2015). The variables concerned in the section are illustrated in the above diagram (Figure 1).

HYPOTHESES

Given the above conceptual framework , we would like to study if less frequent buyers are affected by pre purchase concerns such as product risk, privacy risk, delayed delivery risk, delivery charges etc. we would like to study the significant impact of   post purchase concerns over frequent buyers, which are- return policies, consideration of rating and review, payment options, product warranty etc. Following hypothesis is thus studied in this research,

Hypothesis 1:less frequent buyers are not affected by pre purchase concerns

$H_o:\beta_i=0$ i = pre purchase intention question

Hypothesis 2: frequent online buyers are not affected by post purchase concerns

$H_o:\beta_j=0$ j = post purchase intention question

RESEARCH METHODOLOGY

A survey was developed to identify factors that influence Indian online shoppers' behavior. Variables examined are technology specific innovativeness, perceived risks (financial risk, product risk, convenience risk and non-delivery risk), perceived behavior controls, demographics and service and infra-structural factors (cyber laws, shipping charges and after sales service. Item scales ranged from strongly agree (1) to strongly disagree (5). To understand the pre and post intentions of the consumer while purchasing online, the data was bifurcated on the basis of consumer purchasing online frequently and less frequently. Such a distinction could help bring out the pre and post purchase intentions. This was so taken as, the consumer purchasing less frequently online, is more apprehended with pre purchase intentions, which have been explained above in the conceptual model. Consumers purchasing online frequently are more concerned post purchase concerns, as they are regular buyers. The domain of re and post purchase intentions are not mutually exclusive. But we can deduce that, consumer buying less frequently online is more concerned with the pre purchase apprehensions and consumer buying online frequently is more concerned with post purchase apprehensions, as this consumer has already weighed out the pros and cons of online buying and to make purchasing smooth, he/she is concerned with post purchase concerns.

The sample selected for this study consisted of students in Delhi region. A total of 284 surveys were administered which were all collected through online survey method. The 22 odd questions in the sample are-Card Charges, Buying goods without physical examination, Security of Personal Details, Loss of Card Details, Risk of receiving Damaged Goods etc. since the study is divided into pre and post purchase intentions, which in the study is taken under the heads of- perceived risk and service and infrastructure respectively. The data were analyzed using SPSS 23.0. First the division of the data into frequent and less frequent buyers is studied using Cluster Analysis. In this we use Two stage cluster analysis. The data was clustered according to common characteristics. This was done to find out come characteristics of frequent buyers and less frequent buyers, so that we can proximate each for post purchase intentions and pre purchase intentions respectively. Principal Component Analysis (PCA) using Varimax rotation with Kaiser Normalization conducted on the online shopping behavior measures. Then multiple regression analysis was done and significance of coefficient were analyzed.

FINDINGS

The analysis of data containing 284 respondents on the basis of their responses to the questions regarding their online purchase behavior, have been first studies using cluster analysis. The results shows that, the data has been divided into two cluster using two step

cluster analysis, with cluster 1 containing 112 responses (39%) and cluster 2 containing 172 responses (61%).the respondents in cluster 1 are seen have more concern with physical examination of product before buying online, extra debit/credit card charges while purchasing, receiving damaged product, delivery charges, delay in delivery etc. from these concerns we can deduce that this cluster belongs to less frequent online buyers, as they have apprehensions which an individual have before the purchase. The result shows that in cluster 2, respondents are more concerned with cancellation policy, return policy, payment options, product warranty, expectations of future discounts etc. From this we deduce that cluster 2 contains the respondents who are frequent buyers. They are more concerned with post purchase apprehensions than cluster 1 respondent. Hence, it was justified to bifurcate the data according to the frequency of online purchase by the respondents, to study the effect of pre and post purchase intention on a consumer's online buying behavior.

The analyzes of sample data shows that, there were 125 less frequent buyers and 159 frequent online buyers (Figure 2). Dividing each with respect to gender, we see

Fig. 2: Percentage of Less Frequent and Frequent Buyers in the Sample Data
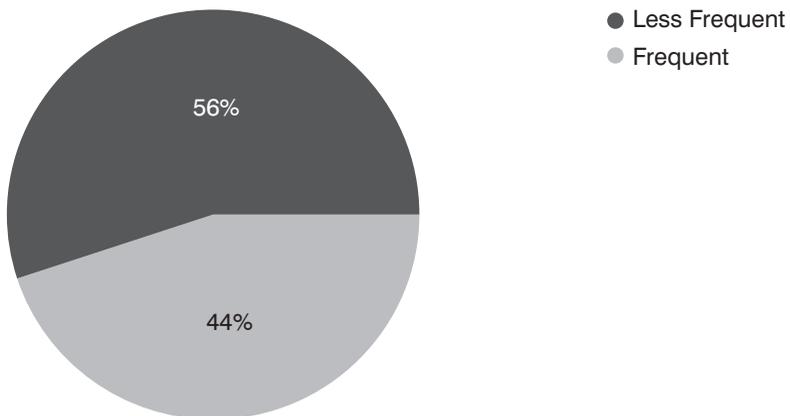
Using PCA on each type of data (less frequent buyer's data and frequent buyers data) separately, dimensions of the variables were reduced. The factors with eigen value greater than 1 were retained. 8 components were extracted in both the cases. Then reliability test using Cronbach's alpha was done to check the validity of the sample questions. The construct measures with Cronbach's alpha below 0.708 for less frequent buyers and below 0.625 for frequent buyers were retained. The Cronbach's alpha value and factor loading is presented in below table (Table 1). From the factor loading and cronbach's alpha in each case, 10 variables were extracted for regression analysis in each type of category.

Table 1: Cronbach's Alpha Value for Each Variable for Less Frequent and Frequent Buyers

S.no.	Variables	Type of intention	Cronbach's alpha (less frequent buyers)	Cronbach's alpha (frequent buyer)
1.	Card Charges	Pre- (Financial risk)	0.699	.626
2.	Buying goods without physical examination	Pre- (Product risk)	0.611	.632
3.	Security of Personal Details	Pre- (Privacy risk)	0.671	.602
4.	Loss of Card Details	Pre -(Financial, privacy risk)	0.701	.626
5.	Risk of receiving Damaged Goods	Pre-(Product risk)	0.601	.616
6.	Complexity of Buying Process	Pre -(convenience risk)	0.711	.642
7.	Packaging Offered	Post (Services & infrastructure variable)	0.713	.616
8.	Delivery/Shipping Charges	Post (Services & infra variable)	0.654	.619
9.	Financing Options	Post (Services & infra variable)	0.721	.618
10.	Delivery Time	Post (Services & infra variable)	0.709	.621
11.	Return Policy	Post (Services & infra variable)	0.698	.601
12.	Cancellation Policy	Post (Services & infra variable)	.711	.602
13.	Payment Options	Post (Services & infra variable)	0.688	.599
14.	Warranty of Product	Post (Services & infra variable)	0.721	.616
15.	Consultation with Family/Friend	Pre (Subjective risk)	0.709	.611
16.	Ratings and Reviews	Pre (Subjective risk)	0.654	.633
17.	Retail Prices	Pre (Price variation)	0.688	.642
18.	Future Discounts	Post (Price variation)	0.711	.599
19.	Income Accumulation	Pre (Demographic)	0.709	.606
20.	Unavailability of Product	Pre (Perceived Behavior Control)	0.678	.611
21.	New products	Post (Innovativeness)	0.713	.611

The result from regression analysis on less frequent and frequent buyers is represented in table 2 and table 3 respectively.

Table 2: Regression result from less frequent category

Variable name	Beta	p value
Card Charges	-.108	0.003*
Buying goods without physical examination	-.044	0.025*
Security of Personal Details	-.080	0.238
Loss of Card Details	.083	0.098
Risk of receiving Damaged Goods	.001	0.058
Complexity of Buying Process	-.037	0.0021*
Consultation with Family/ Friend	.049	0.098
Ratings and Reviews	-.114	0.132
Retail Prices	-.002	0.0031*
Income Accumulation	.002	0.257

*Implies $p < 0.05$, significance

Descriptive statistics of the less frequent buyers category show that there were 44% male and 56% female in less frequent category. As it can be seen from the regression result, for less frequent buyers, which represent pre purchase intentions of online buyers, show that credit/ debit card charges, buying goods without physical examination, complexity of buying process and comparison with retail prices were found to significant effect the buying behavior of less frequent buyers. Thus null hypothesis was rejected that pre purchase intentions does not affect the buying decision of a less frequent buyer. The negative sign associated with card charges means that as card charges increase, consumers love for buying online significantly decreases. Similarly, the lack of physical examination of the product before purchase also negatively affects his/ her buying behavior. Negative reviews and rating of the shopping sites and perceived risk of buying expensive product than offline retail also negatively affects his/her buying decisions.

Table 3: Regression Result from Frequent Category

Variable name	Beta	p-value
Packaging Offered	.011	0.067
Delivery/Shipping Charges	-.019	0.045*
Financing Options	.045	0.56
Delivery Time	.039	0.0321*
Return Policy	.037	0.0031*
Cancellation Policy	.038	0.098
Payment Options	.062	0.189
Warranty of Product	.037	0.044*
Future Discounts	-.046	0.154
New products	-.029	0.078

*Implies $p < 0.05$, significance

The descriptive statistics of frequent buyers shows that 53% male and 47% female in frequent buyers category. The regression results show that for frequent buyers who are more apprehended by post purchase concerns are significantly affected by delivery and shipping charges. High delivery or shipping charges negatively affects the frequent buyers buying decisions. Also frequent buyers are positively related by online time delivery of the products, healthy return policy and good warranty of the product. These variables make it comfortable for the regular buyers to buy consistently through online sources. Thus service and infrastructure policies significantly affects the frequent consumers buying decisions.

CONCLUSION

People in India are using Internet for last few years (on an average more than 3 years) for different purposes like, banking, buying travel tick-ets etc. but not for anything for which they do not need to queue up. The results of this study shed insights of online retailing in India - specifically factors affecting Indian consumers' pre purchase intentions and post purchase intentions regarding online buying behavior. From the variables extracted it was seen in the study that convenience risk, product risk, privacy risk and financial risks significantly affected a less frequent buyers online behavior while purchasing online. Since data was almost equally divided into male and female it can be concluded that the pre purchase intentions including -card charges, buying goods without physical examination, security of personal details, loss of card details, risk of receiving damaged goods, complexity of buying process, consultation with family/ friend, ratings and reviews retail prices and income accumulation, were all important factors determining the behavior of a less frequent buyer. In the study credit/ debit card charges, buying goods without physical examination, complexity of buying process and comparison with retail prices were found to significant effect their buying behavior. For frequent buyers who are more concerned with post purchase intentions, it was found that packaging offered, delivery/shipping charges, financing options , delivery time return policy cancellation policy payment options warranty of product   future discounts, new products, were important factors determining their behavior. Amongst them in the study delivery and shipping charges. High delivery or shipping charges negatively affects the frequent buyers buying decisions. Also frequent buyers are positively related by online time delivery of the products, healthy return policy and good warranty of the product. These variables make it comfortable for the regular buyers to buy consistently through online sources. Thus service and infrastructure policies significantly affects the frequent consumers buying decisions.

There are a few implications from these findings on online shopping that merit attention. Such as, retail companies should start taking measures to eliminate risk factor and build trust in this form of retail. The retail managers should sway consumers through ads, promotions, online only discounts etc. to let people cross the threshold and start buying because Indian consumers are still comfortable with brick and mortar format as they appreciate friendly approach of salesman and social element of shopping, which has been found as important customary element in shopping. The findings of the study will help online retailers to better understand the psyche of consumers and equip themselves to attract consumers towards online format. They could introduce money back guarantee, insured and assured delivery to alleviate risk factors. It would help managers understand the online consumer better and work towards new area of retail in India as Inter-net shopping would help retailers present a potential-ly low cost alternative to brick and mortar option.

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A REVIEW ON FUZZY MODELS OF INVENTORY MANAGEMENT

ABSTRACT

Inventory is the foremost asset of any business organisation. Inventory in basic sense is a stock of goods, commodities and other economic resources which are preserved for smooth and efficient functioning of any business undertaking. Therefore, formulation of the best possible model of the inventory system is of utmost importance in the domain of inventory management. Inventory management is a field of great scientific research. But, it is important to ensure that the process under consideration is reliable. In some cases it is very difficult to determine the value of certain factors. In such cases the best option is to take fuzzy models of the inventory management into consideration. In the proceeding paper an analysis has been done considering the present models of the inventory control.

Keywords: EOQ, EPQ, fuzzy set theory, inventory control, models under uncertainty.

INTRODUCTION

Inventory control is the basic problem faced by every organization. There is no standard solution to this problem as the problems faced by each organization are different and different conditions prevail in individual organizations. Thus, the main feature of the inventory management is to develop the most suitable inventory control model to solve this issue. Inventory management models are implemented in such a way that solutions obtained from these models can be easily implemented in situations where the existing conditions in the inventory system change rapidly. But uncertainty is the main feature that rules every system of the inventory. Thus it is necessary to formulate a systematic approach for the problem management. The models of the inventory system are distinguished on the basis of various variables like demand, characteristics of the system, cost structure etc. There is a lot of variability as well as uncertainty in such characteristics. The main motive of this study is to target the models of the inventory system under uncertainty, to classify it into groups and find the future scope of this research.

MANAGEMENT OF THE INVENTORY SYSTEM

In order to carry out the normal routine activities of any organization, a stock of goods is maintained. A proper and optimal strategy for inventory control is mandatory for increasing the efficiency of the use of resources, making assets available which have been stored in the form of stock of goods etc. The most important parameters that have to be considered for proper implementation of the inventory control are:

1.   What should be the size of the order of the inventory replenishment?

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2.   When should the replenishment order of the inventory system be placed?

The inventory management reduces the above listed problems and makes the system more profitable. Such a strategy which minimizes the sum of all kinds of costs associated with the inventory control is optimal.

There are numerous models of the inventory management depending on the information as well as properties associated with the system under consideration. The model of the inventory system in which the values of the model parameters are well defined such a model is deterministic model whereas the model of the inventory system in which the parameters are in the form of random values with a probability that is know is called stochastic or probabilistic model. If there is no change in the parameters of the model then such a model is known as static otherwise it is known as dynamic model. Static model is used to get the one time decision about the level of reserves for a specific period of time and dynamic model is used to obtain sequential decisions about the level of sock or to make adjustments in the decisions that had been made earlier, considering all the changes that had occurred in that span of time. When it is not feasible to apply the static pattern in the parameters of the system, in such a case it is mandatory to obtain the solution of the model of the inventory system with the application of fuzzy logic.

Following are the characteristics that are taken into consideration for the models of inventory management:

* **SINGLE VERSUS MULTIPLE ITEMS:** According to this characteristic selection of a single item or multiple interdependent items which is to be made for calculations is primarily based on the budget of the collective items, related constraints or coordinated controls.

* **NUMBER OF STOCKING POINTS:** In certain cases it is appropriate to select a single stocking point which is isolated. But in reality the inventory system of the similar items are generally placed at different locations. In case of multi-echelon situations, if an order is received at one of the location (a warehouse which is a branch) then it becomes a part or the entire demand at the other location (central warehouse). Also there can be multiplicity which is horizontal i.e. there can be shipment or distribution of items from one warehouse to another.

* **TIME DURATION:** In certain situation involving a particular season for the sale of products, the stock of goods which is in excess cannot be stored for its utilization in the next season. For cases of such types a single period of inventory management model is required. In case where multiple periods have to be taken into consideration we

apply the approach of the rolling horizon implementation. In this situation relatively smaller number of periods of the future are taken into consideration and these periods are generated at the beginning of each period. The implementation of the decision takes place in the current period and the problems are resolved at the beginning of the next period.

- **NATURE OF PRODUCT:** The characteristics of the product are considered on the basis of the type of the product. The different types of products are classified on the basis of perishability of the product, consumability, repairability or recoverability. Every item undergoes deterioration when it is stored and it cannot be ignored. Though there may be a difference in the type of deterioration that a product undergoes due to the difference in the conditions.

- **NATURE OF DEMAND:** The demand process of a commodity depends on various factors. The classification of demand is shown in figure.1. Primarily there are two types of demands, they are deterministic and probabilistic. Deterministic demand is exactly known demand whereas the probabilistic demand is the unknown demand. Deterministic demand is further of two types i.e. static and dynamic. Static demand is fixed demand which does not vary. It is a certain demand whereas dynamic demand is that demand which is variable. It varies with respect to time but its variation with time is known with certainty. The probabilistic demand is further classified as stationary demand and non-stationary probabilistic demand. Stationary demand is the one in which the parameters are known and this demand follows a probability distribution which can be easily estimated from the previous data. The most commonly used distributions in this regards are normal, poisson and gamma distribution. In non-stationary probabilistic demand is the one which is evolved with the passage of time. On the basis of the sources of demand it is further divided into independent and dependent demand. Independent demand is the demand which is related to the individual consumers. The dependent demand comes into existence when the manufacturer considers various factors which lead to the manufacture of the finished product. Such demands are inter-related and depend on the production plan for manufacturing goods.
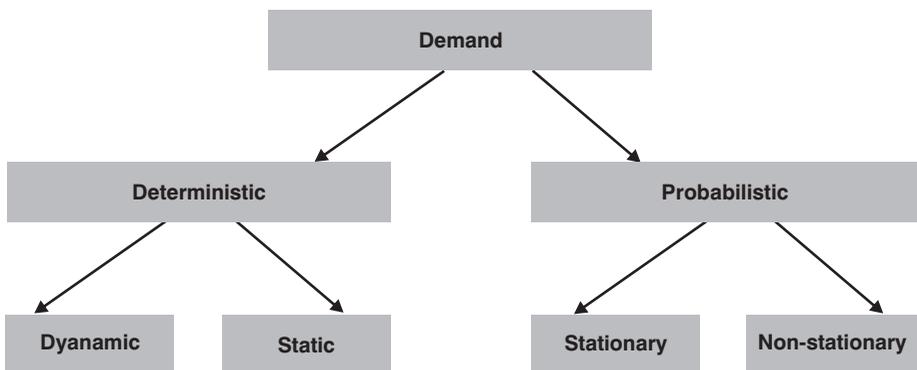

Figure 1. Classification of demand

- **NATURE OF SUPPLY PROCESS:** is basically concerned with the constraints or the restrictions that have been imposed on the inbound process of the supply chain system. The size of the order, whether it is minimum or maximum the lead time in case of replenishment are the typical examples in this regard. In 2008 Silver identified the lead time in the form of three possible outcomes. The first one includes a known lead time, the second includes the one which shows replenishment after a time interval which is random in nature and the third is the main form where there is an effect of the seasonal factors on the time duration required to prepare an order. It is assumed that the lead time is constant and also known.

- **PENALTY AND DEFICIT:** The main purpose of the establishment of a warehouse is to overcome the shortage of the goods procured by the inventory system. If there is a loss of stock it leads to the loss of the manufacturer. Such kind of losses are called the penalty for the deficit.

Every model of the inventory system is a portal of the real system. If more number of characteristics of the model are taken into consideration it meets the requirements of the real system.

Thus it is a great challenge for the researchers to obtain the values of the mathematical parameters of the inventory system which are realistic. Generally the researchers performing the task of determining the values in such an environment which involves unknown mathematical parameters. As the demand rates of a commodity are generally unknown and depend on the customers thus this task is completely uncertain. Also the manufacturing of commodities and their lead times are completely uncertain thereby increasing the degree of uncertainty in the entire process. The prevalent system of the inventory management basically focuses on the deterministic parameters and the modules which do not meet the requirements of the real world. In such cases the fuzzy models of inventory management are the most important. Fuzzy models deal with all kinds of uncertainties in the inventory system by analyzing it in a quantitative manner. The fuzzy set theory was proposed by L.A. Zadeh in 1965. It has become the most prominent means to model the vague data in the field of applications of production management. In 1973 Galbraith studied the concept of uncertainty and defined it as the difference that exists between information that is required for performing a particular task and the information that is already available in this regards. The production process is affected by the presence of various kinds of uncertainties. In 1989 Ho segregated the uncertainties prevalent in the inventory system into two kinds, i.e. environmental uncertainty and the system uncertainty. Environmental uncertainty refers to the uncertainty which is not included in the production process. Uncertainty like demand and supply uncertainty is a kind of environmental uncertainty. The uncertainty in the production process is referred to as system uncertainty. For example: the uncertainty related to the production process in the form of operation yield uncertainty, lead time of production uncertainty, quality uncertainty, change in the structure of the product and production system failure. Considering the different kinds of uncertainties various models of the the inventory management came into existence.

The fuzzy models of the inventory control are given below:

1. Economic order quantity models
2. Economic production quantity models
3. Joint economic lot sizing models

4. Continuous review system models

5. Periodic review system models

1. ECONOMIC ORDER QUANTITY MODELS

The inventory models involving the fixed order size are known as the economic order quantity (EOQ) models. The basic EOQ model is a sort of formula for obtaining the least carrying cost and ordering cost by finding the optimal order size. The basic assumptions for this model are:

1. Demand is constant with respect to time and is also known.

2. Shortages are not allowed.

3. There is a constant lead time for the order.

4. All the order quantity is received at once.

EOQ model was developed by Ford W. Harris in the year 1913 and was published in Factory in 1913, the magazine of management. A lot of researches were carried out using this model. K.S. Park was first researcher who applied fuzzy set theory. He developed a single commodity model of the inventory system having fuzzy parameters. This was developed considering the model proposed by Harrison. In 1996, Chen and Wang provided the extended version of the crisp models of the inventory system in the form of fuzzy models. Later in 1997, Roy and Maiti, in 2000 Yao et al and Chang in 2004 developed the fuzzy inventory models on the basis of crisp models.

Table 1 : Economic Order Quantity Model

S. NO.	MODEL PROPOSED BY:	MODEL INPUT PARAMETERS			
		QUANTITY ORDERED	COST OF ORDER	COST OF HOLDING	DEMAND (ANNUAL)
1	PARK (1987)	CRISP	FUZZY	FUZZY	CRISP
2	LEE AND YAO (1999)	FUZZY	CRISP	CRISP	CRISP
3	YAO ET AL. (2000)	FUZZY	CRISP	CRISP	FUZZY
4	YAO AND CHANG (2003)	CRISP	CRISP	FUZZY	FUZZY
5	WANG ET AL. (2007)	CRISP	FUZZY	FUZZY	CRISP

2. ECONOMIC PRODUCTION QUANTITY MODELS

Economic production quantity model (EPQ) is used to obtain the quantity of the commodity which has to be ordered by the company or the retailer by focusing on minimizing the total cost of the inventory system. This cost is minimized by maintaining a balance between the holding cost and the average ordering cost which is taken as fixed. The EPQ model was proposed by E. W. Taft in the year 1918. It is an extension of the basic EOQ model. There is a wide application of the EPQ model. In order to add realistic values to the EPQ model various assumptions have been taken into consideration. Due to the decrease in the number of natural resources and increase in the cost of the raw materials the research activities have become very popular in this domain. In 1998 Lee and Yao

proposed the EPQ model in the modified manner having different forms of input parameters in the form of fuzzy variables. Here the per day demand and the production quantity is taken into consideration. In realistic conditions both of these vary by a small amount every day. In 1999, Chang studied a production model of the inventory system in which the amount of the product is a fuzzy variable. He also considered both the crisp and the fuzzy aspects for obtaining a solution of this problem. Lin and Yao in 2000 based their study on the fuzzy aspect of the production model of the inventory system. In 2002 Hsieh proposed two production models in fuzzy system having parameters in the form of fuzzy variables for both crisp and fuzzy production quantity. The total production cost of the inventory system in these models was proposed in the form of fuzzy arithmetic operations using the function principle. The total cost of these models was de-fuzzified by using the graded mean integration representation method. In 1998 Lee and Yao obtained the demand and the production quantity per day in the form of fuzzy values.

3. JOINT ECONOMIC LOT SIZING MODELS

The Joint economic lot sizing models of the inventory system deal with the issues relating to the coordination between the buyer and the seller. The main motive of these models is the development of the joint and coordinated strategy of the inventory system dealing with the buyer-seller which has higher benefits in comparison with the inventory strategy of each member which is non-coordinated. In 1996 Lam and Wong provided an extension to the proposed model of Dolan. In this case mathematical programming in the fuzzy sense was used to obtain the solution of the joint economic lot size problem having multiple price breaks. In 2004 Das, Roy and Maiti developed a model of the inventory system for deteriorating goods. Here multi-objective models are developed in both crisp and fuzzy system. The main motive is to minimize the buyer's total average cost and maximize seller's revenue.

In 2006 Ouyang et al introduced the concept of defective goods in the joint economic lot sizing models. In this model various modelling techniques for managing defective rate in the inventory model involving buyer-vendor integrated model. In this model three different cases are studied and they are the defective rate of the crisp system, defective rate of fuzzy system in triangular form and the defective rate of the statistic fuzzy. In the cases involving fuzzy system signed distance method is used to estimate the sum total cost of the fuzzy system. Yang in 2007 proposed an inventory model to formulate a strategy of the optimal nature for the vendor-buyer model of the inventory system having annual demand and the production rate of fuzzy nature and the respective quantity ordered by the buyer is obtained accordingly.

4. SINGLE-PERIOD MODELS

The newsvendor model is the appropriate example of the single period model of the inventory system. Also it is a probabilistic model which aims to obtain the order quantity that minimize the shortage cost and also the inventory holding cost. D. Petrovic in 1996 designed the first single period model of the inventory system. He also proposed the concept of fuzzy set of the second level, method involving s-fuzzification and the arithmetic

defuzzification. Ishii and Konno in 1998 proposed the concept of fuzziness involved in the shortage cost into the classical newsboy problem. In this model involving the vague shortage cost denoted by L shaped fuzzy number. The total profit function was also assumed to be a fuzzy number. The total profit that is expected from the problem was taken to be a fuzzy number. The optimal ordering quantities of both fuzzy and non-fuzzy newsboy problem were compared. Kao and Hsu in 2002 developed a model of the inventory system of the single-period having demand of fuzzy nature. Dutta et al. In 2005 developed a single-period model of the inventory system in an environment without certainty. The main objective of this paper is to portray demand function as a random variable of fuzzy sense. According to this model the optimal order quantity is determined by using a new methodology for the random fuzzy variable by graded mean integration method. For the illustration of this problem the classical newsboy problem was taken into consideration.

5. MULTI-PERIOD MODELS

The basic difference that exists between the single-period and the multi-period model of the inventory system is that in case of the multi-period model have a left-over stock from the previous periods due to which an optimal choice of the order quantity becomes very complicated. In case of applications related to the real world the decisions related to production and inventory are dependent on each other and also of temporal nature. For the formulation of the multi-period lot sizing models fuzzy system is highly beneficial. In 1981 Sommer proposed a model of the inventory system using the dynamic programming in the fuzzy environment in order to obtain the optimal production and the levels of the inventory system in realistic situations for multi-period production scheduling and inventory problems related to an organization which in involved in a withdrawal from the market of a planned form. In 1982 Kacprzyk and Staniewski applied the concept of the fuzzy theory to obtain the optimal strategy for the inventory replenishment for the management objectives of long-term duration. Lee at al. In the year 1990 introduced the concept of material requirements planning (MRP) by defining the demand of a particular period as fuzzy number. Period balancing algorithm in the form of fuzzy number was developed in this regards. In 1991 Lee at al. Provided an extension to their previous study based on the fuzzy lot sizing for the multi-period models and also introduced fuzzy logic to the models developed by Wagner-Whitin and Silver-Meal models for the lot sizing. Liu in the year 1999 proposed a model involving the application of fuzzy decision making for the investigation of the optimal policy of the inventory system for a multi-period model for partial back orders.

CONCLUSION

In every business organization proper management of the inventory system has become the main thrust area since past years. Numerous novel models for the management of the inventory system have been introduced. In the present study we have presented the literature review of the models of inventory management considering the aspect of uncertainty on the system. majority of models in this context have taken into consideration only one type of the uncertainty and also the models having a simple structure of the process of production. Fuzzy logic is primarily applied on the cost of the system as well as the demand.

Various assumptions have been taken into consideration for each model of the inventory system and it is linked with some sort of advantages on one hand and disadvantages on the other hand. The researchers are still focussing on the development of the models of the inventory system applying fuzzy logic approach. By examining all the aspects of the inventory system we observe that the fuzzy logic approach is the most appropriate for inventory management as it provides a reduction in the total expenses of the inventory system.

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SOCIAL MEDIA MARKETING AND ITS RELATIONSHIP WITH QUALITY OF SERVICES IN BANKING INDUSTRY: A PROPOSED MODEL

ABSTRACT

The social media has emerged as one of the powerful tools for social networking, connecting people together, accessing information and sharing content online with one another. Marketer uses the social media marketing for promoting its products and services to customer. The high reliability of social media, its   consistency and instantaneous features made the social media to open place for business such as online marketing. Marketing which occurs via social media is known as social media marketing. The wide acceptance of social media has made possible for companies to reach targeted consumers easily, effectively and instantly. This has brought improvement in the quality of services and it is assumed that the high quality of service believed to be influenced by customer value and customer satisfaction, again the customer satisfaction directly influence the customer loyalty.. Besides that, social media marketing also faces several challenges in the field. This article argues on social media marketing advantages and disadvantages and how it is beneficial in improving quality of services in the present era.

KEY WORDS: Customer Satisfaction, Service Quality, SERQUAL, SERVPREF etc.

INTRODUCTION

The use of internet as the mean of interpersonal communication has grown significantly in the recent years and the Internet users have increased rapidly. The internet as the mean of interpersonal communication has became important in today's life. The way that people communicate, search for and exchange information with each other have changed noticeably over the years (Hennig-Thurau et al., 2010). Social media such as Facebook, Twitter, or YouTube are becoming increasingly important for marketing. Nowadays, customers can act as co-creators, this allows for a huge viral outcomes and creates opportunities for word-of-mouth marketing (Libai et al., 2010). So, both company and customer became more involved in the conversation about the brand (Deighton and Kornfeld, 2009; Hennig-Thurau et al., 2002). During the last few years social media has become one of the most exciting topics. They can be used by companies, businesses, brands to integrate and interact with their customers (Dholakia et al., 2004). Nowadays, fan pages on social networking sites have important relevance for companies in marketing communication. Despite their relative newness; social media applications are being widely used by Indian Internet users. Marketers are of this fact; they are now taking advantage of social media to design their marketing communications. This kind of communication is expected to build and enhance customer relationship quality. In this context, studying how social marketing impacts in improving service p quality with customers.

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SOCIAL MEDIA

Social media refers to activities, practices ,and behaviors between communities of people who gather and share online information and opinions using conversational media (Safako & Brake, 2009). social media relates to the sharing of information, experiences, and perspectives throughout community-oriented websites. Social media are new web technologies which have made it easy for everyone to create and distribute their own content (Zarrella, 2010). Social media is characterized by participation, openness, conversation, community, and connectedness (Mayfield, 2008). Social media is becoming an integral part of life online as social websites and applications proliferate. Most traditional online media include social components, such as comment fields for users. In business, social media is used to market products, promote brands, connect to current customers and foster new business.

SOCIAL MEDIA MARKETING

Marketing activities aim taken at building and maintaining desirable exchange relationships with target audiences invaliding a product, service or other object (Kotler,2008). Companies have made marketing expenses to increase their presence there (Boyd, Ellison 2008). In order to succeed; companies need to adapt their marketing strategies with the right communication and promotion tools. Recently, Social media became more effective, because they served the needs of the customer. Social media became increasingly popular over the last years, and because of this popularity, the traditional Media have experienced decline in marketing. Traditional media like newspapers or TV are one way technologies and static broadcast technologies, approaches to social media marketing are different. Nevertheless, in order for companies to achieve a coherent and successful strategy, they should strive to integrate their message across all social media channels (Zarrella, 2010) .While with traditional marketing communication, companies where able to talk to the customers, social media has made it possible for customers talking to each other (Mangold, Faulds 2009).People are spending most of their time on the internet especially on social networking sites (Todi, 2008), which gives the companies great opportunity to shift from traditional media (TV, radio) into more effective online social media. Main stream media channels have faced many challenges and are facing down turn in their profits levels (Palmer and Lewis, 2009). This is directly partially linked to the rise of social media in marketing and brand management. As a result of economic pressure, companies have tightened their budgets and shifted to online channels. The social media marketing empowers individuals and companies to promote

their websites, products or services through online social channels and to communicate with a much larger community that may not have been available via traditional advertising channels (Weinberg, 2009). Mangold and Faulds (2009) indicated that customers engaged with a product, service are more likely to communicate through social media. Customers are more likely to talk about companies and products when they feel they know a lot about them. Weber (2009) clarifies that the objective of new marketing is community and engagement. They avoid traditional media like print advertisements by turning the page, etc. social media marketing objective is to get customers invite companies to deliver them the message instead of forcing messages to them. Marketing through Facebook Facebook is one of the leading and rapidly growing online networks. With over billion users, Facebook becomes an important marketing place for marketers these days. Facebook enables companies to use many services for contacting and communicating with their customers. One of the interesting tool for companies is customers Fan pages. Typical characteristics of fans are self identification as fan, emotional engagement, cultural competence, auxiliary consumption, and co-production (Kozinets et al., 2010). The internet has made it possible to overcome geographical restrictions and to build fan communities worldwide. Practically, users become fans of a Facebook fan page by pressing the "like-button," which indicates that they like this brand; this preference is then added to their profiles. By creating a Facebook page, company creates a common platform for their customers, friends or partners to engage them in conversation arena within company and product. On the fan page, company can put all its information, introduce product, and encourage customers for providing comments and feedbacks . Facebook itself posted five guiding principles of Marketing on Facebook (Facebook, 2013). They are: developing a strategy that is social, creating consistent and an authentic brand voice, create content that people like and are ready to pass each other, building relationships by staying in touch with them and rewarding through deals and promotions, and evaluating feedbacks and comments, and knowing what your costumers like most.

SOCIAL MEDIA MARKETING AND SERVICE QUALITY

Quality is a central concept in the field of Relationship Marketing . According to Phillip Kotler et al (1999), service is any action or assistance that one party can offer to another party that is fundamentally intangibility and inseparability. Cannon (1998), expressed services as those separately identified, essentially intangible actions which offer satisfaction and which are not necessarily tied to the sales of a product or another service. According to Palmer (2000), described that services are products which are principally intangible and cannot be owned by any customer. McCarthy and Perreault (1993), defined service as a act performed by one party for another. From the above definitions as presented by the various experts, it is clear that they all highlighting that service is essentially intangible, heterogeneity, perish-ability and inseparability. This means that a service cannot be seen physical but the customer experiences it. The idea of service therefore is focused on the intangibility element and which essentially provides want satisfaction to the customer.

From the viewpoint of service provider service quality is an achievement in customer service and from the view point of customer Service quality is a measure of how well the service level delivered matches customer expectations. By providing Superior product/service quality relative to competitors is the single most important factor affecting profitability of any organization. Pirsig, 1987; "Quality is fitness for use, the extent to which

the product successfully serves the purpose of the user during usage" Juran, 1974; "Quality is zero defects - doing it right the first time", Parasuraman, Zeithaml and Berry, 1985; "Quality is exceeding what customers expect from the service".

This concept of service quality has its origin in the expectancy-disconfirmation paradigm which is a cognitive theory which seeks to explain post-purchase or post-adoption satisfaction as a function of expectations, perceived performance, and disconfirmation of beliefs which was developed by Richard L. Oliver. In line with these previous literature, this study focuses on customer satisfaction, trust, and commitment as key characteristics for measuring relationship quality. This study assumes relationship quality as a higher order construct consisting of three distinct yet related components: trust, satisfaction and commitment. Furthermore, users of social media now are highly motivated web consumers. As exposed by Nielsen?s (2011), State of the Media: Social Media reports that 70% of social media users are engaged in online shopping (Nielsen, 2011). Consumers easily get what they want just by sitting in front of computer screen and accessing online websites. Though social media marketing has huge benefits on consumers and marketers, at the same time it has negative impacts on both of them. Due to its easy way of getting access to information, lack of monitoring and control, undoubtedly it favors many risks and cyber crimes. In the coming chapters we will be discussing about advantages and disadvantages of social media marketing in further detail.Cronin and Taylor (1992), said that the purchase intention of the customers in the retail banking industry depend on the customer satisfaction. In addition, the study examines the differences in service quality satisfaction and its impact on the behavioral intentions of customers and to make recommendation to enhance customer satisfaction in banking industry in general. Heskett et. all. (1997) believed that the high quality of service believed to be influenced by customer value and customer satisfaction, again the customer satisfaction directly influence the customer loyalty. *Cronin and Taylor (1992)*, said that the purchase intention of the customers in the retail banking industry depend on the customer satisfaction. In this ICT (Information, Communication and Technology) era, the mode of banking system has been changed and direct pay, online financial services has gained value. Now a day, customers need flexible hours of operation, customization and transparency. Due to increased market competition, customers' defection rates are higher. Thus, research on service quality and satisfaction of customers in banking sector is considered important.The literature review on service quality and customer satisfaction in banking services reflects the findings of various professionals and researchers. With a view to authenticate the study, various literatures have been reviewed to identify the research gaps. Customer Loyalty explains the association between the comparative outlook toward an service provider and patronage behavior of customer. Customer's Loyalty involves a emotional bond to the service provider and means you are at a certain high degree of customer satisfaction and commitment. **Parasurman et al., (1988)**: The SERVQUAL model is one of the important and usually used tools to measure service quality and consists of five dimensions: tangibles, reliability, responsiveness, assurance, and empathy. **Cronin and Taylor (1992)**: proposed the SERVPERF model, which considers only actual performance and, thus, eliminates the expectation component present in the SERVQUAL model. According to **Asubonteng et al**., service quality is the difference between the customer expectations for service performance prior to the service encounter and their perceptions of the after the service received. **Gefan (2002):** defined service quality as the prejudiced relationship that

customers make between the quality of the service that they want to receive and what they actually get.

SERVICE QUALITY AND CUSTOMER SATISFACTION

Customer satisfaction is a part of customers experience that exposes a suppliers behavior on customers expectation and most important in today's cut throat completion because it affords marketers and business owners with a metric that they can use to manage and improve their services of business to satisfy their existing customer and forthcoming customers. Customer satisfaction is the measure of how the desires of customer and its reactions are cooperate with each other and transmit to outperform customer's expectation. It can only be attained if the customer has an overall good relationship with the supplier. Higher the satisfaction level, higher is the psychological attachment of customers with the particular brand or product and also with the service provider. These benefits in making a strong and healthy customer-service provider bonding. The SERVQUAL Model is an empiric model by Zeithaml, Parasuraman and Berry to contrast service quality performance with customer service quality needs. It is used to do a gap analysis of an organization's service quality performance against the service quality needs of its customers. That's why it's also called the GAP model. It takes into account the perceptions of customers of the relative importance of service attributes. This allows an organization to prioritize.

OBJECTIVES AND RESEARCH METHODOLOGY

Present Research work has been taken up with the objectives

- To analyse social media marketing in influencing customer behavior towards banking services .
- To analyse social media marketing and its role in improving services qualities and enhancing brand loyalty of customers.

Data for the present study was collected from Indian consumers using an online survey developed on Google Forms in March and April, 2016. Consumers were invited to participate in the study through email and by posting invitations to well-know sites asking potential respondents to visit the website to complete the questionnaire. Online surveys are now common research instruments as they enable quick transmission and fast turnaround as well as significant cost benefits (Wilson and Laskey, 2003). A total of 151 consumers participated in the study, with a final valid 133 questionnaire being used in this study, excluding 18 responses that were unreliable or insincerely answered. The existing literature helped in the preparation of the questionnaire and questions were selected based on related studies. Questionnaire was framed on the dimension of social media marketing and consumer behavior ,   therefore, they are many questions subjected to indivduals' beliefs, and attitudes, which are expressed in the form of scale questions. Considering the matter of subjectivity, the use of close questions was critical in order to allow statistical conclusions to be made in a relatively objective manner; likewise, a few open-ended questions allow individuals to develop own responses, and may reveal attitudes or facts (Grummit 1980). Dimension of service quality were identified as reliability, responsiveness, competence, access, courtesy, communication, credibility, security, competence, understanding the customer and tangibles(Parasuraman et al.)   Based on these five

dimensions listed above, the researchers developed the construct for the study. Some questions were then modified by the researchers in order to focus on specific information.

The survey questionnaire consisted of two sections. The first section of the questionnaire contained questions to examine surveyed consumers' demographic profile. The second section of the questionnaire was concerned with various factors related to social media marketing, services quality and brand loyalty in a five-point Likert-scale ranging from 1 (strongly disagree) to 5 (strongly agree). Out of 15 attributes, six were related to social media marketing, 3 were related to service quality and 6 were related to brand loyalty. To assure the validity of survey instrument, the initial questionnaire was given to a panel of experts and faculty members to judge its content's validity, the clarity of its items meaning and to assure its linkages with the study objectives. In order to validate the reliability, the questionnaire was pilot tested using 25 respondents, representing 16% of the total sample size, who were considered the representatives of the study population. The value of Cronbach's alpha was found 0.734, which suggested the acceptable level of reliability of the questionnaire. The data thus received was systematically arranged, tabulated and analyzed using SPSS 22. Data analysis involves descriptive statistics using SPSS 22 and regression analysis to assess the impact of SMM on Service quality and brand loyalty of customers.

Table-1 : Demographic Characteristics of Respondents

	Categories	Count	Percentage
Age	Up to 20 years		
	20 to 30 years		
	30 to 40 years	29	21.8
	40 to 50 years	56	42.1
	50 to 60 years	32	24.1
		14	10.5
		2	1.5
Gender	Male	81	60.9
	Female	52	39.1
Marital Status	Married	73	54.9
	Unmarried	60	45.1
Occupational categories	Business	50	37.6
	Serviceman	35	26.3
	Housewives	18	13.5
	Professional	20	15.0
	others	10	7.5
Educational Level	Matric and Below	39	29.3
	Under Graduate	17	12.8
	Graduate	25	18.8
	Post graduate	34	25.6
	Professional and Others	18	13.5

Demographic information of customer are the important factors influencing customer behavior. A marketer needs demographics to identify the ideal consumer for his product or services and develop marketing strategies such as product packaging, advertisements, business location and pricing and enhancing brand loyalties. Analysis age categories of the population shows that 21.8% of the population falls in the age upto 20 years. 42.1% respondents are in the age goup of 20-30 years of age. 24.1% respondents falls in the age group of 30-40 years.   10.5% respondents is between the age of 40-50 years. Remaining 1.5% respondents are in the age group of 50-60 years The sample comprises of 81 male respondents and 52 female respondents. The sample is dominated with married (54.9%) of respondents and 45.1% respondents are unmarried. The information related to occupational categories of respondents indicates that sample is dominated by business class respondents as 37.6% respondents falls in this group. 26.3% respondents belong to service class respondents. 15% respondents were from professional categories. 13.5% respondents are housewives and 7.5 % respondents falls into other categories respondents. It is observed that sample is the combination og good educationally qualified respondents as almost 58% respondents are either graduate , or post graduate or having professional education qualification to their credit.

Table 2: Nature Banks with whom customer is having Account

		Frequency	Percent	Valid Percent	Cumulative	Percent
Valid	Public Sector Bank	84	63.2	63.2	63.2
	Private Sector Bank	26	19.5	19.5	82.7
	Foreign bank	4	3.0	3.0	85.7
	All	19	14.3	14.3	100.0
	Total	133	100.0	100.0	

Social media marketing has emerged as one of the important marketing media to promote product. Today, both private and public sector banks in India have established a social media fan following that matches that of their global peers. The social media enables them to be a part of the lives of their consumers by initiating conversations beyond business. With this into consideration, respondents were classified as the nature of bank they are having account. It is observed that 63.2% respondents indicated that they are having account with public sector bank. 19.5% respondents indicated that they are having account with private sector banks. 3% indicated that they are having account with foreign banks. And 14.3% respondents indicated that they are having account with all categories banks.

Table 3: Account with No of Banks

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Only one	11	8.3	8.3	8.3
	Upto 2 Banks	74	55.6	55.6	63.9
	Upto 4 banks	45	33.8	33.8	97.7
	More than 4 Banks	3	2.3	2.3	100.0
	Total	133	100.0	100.0	

At the heart of a perfect strategy is the creation of mutual value for all parties involved in the business process. It is about creating a sustainable competitive advantage by being the best at understanding, communicating, delivering and developing existing customer relationships in addition to creating and keeping new customers. Some people seem to think that just because they have an account at a particular bank, they need to do all of their banking business with that specific bank. While having a bank that offers good customer service and that meets all of your banking needs is great, if you don't have a bank that offers these perks then there is no specific reason for you to give them all of your business. You might find that your financial and banking needs are best met by opening different accounts at different banks, choosing the banks for their strengths with certain types of accounts. Keeping this into consideration, an attempt was made to know the number of banks customer is having his account at present. The information in this respect indicates that more than half of the respondents in the sample hold their account with two banks as it was indicated by 54.8 % respondents in the sample. 38.6% respondents indicated that they are having account with different bank ranging upto four. 5.6% respondents indicated that they are having only one account with bank. Less than one percent respondents revealed that they are having bank account in more than four banks. This signifies that sample is dominated by those respondents who are having accounts with different banks.

Table 4: Duration of account

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than Two Years	20	15.0	15.0	15.0
	2to 4 Years	10	7.5	7.5	22.6
	4 to 10 Years	31	23.3	23.3	45.9
	10 to 15 years	33	24.8	24.8	70.7
	More than 15 years	39	29.3	29.3	100.0
	Total	133	100.0	100.0	

INFERENCE:

An attempt was made to know the duration of relationship which customer hold with the bank. To know about these question was asked what is the longest duration of relationship you have had with any bank. Analysis indicates that more than half of the respondents hold the relationship with bank since last ten years and above as it was indicated by 56.7% respondents in the sample. 22.4% respondents indicated that they maintains account from 4 to 10 years. upto 15 years. 9% respondents are having account from last 2 to four years. Remaining 11.8% respondents maintained relationship with bank since last two years.

Table 5: Social Media Marketing and its Relationship with Services Quality and Brand Loyalty: A Descriptive Statistics

	Reliability	Mean	Std. Deviation
Social Media Marketing	.715	2.7531	.41164
The social media page is attractive		3.9624	.91623
the social media page is very information in providing product information		3.6316	.89166
The social media page is reliable in providing information of he product		3.4211	1.13625
Information provided on social media trustworthy.		1.9925	.43513
The information of product on social media is entertaining		1.5489	.59628
Social media marketing encourages me to interact.		1.9624	.72201
Service Quality	.606	4.0075	.45775
Bank employees are always willing to help to customers on social media		3.3383	.90359
Employees provides prompt services through Social media to its customer.		4.3684	.69056
Employees handle requests/complaints promptly		4.3158	.67833
Brand Loyalty	.701	3.6278	.46867
I consider myself loyal to my bank		4.1805	.84239
This bank will be my first choice in the future.		4.3684	.69056
My present banks really attracted me over other banks		3.6316	.89166
Banks employees and their approach is trying to engage customers' lives.		3.9850	.89599
Banks employees are s quite thoughtful in every aspect.		2.7895	.56478
I will definitely remain with present bank		2.8120	.68700
Valid N (listwise)			

Descriptive statistics presented in the table indicates that mean , standard deviation and relaiblity statistics (α) of various Social media marketing practices, services quality and variables of brand loyalty. It is observed that reliability (α) of different variable of social media marketing is .715, service quality is .606 and brand loyalty is .701. descriptive statistics presented in the above table indicates that mean of variable like social media page is attractive has scored highest mean of 3.9624 followed by the social media page is very information in providing product information which has scored mean of 3.6316. enhances the employees commitment as it scored highest mean of 4.0160 followed by operational efficiency with mean 3.7292. High standard deviation (1.13625) of the variable like The social media page is reliable in providing information of the product indicated that respondents view on this issue is heterogeneous.

Similarly, the real time information like Employees provides prompt services through Social media to its customer has scored highest mean of 4.36. information related to different

variable related to brand loyalty of customer   indicates that out of various variable the variable like "I consider myself loyal to my bank" has scored highest mean of 4.18.5. highest SD of variable like " Banks employees and their approach . is trying to engage customers' lives" indicates that respondents view on this issue is heterogeneous

Further regression analysis was carried out to assess the impact of social media marketing Practices and itsimpact on improving service quality and brand loyalty of customers.

REGRESSION ANALYSIS

Regression analysis is used to model the relationship between a response variable and one or more predictor variables. regression analysis helps one understand how the typical value of the dependent variable (or 'criterion variable') changes when any one of the independent variables is varied, while the other independent variables are held fixed. Regression analysis is a way of mathematically sorting out which of those variables does indeed have an impact. The important outcome of the regression analysis is presented in the table below

Table 6: Regression Analysis

Dependent Variable : Service Quality			
Independent Variable: Social Media Marketing Practices	Beta	t- Value	P Value
	.625	7.769	.000
R= . .562ª R² .315 F= 60.359 P=.000 Std. Error of the Estimate =.38018			
Dependent Variable: Brand Loyalty			
Independent Variable: Social Media Marketing Practices	Beta	t- Value	P Value
	.606	8.405	.000
R= .592ª R² .350 F= 70.637 P=.000 Std. Error of the Estimate = .37920			
Dependent Variable: Brand Loyalty			
Independent Variable: SMM practices & Service Quality	Beta	t- Value	P Value
	1.009	25.019	.000
	.096	2.653	.000
R= . .954ª R² .888 F= 516.771 P=.000 Std. Error of the Estimate = .15786			

Inference:

In order to build strong communication among existing and potential customers, businesses use social media   to facilitate online interactions and consistently increase consumer active engagement and thus improving the service quality and brand loyalty. With the help of regression analysis an attempt was made to know the   relationship between social media marketing practices and its impact on service quality , SMM and its relationship with Brand Loyalty and further combined effect of SMM practices and service quality on brand loyalty of customers. The value of R square is .315 indicates that SMM practices   explain31.5% variance in service quality. The relationship between SMM   as independent variable and services quality   as dependent variable is indicated by standardized coefficient beta with a value of .625.The significance of beta is tested using t-test and value found is 7.769 which is significant at 0 level of significance indicating positive

relationship between SMM Practices and Quality of services . further relationship between SMM Practices and its impact on brand loyalty was tested using regression analysis. The value of R square is .350 indicates that SMM practices explain 35% variance in the brand loyalty. The relationship between SMM practices as independent variable and Brand Loyalty as dependent variable is indicated by standardized coefficient beta with a value of .606. The significance of beta is tested using t-test and value found is 8.405 which is significant at 0 level of significance indicating positive relationship between SMM practices and Brand loyalty of customer .

The regression analysis of combined effect of SMM practices and quality of services brand loyalty was tested. The result indicates that the value of R square is ..888 indicates that combined effect of smm practices and services quality explain 88.5% variance in improving Brand loyalty. The relationship between combined effect of SMM practices and Services quality as independent variable and brand loyalty as dependent variable is indicated by standardized coefficient beta with a value of 1.009 and .096. The significance of beta is tested using t-test and value found is 25.019 and 2.653 which is significant at 0 level of significance indicating strong positive relationship of combined effect of SMM practices and service quality on brand loyalty. The significant improvement in the R2 indicates that SMM practices mediates between Service quality and Brand loyalty and thus supports the hypothesis.

The value of F is found to be 516.771. The p-value associated with this F value which is .000 is lower than 0.05(alpha value). In additions, Thus it implies that there is significant impact of the independent variable (SMM practices) on the dependent variable (Brand loyalty) and the model applied is significantly predict the dependent variable.

DISCUSSION AND CONCLUSION

In the present economic environment, the social media has emerged as one of the most powerful tool and become more capable in servicing customers. For making it application into more wider, its potential in customer service has to be strengthen. This study was aimed at providing new information regarding the variables social media marketing and service quality and their interaction and effect on brand loyalty. The study confirms the result of the previous study done by Gilbert and Wong (2003). In line with previous result , present study also confirms that greaer involvement in social media marketing bring improvement in the service quality and certainly had a positive effect on brand loyalty. This study expands the understanding of brand loyalty towards an bank when consumers are facing varying levels of social media marketing and service quality. It enhances the idea that using social media marketing is definitely a necessary tool for banks looking to increase their customers' brand loyalty. Social media is possibly the most powerful customer service tool today. While scholarly research is divided on the importance of social media as an alternative channel of distribution, marketing executives believe that social media channels are superior in performance in terms of complaint handling and implementing multiple channels. Our findings indicate that any increase in customer effort with respect to complaint handling in social media might substantially reduce satisfaction as compared to traditional media. Moreover, social media act as vehicles of communication media, and this need to be applied very cautious way to influence and attract the customer to its offers.

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COMPARATIVE ANALYSIS USING MACHINE LEARNING MODELS TO EVALUATE EMPLOYEES ATTRITION FACTORS

ABSTRACT

Employee's attrition is the challenging problem organizations face these days.There are various factors influencing high attrition in organizations. This study includes the detailed analysis of such factors and consequently validates the study by using machine learning models. The two widely used machine learning techniques namely: SVM and logistic regression has been used. These techniques have been applied to the dataset to predict the attrition rate based on known features. The accuracy obtained by both these models is compared and reason for underperformance is discussed thoroughly.

KEYWORDS-Attrition, Support Vector Machine, Logistic regression, turnover

INTRODUCTION

In today's fast moving world and changing scenarios, industries are constantly working for the better prominence and looking to get competitive edge over competitors. Organization need to understand the relevance of retention of seasoned employee. Employees are the important asset of the organization so organizations need to focus upon HR practices and adopt latest technologies and methodologies to have knowledge of the know-how of the employee and the trend analysis of the employee leaving the organization. Many companies are facing the intense pressure of hiring and retaining professionals and simultaneously to compensate the loss of talent occurred due to voluntary employee turnover. Loosing talented employees leads to decreased performance, low productivity and tarnished reputation of the organization as a whole, Goswami and Jha (2012). It is the responsibility of the organization to resolve the various issues and problems faced by the employee pertaining to the job and work environment and culture. Employee Attrition is becoming a serious bottleneck. Earlier times employee used to be more stagnant devoted a great amount of time period to a single organization but now time has changed drastically so the movement and switching of the jobs by the new aged employees. The problem can be tackled firstly by identification of the reasons and then by reengineering the Human Resource(HR) interventions. Till certain level attrition cannot be totally eradicated but can be controlled and monitored, NappinnaiandPremavathy(2013).

The machine learning techniques used in this paper for analysis part are: Logistic regression and Support Vector Machine (SVM). Logistic regression is a kind of classification problem that falls under the category of supervised machine learning. It measures the relationship between the features and based on them make predictions. The dataset used in this paper has quantifiable attributes that can be analyzed using logistic regression model using machine learning. Another model is SVM machine learning is used

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for both binary and multi-class classification,Bolón-Canedo et al (2011), Shiltonet al (2013), Kaur et. al (2018a, 2018b) . It makes a hyperplane to best classify the classes based on related characteristics. Its classification can either be one versus one or one versus rest,Yukinawa (2009). However, one versus one technique has been used in this paper.These models can also be used to solve other problems such as predicting land prices, network traffic classification, finding denial of service attacks etc. Chauhan et al (2018). Section II covers the meaning, definition and factors influencing attrition. Methodology is provided in Section III. Section IV displays the methodology for data analysis and section V elaborates results and discussion part. The conclusion is provided in Section VI.

EMPLOYEES ATTRITION AND TURNOVER

Employee attrition can be defined as the disconnection of the employees' relation with employer due to any cause of separation. This separation cause can be voluntary or involuntary andgenerally not replaced by the employer. Voluntary separation is called when the employee separates from the form the organization deliberately. Involuntary Separation is when employee departs from the organization either being fired, retirement or death. Voluntary Attrition is not the main uprising challenge for which the organization has to gear up start preparing solid robust techniques to shield themselves. Attrition affects adversely in the long run. It highlights the poor implication HR procedures in the organization. It increases cost to company and thus customers and finances get influenced to greater extend,Augustin andMohanty(2012). Sometimes the attrition is also named as turnover or churn rate. The general formula to calculate attrition rate is given in equation (1).

Employee's attrition may be affected widely due to various factors but not limited to as shown in fig. 1. Career Progression: Though many actions are showcased but the growth rate and planning is nonexistent or very slow. Appraisal Process: the process should be performance based, periodically and transparent. HR department should utilize early warning system, for example RAG analysis (red, amber and green) to find employees who are may leave or continue.Health Issues: long travel hours and extended working hours have increased the attrition rate. Stress and unhealthy eating habits have led to the various health problems in present employees. A study showed that various indoor and outdoor factors have effect on human heath mainly on the respiratory parameters, Aggarwal et al (2010), Awasthi et al (2017). The heath factor also includes the mental health of employees, Rao and Subbarayudu (2017).   Salary: It is one the highest reason due to which people switch. It is the vital component which retain or motivates an employee.Timings: Strict timings bounds employees especially when timings are off the beat. Also frequency and

duration of the breaks also adds to the component. Job designation: Monotonous environment, same tasks for long time and no up-gradation in skills leads to dissatisfaction with in employees. Thus, regular training and development and job rotation could be practiced by the management.

Figure 1: Employee Attrition Factors
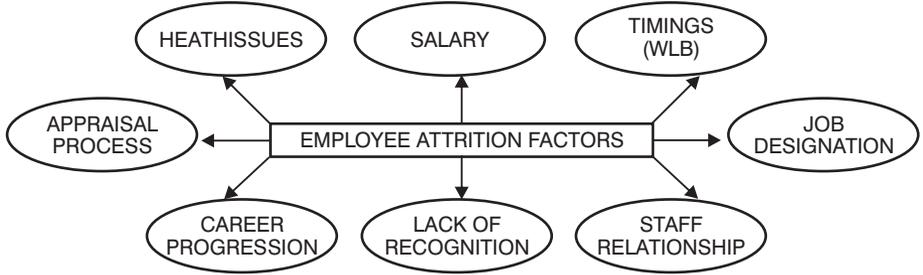
FIGURE 2, SHOWS THE FACTORS THAT CAN MINIMIZE THE EMPLOYEE'S TURNOVER RATE. IF AN EMPLOYEE IS PROVIDED PROPER TRAINING PRIOR TO START OF PROJECT THEN THE OUTCOME MAY INCREASE SUBSTANTIALLY. IT IS THE COMPANY'S OBJECTIVE TO RECRUIT SUITABLE EMPLOYEES' IN ORDER TO REDUCE LATER TURNOVER. THE ORGANIZATION MUST FOLLOW THE PRACTICE TO RETAINING THE VALUABLE EMPLOYEES OF THE COMPANY. SARADHI AND PALSHIKAR (2011) HAVE DEVELOPED A MODEL TO CHURN THE VALUABLE EMPLOYEES'.

Figure 2: Factorsminimizing Employees Turnover
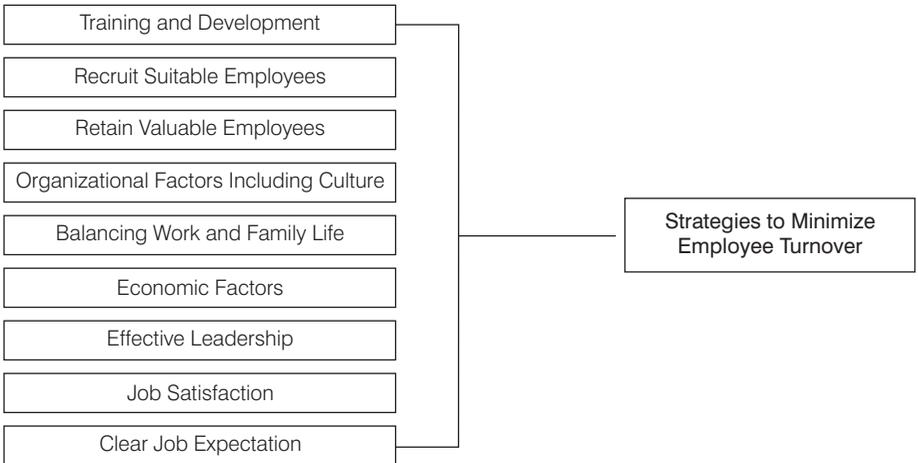
There must be a good interpersonal relationship between superior and subordinate in the organization. This factor can act as low churning rate for the organization.

LITERATURE REVIEW

Hammerberg(2002) in his study in retail industry founded that greater number of employees left the organization due to job-related reasons that too given by the employees who had been employed 12 months or longer. Out of them major reasons for leaving included the employees expressed dissatisfaction with working in the retail industry, dissatisfaction with their salary and having obtained better employment in retailing. Author concluded that these reason are mainly under the control of employer. Also earlier research work shows that the cost incurred by losing a valuable worker and training a newly hired can be at least be equal to1.5 times the salary , may be more by consideration other constraints, of the preexisting employee. So management need to learn that how turnover of knowledgeable, skilled and experienced employee can be minimized.

With reference to Pandey and Kaur(2011) the figure 1 illustrated the key factors for employee attrition in Indian call centers. The authors have concluded that these factors haveled to drastic increase in the employee attrition rate working in ITeS (Information Technology Enabled Services). It has become an alarming situation for the management and they should come up with relevant and better HR interventions. Increased rate of attrition not only impacts the profitability of the organization in long run but also demoralizes other working people. It is now imperative for the management to search that how can they satisfy expectation of their employees form the company. A transparent work culture, career development programs, a better employee job-fit, unambiguous appraisal procedures and competitive compensation would greatly help in the retention of the good performers within the organization.

Saradhiand Palshikar (2011) have showed analysis on two aspects i.e. employee churning and customer churn. They have used a simple value model that can predict the churned employees who were valuable to the organization that already left that organization. They studied the adverse effects of employee's attrition and concluded that recruitment of new employee's is time taking and efforts process that cannot even ensure the same level of expertise and productivity for newly recruited employees.

Goswami and Jha (2012) has found some factors for the employee turnover which were salary levels, lack of career mobility and challenges, working environment , More stress and Work Life Imbalance, Lack of   proper Supervision, Lack of Employee-job fit; Non-intergeration of new joiners; Goals are non-realistic and Vague; Role Ambiguity; Improper Feedback mechanism. The author puts the responsibility on the HRD to formulated the exhaustive HR processes and the recommendation from experts. Author found that high compensation is not only the element which could satisfy the employee. The organization need to construct cordial job environment and give a buoyant opportunity for career advancement for dedicated employees. Author focuses on indulgence of employees in decision-making, robust feedback mechanism.In study emphasizes on the importance of to know the attrition can be minimized to the fullest. Industries need to create a sphere where there is promising career enhancement, recognition for the better task performers and atmosphere where the employee feels belongingness.

Augustin and Mohanty (2012) have identified that the causes that maneuvers employee satisfaction and constant commitment, to the great extent , is under direct manager's command which covers rewards, appreciation and giving feedback, platform to grow and get trained, unbiased allowance and remuneration showcasing an employee's

contribution, a pleasant work culture and career growth. Author studied the various factors for unintended employee's departures. Author has founded that according to Reed Consulting Report (2004) the main reason for attrition are less opportunities for career and personal growth, problems with working relationships, benefits and compensation. The study concluded that career progression of employee had come up as the major reason of attrition. Author has postulated career progression as inclusive of elements as individual capability level, innovative work practices, performance rating related to on-the-job performance, potential rating on the competency scale for the next level job. HR Department need critically study all these elements and construct a robust system for the employee's career progression. This would create the feeling of belongingness and synergize the organization's goal with personal goal.

Arokiasamy (2013) concluded that there are various factors affecting the employee attrition within organization include: Job Satisfaction, Pay, Career Promotion, Management, Fringe Benefits, Personality, Job Fit, Perceived Alternative Employment Opportunity, Unionization, Influence of Co-Workers also shown in fig. 2. Job satisfaction affects majorly on employee's turnover. Author emphasizes on the retention of employees at all cost so he has recommended management to study these factors. He has also showcased some strategies which could decrease the employee turnover rate.

Vnou?ková and Klupáková (2013) studied 5 motivational principlesnamely Inspiring and positive leader, caring work culture, to create and to share strategies, goals and tasks; Transparent Communication system; Unbiased awards and rewards. These principles can deeply affect Employee Turnover.The author concluded that the turnover can be reduced by changing the working style of the organization by giving some sense of freedom, career progression pathways, openness for the communication and free flow of sharing of ideas and feelings. The need of an employee should not be overlooked rather they should be taken care of by generating the feeling of being important to the organization. Employee encouragement could be given in order to not only increase the personal satisfaction but also the overall growth of the organization. Taking care of Training and development of the employees, helping in the career growth, Sharing information and place for open communication, appreciation and compensation as and when required, encouraging friendly and good cultural environment and focus on right recruitment all these if taken into consideration can lead to lower employee attrition.

Alao and Adeyemo (2013) showed the serious consequences of employee's attrition where movement of organizational intellectuals are concerned. The authors have applied the decision tree algorithms for carrying out the analysis. The two main features namely demographic and job type were taken into account while analysis.

N.Silpa (2015) founded in the study that lack of career growth opportunity was the main cause of employee attrition. The other factors playing important role concluded by the study are the job was below employee expectations, Non-supportive supervisors, Lack of employee skills, Unpleasant work place, dearth of training, Work-Life Imbalance. The author has suggested that industry should give a platform to the employees for their overall personality and career growth through various means like providing latest training and development programs, assigning more challenging work and letting employees to be a part of decision making process. By giving better fringe and monetary benefits as per the performance levels, promising employees' can be retained for longer duration and motivation is also high.

Dube and Verma (2015) studied the attrition causes for IT and Pharmacy industry and various were factors taken into consideration. The study identified that 60% of the people change due to 4 important reasons career growth, pay, brand and work culture. Family reasons, social concern, community and culture bond have also played role in the increase of attrition of employees. Author concluded that time to time incentives as per the target acheived, trainings for the professional and personal enrichment and motivational initiatives can help to reduce attrition rate. As it was observed in the study that female employees change job basically due to their spouse relocation so the study has recommended that through posting and transferring internally, companies can check if the relocation requirements could be met for the existing employees.

Sundararajan (2016) founded in his study on service industry that the most important reasons of the attrition were:-Less payment; High Work Load; High External pressure; Working timings was not satisfactory; Stressful working conditions and No work-life balance. Author concluded that the competitive compensation, changes in working timings, processes to improve work-life balance can increase the employee retention. Also the factors which affect employee attrition as requested by employee are career growth opportunity and challenging job structure. Not only pay structure is the main factor of attrition but job security is important too and better working conditions is also a considerable factor. Employee starts getting bored if new challenging environment is not thrown to him periodically and also if they are not able to learn and grow thus regular new trainings and development programs be conducted for personal and organizational goals.

Punnoose and Ajit (2016) through his literature studies founded that the main predictors of voluntary turnover were tenure, age, salary, job contentment, fairness that employee perceives, working conditions, ethnicity, supervision, growth, rewards, progression, burnout. Increased turnover has very damaging effects on the company's long term growth. Replacement of the skilled or expert employee is an exhausting task. It influences the productivity and profitability of the organization. Obtaining new workforce as replacement induces cost such as for hiring and training majorly. Also new employees take time to get accustomed to new techniques and environment and will take particular duration to reach up to the expected quality performance level. The authors have used Extreme Gradient Boosting machine learning technique to predict employee's retention in the organization. The authors have focused on measures for maximizing the retention rate as more employee turnover leads to adverse effects on productivity and organizational growth

Zhou et al (2016) used clustering technique which is an unsupervised machine learning technique for analyzing the problem of employee attrition. The authors in their paper tried to build a generalized model that can be applied in different agencies or areas where attrition is the major concern.

Rao and Subbarayudu (2017) showcased nine elements that lead to employee attrition in his study which was specific to BPO industry. According to study the underlying reason for the attrition rate especially in Indian BPO industry are: Improper recognition of work ; Health hazards for continuous phone; Mental strain due to continuous arguments with the customers; Work life imbalance; Monotonous work; Lack of career growth and opportunity; Salary and working conditions; Meeting targets; Job security and growth. The study has suggested that to decrease the attrition the HR in the industry needs to analyze these nine areas and to work upon to stabilize the employee turnover.

METHODOLOGY

The basic approach for analysing data using machine learning models has been used. There are four phases: Data selection, data preprocessing, data analysis and results. In the first phase, the employee's dataset has been selected from an online repository IBM Dataset. This is a labelled dataset consisting of 34 attributes and 1470 records. In the second phase, the data has been cleaned i.e. missing entries has been imputed. In third phase of data analysis, two famous machine learning techniques namely: SVM and Logistic regression has been used. In the fourth phase, the results obtained are evaluated by measuring their accuracy. The fig. 3 shows the pictorial representation of aforementioned four steps.

Figure 3: Methodology for Data Analysis
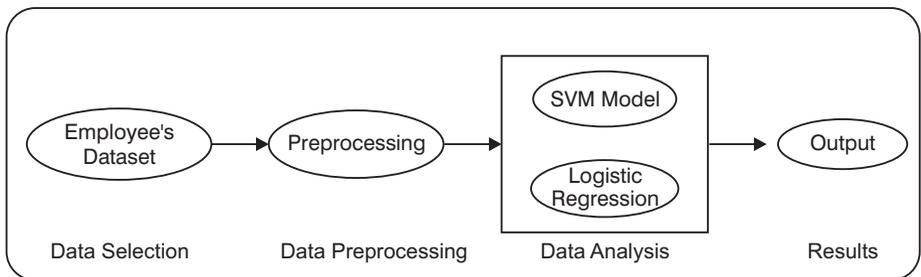
The accuracy (α) is measured using the general formula shown in equation (2), Powers (2011), Bamakan (2016).

Here tp, tn, fp and fn represents true positive, true negative, false positive and false negative respectively. The tp is the total number of instances that are correctly classified; tn are total number of instances are correctly classified as not belonging to that class; fpare the instances incorrectly classified that belong to another class, and fnare the total number of instances wrongly classified as not belonging to a particular class. The

The F1-score also know and F1-measure is also calculated using the formula shown in equation (3), Power (2011), Bamakan (2016). It is the measure of implemented model's test accuracy. The range of values obtained using F1-measure lies between 1~0.

$$F1 - measure = 2 * \left(\frac{\frac{tp}{(tp + fp)} \cdot tp}{\frac{tp}{(tp + fp)} \cdot tp} \right)$$

RESULT AND DISCUSSION

This section includes the detailed analysis of results obtained using SVM and Logistic regression models. The overall accuracy obtained in determining the attrition rate of

employee's using SVM model is 84.1%. However, Logistic regression models has outperformed in determining the employee's attrition rate with 88.1% accuracy. The confusion matrix obtained using both the models are shown in table I.

Table I. Confusion Matrix Obtained Using SVM and Linear Regression Model

Confusion matrix (SVM)		Predicted No	Yes	Confusion matrix (Logistic Regression)		Predicted No	Yes
Actual	No	TN=1140	FP=93	Actual	No	TN=1198	FP=35
	Yes	FN=137	TP=100		Yes	FN=150	TP=87

The F1-measure values are also obtained using SVM and Logistic regression model is 0.465 and 0.526 respectively. It has been found that certain features showed high correlation while evaluating the results. Chi square (x^2) values of all features are obtained range between 63.84 ~ 0.008. The two features named: overtime and job-level scored highest values of 63.84 and 44.66 respectively using ?2 method. The association between these two features is shown in fig. 4.

Figure 4. Effect on Employee Attrition Rate Based on Two Features: Job Level and Overtime.
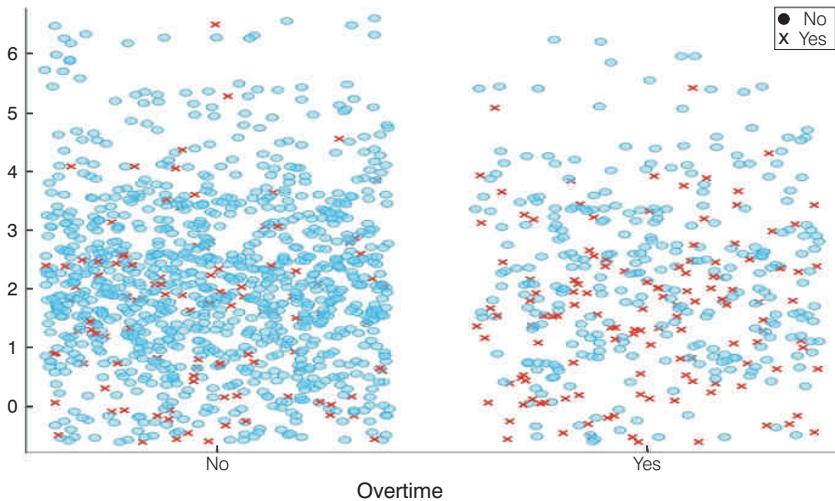
The fig. 5 shows the employee attrition with respect to job role and monthly income. The label yes and no represents the values for attrition. The circles are represented as 'No' value for attrition and small 'x' represents 'Yes' value for attrition. It has been observed from fig. 4, that the employees working at higher job level have less attrition in comparison to those working at lower job levels. The reason is higher salary at higher job level as shown in fig. 4.

Figure 5. Effect on Employee Attrition Rate Based on Two Features: Job Level and Overtime.
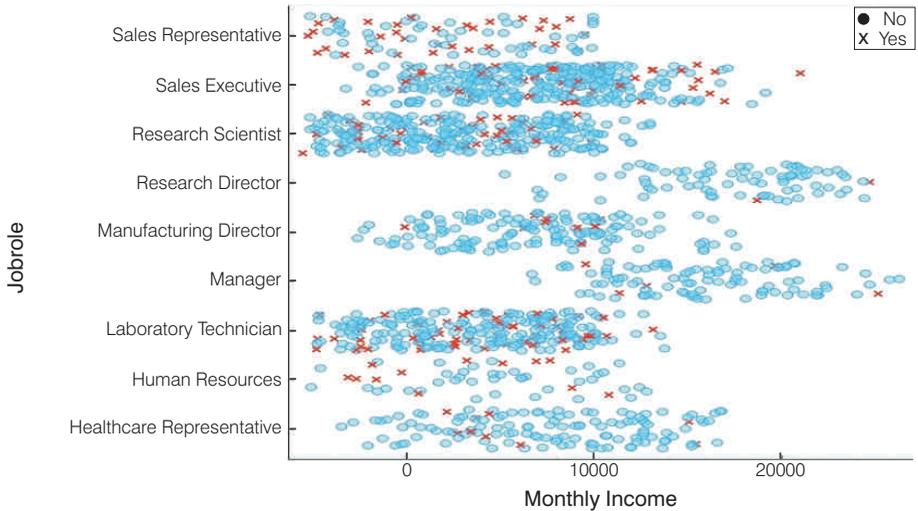
Figure 5.showsthat the attrition rate can vary with respect to job role and varying salary values. There is very less attrition at and above salary 20,000 whereas huge attrition rate can be seen at salary below 10,000. It can be visualized from the fig. 3 that the employees working at middle level have comparatively less attrition rate to lower level employees, i.e. research director, manufacturing director have less attrition rate even at salary less than 10,000. The people working in sales and laboratory techniques have higher attrition rate.

CONCLUSION

This study has extensively showed the factors responsible for high attrition rate. In addition to monetary factors such as salary and perks, other fringe benefits are also taken into consideration. This whole scenario is analyzed using machine learning techniques on a predefined employee's dataset. The dataset analysis using SVM machine learning model has underperformed than linear regression model. The reason behind low accuracy rate is due to high false positive rate in SVM model. Though the number of true positive values is more in SVM model in comparison to linear regression but the increase in false positive rate has deteriorated its performance. These models basically predict whether the employee will leave the organization or not based in the already stated features. Apart from technical reason, the attrition rate is affected by factor sets such as monthly income and job role, overtime and job level etc. Along with employee attrition factors, employee retention factors are also discussed that can help in decrease in employee turnover or attrition.

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CLASSIFICATION OF MEDICAL DATA USING MACHINE LEARNING WITH EVOLUTIONARY OPTIMIZATION TECHNIQUES

ABSTRACT

In the past few years, with the advancement in information technology services, health sector is transformed largely and is transmitting a massive amount of medical information. Computational methods like artificial intelligence, machine learning and deep learning are gaining attention because of their capability to find patterns and reason about data, which empowers healthcare practitioners to take decisions for precise medicine. This paper discusses the potential of using optimization algorithms with different machine learning schemes and deep learning based method outperforms other learning schemes using non-invasive clinical parameters.

KEYWORDS : Deep Learning, Fuzzy unordered Rule Induction, Coronary Artery Disease.

INTRODUCTION

Health sector is one of the fastest growing sectors, in all the developed and developing countries throughout the world. With such a fast growth, this sector is generating a huge amount of complex medical data about patients including inter alia, clinical parameters, hospital resources, medical devices, disease diagnosis and patients' records. There are lots of reasons for the information outburst. The palpable one is increase in technology. As the potential of digital procedures increased and prices plummeted, every business has been using more and more of technology to automate the processes and to get real time data for business decisions. Healthcare also has not been left out from this. A lot of information that was earlier not available or hidden is now on hand because of the high performance of the automated devices like sensors. Data generation and extraction of information is not sufficient as data come from heterogeneous sources with multidimensional characteristics, we need to increase our ability to analyze and formulate better ways of retrieving the facts from it by careful selection of these characteristics. To handle and analyze such an enormous data with multidimensional facet, every industry needs some technology and intelligent computational techniques. Techniques like data mining (DM) and deep learning gained a lot of attention from researchers due to their capability of identifying hidden patterns and complex computational ability especially in medical domain (Liu et al, 2014; Brosch et al 2013; Yoo et al 2014).

According to Registrar General of India and the Centre for Global Health Research, report (2000-2013) cardiovascular diseases are among the top most causes of deaths in India.

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Fig:1 Percentage of top 10 casuse of death in India

Percentage of top 10 casuse of death in India
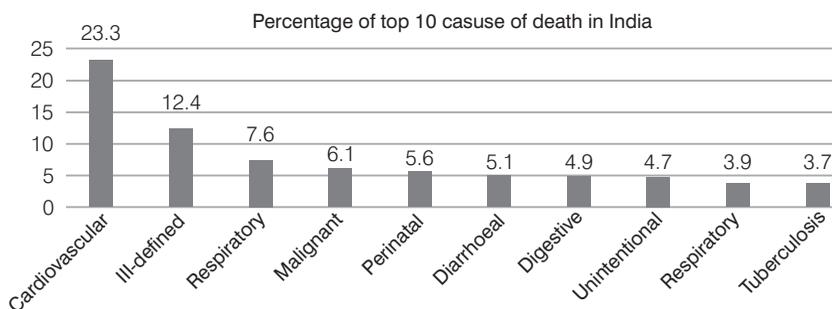
Cardiovascular disease is a class of diseases that involves the disorders of heart and blood vessels. It is caused by atherosclerosis (accretion of plaques) of the coronary arteries. Plaque formation obstructs the flow of blood to heart muscles by narrowing, hardening or clogging the coronary arteries, and can lead to heart attack and even death (Tsipouras et al, 2008; São Paulo et al,2005). According to WHO, in 2030 it is expected that 23.6 million people will die from CVD'S (WHO stats). India lost 9.2 million year of productive life of age group of 34 to 64 because of heart disease in 2000 (K.S Reddy et al, 2005). This is an alarming situation because the presence of CVD has gone high for people in the age group of 25 to 69 that covers almost the biggest chunk of productive people in a country (K.S Reddy et al, 2007).

Prevention is possible in CVD with the early accurate diagnosis and immediate treatment. Proper knowledge of risk and avoidance is useful in early identification and increases the accuracy of diagnosis (Delen et al, 2005). One of the widely accepted invasive methods is coronary angiography (CA), a gold standard amongst clinical tests, which is a high cost, highly technical and painful process.

These limitations inspire exploration of non-invasive methods and less expensive techniques for the detection of CAD. DM has already been recognized as one of the promising technique for exploring hidden patterns in the huge datasets and thus makes it a suitable for CAD detection without going through invasive methods such as angiography (Alizadehsani et al, 2013; Acharya et al, 2013, Escolar et al, 2006, Giri et el, 2013). Some of the major contributions of various researchers are shown in Table 1.

Table 1: Contribution of researchers

Reference	Year	Method	Outcomes
Zeinab Arabasadi et al	2017	Genetic algorithm with neural network	Diagnostic accuracy of 93.85 % and sensitivity of 97% and specificity of 92%
Babic et al	2017	Decision Trees, Naive Bayes, Support Vector Machine and Neural Network	models proposed were comparable with existing studies and in some cases comparable or better.
Verma et al	2016	CFS based feature selection method with PSO search	Proposed method improved the prediction accuracy of diagnostic models
P. Melillo et al	2015	SVM, Random Forest, ANN	Higher predicted values are shown by data mining classifiers as compared to echo graphic parameters. Random Forest outperforms other classifiers
W. Dai et al	2015	Ada Boost logistic regression, a Naive Bayes, SVM, and a variation of a Likehood Ratio	Prediction of heart related hospitalization.
A. Worachartcheewan	2015	Random Forest	Prediction of Metabolic syndrome in Thai population.
Jajroudi, M. et al	2014	Artificial Neural Network and Logistic Regression	Prediction of survival in thyroid cancer. ANN method outperforms the rest on SEER Data set
Chin-Wen Cheng et al.	2013	Association Mining	Relationship between Comorbidity and length of stay, medication usage and ICU outcome for Intensive care units. units.
Syed Umar Amin et al	2013	Neural networks and genetic algorithms	Prediction of heart disease. Genetic algorithm is used to optimize neural network achieve the prediction accuracy of 89%.
Austin PC et al	2011	Boosting and decision tree	Prediction of mortality for myocardial infraction.

RESEARCH METHODOLOGY

The Z-Alizadeh sani data set is obtained from one of the most popular repositories of the University of California at Irvine. It contains records of 303 patients with 54 features. These include patients demographic, historic and laboratory features. Some of the features are age, weight, length, gender, Body mass index, Diabetes mellitus, Hyper tension, smoking status, obesity, cronic renal failure, cerebrovascular accident, airway disease, thyroid disease, Blood pressure, Edema, chest pain , diastolic murmur, systolic murmur, dyspnea, Q wave, ST Elevation, ST Depression, High density lipoprotein, Low Density Liporortie and result of Angiography as a deciding factor for CAD.

MODEL CONSTRUCTION AND LEARNING SCHEMES

The dataset was having 54 attributes and every attribute having some amount of effect on the outcome. Features that are not significant, means they are not contributing much to the prediction outcome must be ignored. A feature selection technique is used to remove the irrelevant redundant and noisy data as well as used to reduce the dimensionality of feature space. The technique enhance the execution speed of mining engine and modeling framework is affected in terms of data quality, performance and understanding of the mining results (Verma et al.,2016) The best feature subset should suggest the least number of features that are highly significant and contribute maximum in terms of accuracy and efficiency.

Preprocessing of the data was carried out using feature subset selection with one of the evolutionary optimization techniques, Cuckoo search method. Then models created with FURIA, C4.5 (Decision Tree) and Deep learning were validated using ten-fold cross validation method.

The performance measures that were recorded, to analyze the proposed models were accuracy, misclassification error rate.

PERFORMANCE MEASURES

Performance measures such as accuracy, error rate, specificity and sensitivity are recorded to measure the performance of a classification model (Karaolis et al,2010).

True Positive (TP) - number of cases which are actually positive and the model predicted as positive. True negative (TN) - number of cases which are actually negative and the classifier predicted as negative.

False positive (FP) - number of cases which are actually negative and classier predicted as positive. False negative (FN) - number of cases which are actually positive and our classifier predicted as negative.

Accuracy- It is the percentage measure of correctly classified objects by classification method.

$$Accuracy = \frac{TP+TN}{TP+FP+TN+FN}$$

Error Rate - It is the percentage measure of wrongly classified object by the classification method.

$$Error\ Rate = \frac{FP+FN}{TP+FP+TN+FN}$$

Results

Table 1: Accuracy/error rate/KS/MAE/RMSE with all the features

Model	Accuracy	Error	KS	MAE	RMSE
Deep learning	82.84	17.16	.592	0.1763	0.391
C4.5	79.20	20.79	.4722	0..2365	.4429
FURIA	80.19	19.80	.4729	.2083	.4199

Table 2: Accuracy/error rate/KS/MAE/RMSE with reduced features

Model	Accuracy	Error	KS	MAE	RMSE
Deep learning	84.81	15.18	0.624	.1787	.3393
C4.5	83.16	16.83	0.593	.2098	.3792
FURIA	83.49	16.50	0.5855	.1672	.3699

Figure 2 : Accuracy and error rate of models using cuckoo search
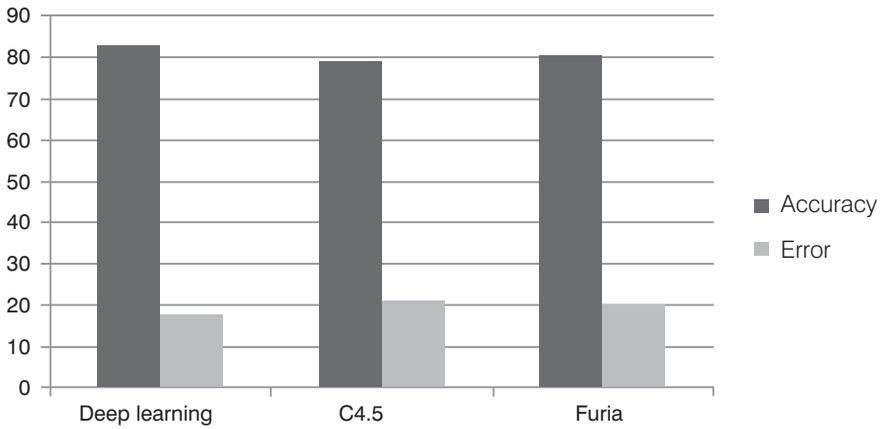

Figure 3 : Accuracy and error rate of models using all the features
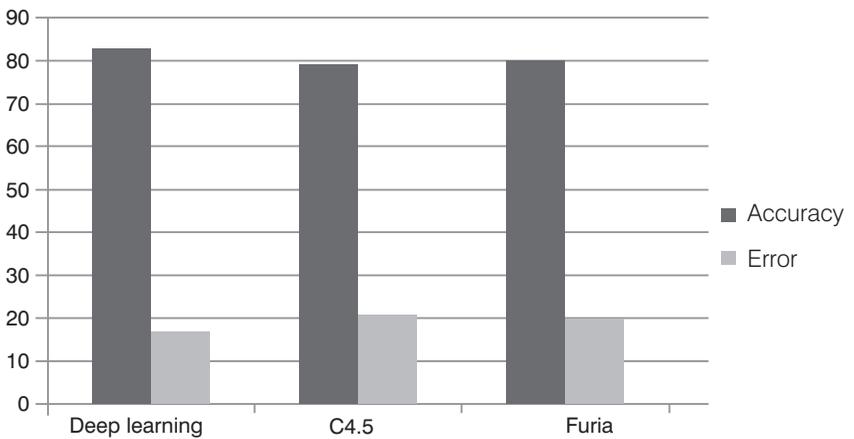
CONCLUSION

This has been proved in the literature that classification performance of models may differ from one problem to another. Their performance rely on algorithms selected for model construction, preprocessing techniques, methods used for feature selection and validation. The study examines the deep learning approach and correlation based feature subset selection method with cuckoo search for predicting the CAD. Dimensionality of the data set is reduced and only seventeen parameters are used to construct the model. By reducing the dimensionality of the feature space, improvement in accuracy is reported in case of all the models. Deep learning based method achieved the highest prediction accuracy of 84.41% and got the lowest error rate of 15.18 % and highest value of Kappa Statistics i.e. 0.624 and mean square error of 0.1787. By reducing the dimensionality of the feature space the accuracy of the deep learning method is increased by 1.97 % . Random forest achieves the prediction accuracy of 81.84% and error rate of 18.15 %. The value of KS for random forest is 0.5351 and root mean square error is 0.314. On the other hand C4.5 gives the prediction accuracy of 83.16 % with error rate of 16.83%. FURIA achieves the prediction accuracy of 83.49% and misclassification error rate of 16.50%. Thus deep learning based model can be used to predict CAD cases more accurately than other schemes. Cuckoo search method is used to find out the most influential risk factors for identification of coronary artier disease using non invasive clinical data. Result of deep learning based method is promising and can be used as an adjunct tool for clinical practices.

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MYSTERY SHOPPING IN BANKING INDUSTRY FOR SUSTAINABLE MANAGEMENT AND GROWTH

ABSTRACT

With a manifold increase in information technology, various banks across the country have migrated to core banking platforms. Debit cards, credit cards and electronic channels such as, ATM's, telephone banking and internet banking have emerged. The threat of fraudsters has also been increased in these arenas. The security plays a vital role and the responsibility of fighting such fraudsters should be laid on the bankers as well. High measures should be taken to improve the security threats and also reporting of such cases should be duly made. There is a dire need of governance in the banking sector to erase the black mark, which is caused due to fraudsters in the areas of information technology. It is needful to recall the definition of fraud in such a situation. This study gives an understanding of various frauds and measures to reduce the frauds in the Indian Banking Sector, henceforth, Ghost Shopping Tool, a unique method is used, the internal control system can be strengthened and would be adequate with the implementation of ghost shopping method. The Cronbach alpha for the study was 0.8, which shows that the data is ideal, and the KMO and Barlett's test was used. The sample size of this study is 80. The study concluded that the security should be strengthened and the market research has to be implemented by using the tool of silent observation and mystery shopping.

KEY WORDS: Banking fraud, prevention, ghost shopping, unique tool

INTRODUCTION

In the recent past, there is a definite gradual increase in reporting the financial frauds in India, putting the regulator, i.e., the Reserve Bank of India into a serious cause of concern. The frauds in banking sector are treated at the cost of business. Also, after 1990's with the implementation of Liberalisation, banking frauds have increased extensively. The Reserve Bank of India has stated that fraud is "A deliberate act of omission or commission by any person, carried out in the course of a banking transaction or in the books of accounts maintained manually or under computer system in banks, resulting into wrongful gain to any person for a temporary period or otherwise, with or without any monetary loss to the bank". In broad sense, mystery shopping is known by several names such as ghost shopping, secret shopping, hush-hush shopping, performance evaluation, service monitoring, quality auditing, service examination, service checks and forefront evaluations. Mystery shopping provides companies with a means of monitoring services from the consumer's perspective. It gives management the ability to frame strong strategies to run the business in a smooth way and to sustain in the market for a longer span of time as market leaders.

Molly MC Donough (2004), in her research article has stated that secret shopping helps to bring about a quick resolution to the problems when business owners know what they are

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missing in their business opportunities. Xu Ming states that mystery shopping is an outstanding market research practice and a cognitive process which can provide exact results and has many advantages over other conventional methods which are traditionally used to measure the quality of services. For over the years, several companies have implemented mystery shopping tool to grade employee services and the factors such as quality of the product, price of the product, sale performances, customer loyalty, customer satisfaction and customer know how. Enigmatic shoppers are freelancers who pretend like a normal customer and enter into various stores and service providing institutions to evaluate the amenities. Information that has been gathered on various factors such as, service provided, quality attained, cleanliness as well as other issues on behalf of the company owners, and also prepares a detailed report which is submitted to the firm through the market research agent. These mystery patrons are paid for the quality of report furnished by them within the given time span and they have to obligate good acting skills. ESOMAR world research codes and guidelines bring out the concept of acting naturally.

MYSTERY SHOPPING

Anand Shankar Raja M (2016) (1) says that mystery shopping is a simple concept which deals with just silent observation but the stress and pain which mystery shoppers face during each assignment is enormous. This job needs a lot of motivation and a balanced mind to cope up with the barriers and to be a successful mystery shopper. Thus, the importance of motivation, emotional intelligence and job satisfaction of mystery shoppers are to be determined to provide necessary steps which may help them to leave successful foot prints and shine in their profession. Anand Shankar Raja M (2016) studied the emotional Intelligence of mystery shoppers under the heading "EI" an essential cause for mystery shoppers and says that health is an important component to be successful in life. For a profession like mystery shopping, Emotional Intelligence is an important component, which has to be considered. Mystery shoppers handle rough customers throughout their assignments and thus, they have to have the ability to understand and experience others mentality and act according to the situation.

MYSTERY SHOPPING IN THE BANKING CONTEXT

A growing tribe in the country popularly known as mystery shopping companies are helping banks undertake audits, which are covert in nature on various employees and branches ensuring that they strictly adhere to the rules and regulations required to avoid money laundering, and to improve customer services. Recent research says that about 20% of the total mystery audits are conducted by banks. These banks shell out anywhere between Rs 2,500 and Rs 7,000 per audit to mystery shopping companies. Big banks such as ICICI Bank, Axis Bank and HDFC Bank hire mystery shoppers to undertake thousands of audits every year. Axis Bank conducted over 4,000 audits to improve customer experience and ambience of branches and ensures on the regulatory requirement of the bank. Banks in the Public Sector

like State Bank of India (SBI) also undertook and are still using this unique tool to perform audits in-house to track customer satisfaction, complaints received and the redressal zone to improve the quality of services. The rest of the audits are directed at improving branch ambience, feel of ATM, behaviour of staff, and overall services. ICICI Bank has initially used mystery shopping in Pune to have a look at the services provided by one of its many branches, and were able to conduct the survey by telephone using mystery shoppers to find out the various services being provided to various age groups by the bank says **Karia, P.M (2005),**.

The IRDA (Insurance Advertisement & Disclosure), with regard to remedial action and complaint cases, is backed up by mystery shopping. IDBI Bank now plans to rope in a market research agency for mystery shopping. IDBI bank gets customer feedback through the grievance-handling unit to understand expectations, problems and even suggestion for new services or products. **Reserve Bank of India (2011)**, says that mystery shopping is a critical part for assessment of vulnerability. Transactions are put into realistic scenarios to test the effectiveness of controlling factors. Apart from the banking and insurance sector the efforts of using ghost shopping have been taken by some retail houses like Titan, Arrow and Reliance communications. Business India published an article on the theme Retail Therapy from which it is evident that mystery shoppers have grown in leaps and bounds in the Indian retail industry.

OBJECTIVES OF THE RESEARCH

1. To understand the different factors to be considered for transparent and better banking services in the eyes of mystery shopping.
2. To spread awareness of market research tool to control fraud practices.

NEED FOR THE STUDY

Fraud has cascading effects on financial and psychological areas. Although the monetary loss cause by a fraud can be significant, the potential effect of fraud on banks is astounding. Loss caused to the goodwill, reputation and relations with customers can be disastrous. As frauds can be committed by employees within the bank and by outsiders, a sound system for managing fraud is required to be in place to safeguard the bank's reputation and assets. The market for detection of frauds and prevention of frauds with regard to public sector is forecasted to grow at a substantial rate. As public sector transactions involve large amount of money and information, the risk of data and money theft is large, which ensures a high growth rate for the detection and prevention of frauds in this segment. Banks are now pushed to a situation to take up market research to prevent frauds. Thus, the best tool selection to create a solution for this problem is a great task to be determined.

REVIEW OF LITERATURE

The Government has now become aware of these aspects and has taken initiatives to improve the **SERVQUAL** through mystery shopping. The purpose of mystery shopping is to understand the front line of the staff's personal performance. This tool is a diagnosing technique to confirm lose efficacy and fall point of organization in service process says **Dawson & Hillier (1995)**. **Grove & Fisk (1992)**, said that spook shopping is also a reward measure tool which can encourage employees and provide the organization with the service to value the competition to others. **Toptests R.O. (2008)**, in his research work stated that the data congregated is analysed taking into consideration reliability, convergent validity, standard validity and the stability of various service checks. They produce an accurate report which exhibits a high degree of reliability which in turn will help the top management to mount better decisions. For the purpose of effective strategy formulation mystery shoppers collect

data which should be independent, critical, objective and anonymous. Mystery shopping tool is even used to collect competitor's information.

James & Barry (2010), mentions clearly that mystery shopping is one such best tool to understand competitor's actions in every move. The RBI (2014) had key findings, which addressed the stress of marginal capitalization, and asset quality faced by banks in the public sector, and provided recommendations to avoid such problems. Rajan (2014) stated that if there was good governance and if autonomy were granted to banks in the public sector, it would help them deal with competition and raise more money from markets when required. Subbarao (2009) believed that without a belief in honest behaviour and broad-based trust, a financial sector of the current size and scale would not be in existence. He stated that moral hazard problems with respect to the banking sector were due to socialization of costs and privatization of profits. Ogundeji (2005) as cited by Nwanze (2006) explained the types of frauds which included exchange of foreign currency, reconciliation, executive, operations in domestic market, risk assets, frauds in treasury as well as money market, financial control, fund transfer, customer related frauds and teller operations.

Olojo (2006) said that fraud typology to mention a few, consisted of corporate fraud, frauds internal and external in nature, frauds by executives, syndicated fraud, frauds related to electric failures, computer fraud, slow judicial related fraud, survival politics induced fraud and rotten leadership fraud. Owho (2005) described that frauds could be of the following type: defalcation, suppression, theft and embezzlement, forgeries, payment against uncleared effects, fraudulent substitution, lending which is not authorized, kite flying and cross Firing, lending to ghost borrowers, unofficial borrowing, over invoicing, foreign exchange malpractices, manipulation of voucher, impersonation, fictitious accounts, false declaration of cash shortages, valuation of properties over or under its actual value, fictitious contracts, falsification of status report, duplication of cheque books, fraudulent use of bank documents, misuse of suspense account, mail transfers, drafts, interception and switching of telex messages, interception of clearing messages, inflation of statistical data, computer frauds, robberies, laundering, false proceeds of collection, teeming and lading, claim of supernatural influence, double pledging and fake payment.

RESEARCH METHODOLOGY

The paper looks at the various types of problems involved in the banking scenario due to fraud practices. The research makes use of mystery shopping concept to highlight its contributions towards a sustainable and better banking practices. To know whether the data is ideal and reliable a test known as Cronbach Alpha was induced. The sampling was done using convenient sampling. The data has been collected from those mystery shoppers who have done the banking assignments. The sample size for this study is 80 and the area coverage is based on the nature of assignments being allotted for the mystery shoppers. No special importance was given to the classification of banks but in general, those banks, which were under the mystery shopping observation, have been taken for the study. The data was tabulated and then coded for analysis. The data was then scrutinized by using statistical package for social sciences. (SPSS 21.0)

LIMITATIONS OF THE STUDY

The tools applied in this research analysis have certain technical bias, which in turn has affected the findings. This study aims to find only on the fraud banking practices whereas the other dimensions like SERVQUAL, customer centric and loyalty has not been taken into account. The future researchers to better explore into the new dimensions can use this gap.

Reliability Statistics	
Cronbach's Alpha	N of Items
.800	16

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.722
Bartlett's Test of Sphericity	Approx. Chi-Square	297.865
	Df	45
	Sig.	.000

RELIABILITY TEST

As this research has used a Likert type scale it necessary to test the reliability and internal consistency of the questionnaire for which a Cronbach's alpha test is employed. For the purpose of reliability, there were 16 scales constructed and put to test. From the above table a clear picture of data reliability was seen. It is important to give importance to sample size and adequacy and hence KMO test has been employed and the results are favorable.

Table Showing Communalities For Scale Items Used In Factor Analysis

Scale constructs	Initial	Extraction
Fraud vulnerability assessments	1.000	.835
Review of new products and processes	1.000	.774
Fraud loss limits	1.000	.840
Root cause analysis	1.000	.954
Data/information/system security	1.000	.835
Know Your Customer (KYC)	1.000	.774
Know your employee	1.000	.840
Know your partners	1.000	.954
Website of the certification agency.	1.000	.616
regular security audits	1.000	.958
Data not copied on magnetic/optical media	1.000	.953
Creation of fraud awareness amongst staff and customers	1.000	.717
Exceptional/suspicious transactions/activities reported	1.000	.489
Opening up safer transaction channels	1.000	.958
Mystery shopping exercise as per RBI	1.000	.953
Safer technological transaction	1.000	.845

Total Variance Explained: From the factor we have derived 8 iterations and the total cumulative value is 78.345 and finally we proceed with the rotated component matrix. The rotated component analysis helps to show the factor loadings for each of the scale

constructs. The following names have been given based on the highest factor loadings. The factor matrix consists of coefficients, which help to express the standardized variables in terms of the factors.

Table showing Rotated Component Matrix

Scale	1	2	3	4	5	6	7	8
Data not copied on magnetic/ optical media	.876							
Data/information/system security	.857							
Fraud vulnerability assessments		.719						
Root cause analysis		.660						
Creation of fraud awareness amongst staff and customers			.833					
Exceptional/suspicious transactions/ activies reported			.834					
Fraud loss limits				.585				
Opening up safer transaction channels					.579			
Review of new products and processes					.515			
Regular security audits						.456		
Mystery shopping exercise as per RBI						.567		
Website of the certification agency							.675	
Safer technological transaction							.678	
Know Your Customer (KYC)								.654
Know your employee								.764
Know your partners								.345

Varimax procedure is the method for rotation used. This method of rotation is an orthogonal method that minimizes the variables with high loadings on a factor, which helps to make the interpretation of the factors easier. Based on the table, eight components were created for the 16 variables. These factors were respectively labelled as per the item loadings as follows:

1. The factor "Legal transaction process" explains the 1st component.

2. The factor "Fraud in-depth assessment" explains the 2nd component.

3. The factor "Fraud awareness education" explains the 3rd component

4. The factor "Transaction reporting" explains the 4th component

5. The factor "proper product/service information" explains the 5thcomponent

6. The factor "Security alerts" explains the 6th component

7. The factor "Safe use of technology" explains the 7th component

8. The factor "KYC" explains the 8th component

CONCLUSION

Banks should undertake fraud vulnerability assessments with the help of a management of risk group. The compliance of the fraud risk management group and the audit group must be taken for the approval of any new product or process introduced by the bank. 'Fraud-loss' limits must be used to cover all the types of risks in new products. Any fraud cause, which is unique and involves and amount of over Rs. 10 lakhs, should be reviewed as soon as the fraud is detected. It is important that any gap in operations is covered and the products are redesigned after the findings are obtained. Banks have come up with various measures to protect themselves and have many security measures to deal for their important documents, customer deliverables and information. Banks should have team, which works towards protecting their physical infrastructure. This team must ensure that lapses are avoided at offices by performing security audits regularly. Fraud management is important to increase the awareness regarding the prevention and detection of frauds.

Banks must also increase the awareness among their customers and staff with respect to frauds. Fraudsters are able to conduct frauds despite strong controls to avoid frauds. Thus, it is important to detect frauds early so that the fraudsters can be dealt with and the losses can be recovered. Some of the techniques, which are used for detecting frauds, include mystery shopping exercises, encouragement to report suspicious transactions, system triggers that find unique transactions and opening a communication channel that looks at customer and employee alerts. The transactions, which are reported with the help of such mechanisms, must be looked at in detail. Internet banking and similar activities face major barriers in the form of security issues, which are persistent with regards to the payment systems. Minimal research has been conducted with respect to the experience of an organization over fraud prevention and the factors, which were significant for such prevention of frauds. The factors, which have been identified, require an in-depth study to understand how critical they are for fraud prevention.

Effective ways other than technology needs to be administered to control security risks by using simple research tools and one such tool is marketing research associated with silent shopping method. A manager's control over activities and continuous supervision is important to detect any kind of abnormal activity. As banks are large in size and have such a wide scope this must be complemented with mystery shopping to detect any flaws in the security and to identify dishonest employees or vendors so that the required actions can be taken against them to try and make the banking scenario a safer place. Banks have made use of various methods to control fraud by implementing various strategies and plans but unfortunately nothing has worked on a positive way. Banks must now take this opportunity to implement this market research tool to prevent fraud. Thus, mystery shopping and silent observation being unique tools to reduce banking fraud is not a doubt.

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MEDIA MARKETING: A CASE STUDY OF DELL TECHNOLOGY

ABSTRACT

Social media marketing refers to the tools that target social networks and applications to spread brand awareness or promote particular products. The main objective of the present paper was to study the impact of social media marketing on the marketing strategies of the company. Social media and Marketing strategies have been discussed through a   case study of Dell Technology. The analysis has been done in a contextual setting and focuses on the evaluation of strategies and theories. The qualitative approach has been justified by giving numerical figures. The present paper is based on secondary data resources i.e. information that has already been collected and is available.   We concluded that Dell follows a holistic approach in regard to its website, where as HP and Acer focus on targeted advertising of its products.

INTRODUCTION

The rising internet penetration and growing proliferation of tablets and smart phones, the business environment is changing rapidly. In this dynamic business environment, fast paced world of digital media is a big challenge for all types of business organizations. Understanding of digital landscape holds critical importance in running business of any type. Knowledge of the tactical issues surrounding digital marketing and its strategic impact, particularly the use of social media and mobile technologies have become increasingly important.

In this paper, the meanings of digital marketing along with the tools adopted for its implementation have been discussed. An analysis has been conducted of digital marketing strategies adopted in two different industries- Technological and Fashion Apparel, by evaluating the digital marketing journeys of Dell Technologies and H&M (Hennes and Mauritz) and comparing their digital activities with their competitors to highlight their strengths and weaknesses. Further, by evaluating web and social media analytics, results have been drawn and recommendations have been made on how the companies can strengthen and improve their digital marketing framework

DIGITAL MARKETING - AN OVERVIEW

Digital Marketing is an umbrella term used for marketing of goods and services using digital tools such as social media, email, and websites to connect with the current and potential customers. Digital Marketing can be used by companies to bridge the gap between their business objectives and the target audience by communicating their value proposition.

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DIGITAL MARKETING TOOL KIT

A wide range of digital tools and channels are available to impact different stages of the user journey and to deliver the brand's value proposition.

SEARCH MARKETING

Search Marketing encompasses both Search Engine Optimization (SEO) and paid search activities. SEO refers to the process of attaining search rankings within the natural/unpaid results. In general, higher the frequency and ranking of a website on the search engine, more visitors it will receive and these visitors can be converted into customers. The key step in SEO is an understanding what the target audience is searching for and why and knowing how the search fits in.

Paid Searches include Pay Per Click (PPC), Paid search ads, Cost-per-thousand impressions etc (CPM). Most ads are sold on PPC basis. PPC is a digital advertising tool used to direct traffic to websites in which an advertiser pays a publisher (generally a website owner or a network of websites) when the advertisement is clicked. PPC is an auction-based system in which advertisers are allowed to bid for ad placement in a search engine's sponsored links. Every time the ad gets clicked, sending a user to the website, small fee has to be paid to the search engine. The key advantage of PPC is the ability to control and target it precisely.

SOCIAL MEDIA MARKETING

Media has been one of the most impactful digital channels as it has changed the ways in which brands interact and engage with customers. The ability of a brand to provide interesting and useful content to share and its willingness to engage in an open and authentic manner influences the effectiveness of a social media strategy. Face book, Instagram, Twitter and YouTube are some of the most popular social media channels which are used by companies to reach much wider audiences than through the use of traditional advertisements at a fraction of the cost. Social Media Marketing is used by companies to build personal relationships with the customer community and it also helps in building links that in turn support SEO efforts.

E-MAIL MARKETING

E-mail marketing is one of the most personal and adaptable forms of digital marketing. It involves sending a commercial message using e-mail to current or potential customers. In recent years, e-mail marketing has been on the decline due to emergence of social media platforms and problems associated with e-mail spam. In order to secure higher response

rates from users, the use of e-mail shouldn't be limited to a broadcast channel, rather various techniques should be employed to make e-mail as tailored, relevant and useful to users as possible. The success of e-mail marketing lies on making the right offers to users, at the right time and at the right level of frequency.

ONLINE ADVERTISING

Online advertising refers to delivering promotional marketing messages to users via the Internet. It is fundamentally about various forms of banner advertising such as video ads, paid search etc. Online advertising provides the flexibility to create highly interactive, creative and varied advertisements. Most online advertising is sold on cost per mile (CPM) basis which means that a certain fee has to be paid every time the advertisement is shown 1000 times. Hence, the payment is for display and not for results. However, customers often view online advertising as an unwanted distraction and have turned on the ad blocking service.

MOBILE MARKETING

Mobile marketing refers to marketing through a mobile device. Mobile Marketing provides the benefit of supplying time, local sensitive and personalized information to customers for promotion of goods, services and ideas. SMS, MMS, App-based marketing and push notifications are elements of Mobile Marketing. With the widespread use of smart phones, App usage has also rapidly increased. Marketers are thus focusing on using applications for promotion of products and services. Applications allow for direct engagement of customers, payment and targeted advertising.

MEASURING THE EFFECTIVENESS OF DIGITAL MARKETING CAMPAIGNS

Measuring the effectiveness of digital campaigns is a significant part of efficient marketing. However, it is a complex process because of difficulties arising from fragmented data, multiple tools, differences in reporting and interpretation of data etc. Although the ultimate measure of evaluation of any business initiative is the return on investment, a practical combination of techniques that map out all of the steps of the user journey and see how the contribute to end objectives are needed.

The metrics can be classified on the basis of type and time span. On the basis of type, metrics can be classified into "Quantitative" or "Qualitative". Volume is prevalent in digital marketing measurement, especially Social Media. Things such as number of emails sent, number of page impressions or unique visitors to the sites can be measured. However, they aren't true measures of success rather they are indicating factors that can lead to desired outcomes. Qualitative metrics include enhanced "Brand awareness and image" and "relationship with customers". Due to its subjective nature, these metrics are more difficult to assess. Feedbacks and surveys are the commonly used qualitative metrics. On the basis of time span, a marketer can use "Interim Metrics" which provide insights during the user journey or "Final Metrics" which indicate whether overall initiative was successful or not. Thus, a marketer has to use a combination of different measurement techniques to understand the impact of each element of marketing activity. This includes basic web analytics, search volume and social media analytics.

METHODOLOGY

The research approach that has been adopted in this paper is a balance of qualitative and quantitative methods. The analysis has been done in a contextual setting and focuses on the evaluation of strategies and theories. The qualitative approach has been justified by giving numerical figures. Due to the difficulties in obtaining information from primary sources, the present paper is based on secondary data resources i.e. information that has already been collected and is available. The data is mainly extracted from official company websites, newspaper articles and blogs, statistics have been drawn from www.alexa.com and Digital Branding book by Daniel Rowles has also been referred.

ANALYSIS OF DIGITAL MARKETING STRATEGY ADOPTED BY DELL TECHNOLOGIES

ABOUT THE COMPANY

Headquartered in the United States, Dell Technologies is a computer information technology company offering Desktop PCs, mobility devices, financial services, software and storage etc. Named after its founder, Michael Dell, Dell Technologies is the largest private technology company in the world. It employs around 1,40,000 people globally and has a revenue of $74 billion.

MARKETING OBJECTIVE

The marketing activities of Dell Technologies focus on attaining qualitative and quantitative leadership in the technology industry by expanding the market share through market development and increasing the product awareness and sales through the use of persuasive promotional tools.

DIGITAL MARKETING STRATEGY

DELL has recognized that digital marketing is an important ingredient of marketing in modern times. However, this realization did not come easy. In 2005, Dell had witnessed a massive backlash when a blogger had posted about his unsatisfactory customer service experience on the purchase of a Dell laptop in a blog titled "Dell Lies. Dell Sucks". The post went viral creating a firestorm on social media which is often referred to as "Dell Hell". The experience of one customer created a domino effect resulting in negative feedbacks and criticisms from several other customers which in turn adversely affected Dell's reputation and sales. The incident served as an eye opener for Michael Dell who recognized the power of digital media tools in building direct relations with the customer community. As a result, Dell first established its digital presence by launching a blog in 2006 on technical support.

Thereafter, it expanded its digital activities to attract the potential customers by promoting its content and amplifying social media.

The key focus of Dell has been on 3 areas:

1. Optimizing the search engine so that in the consideration phase of the buying cycle, the potential consumers are aware of what the company has to offer to fulfill their needs.

2. Utilizing digital identifiers such as cookies and cross device tracking to fuel targeted digital marketing.

3. Identifying the customer's needs by evaluating their interactions with the content available and providing information to stimulate buying.

CONTENT MARKETING

DELL BLOGS

The emergence of social media and blogosphere presents a complex challenge for a company as it can tarnish the company's image within a few minutes but on the other hand, it also provides an opportunity to enhance customer relations by engaging in direct personal conversations. As an attempt to combat the negative repercussions created due to the "Dell Hell" blog, Dell launched its own blog called One2One to give the company a human touch. It tapped its employee of 14 years, Lionel Menchaca who effectively created the blog in which he admitted to the company's problems and provided the required technical support. As a result, the company managed to turn a negative incident into a positive outcome by reconnecting with the customer community and earning back its trust. Recognizing the significance of the new socially- networked world, Menchaca and his team did not limit themselves to a blogger outreach. They initiated a "listening and responding" program for community building, customer reach and support, and online discussions with subject matter experts. With four to five thousand interactions about Dell being started everyday, the program was a success. In July 2006, Dell launched a blog titled Direct2dell. Direct2dell is the company's corporate voice to cover the entire spectrum of Dell's business. Due to the increasing complexity and size of the organization in today's time, Dell doesn't operate through a single blog but has multiple blogs in place focusing on different dimensions of business- products, technology software, customer support etc. The links of all the blogs are assembled on a single landing page from where different websites can be accessed.

In order to harness the various ideas shared by people, Dell has launched another blog called Idea Storm. Idea Storm is a website which invites people to share their ideas about products which Dell can offer as a technological company and suggest ways to improve existing products and services. Idea Storm positioned Dell as a forward-thinker that recognized that the people they served might have some good thoughts on how to serve them. Idea Storm provides digital space for sharing of ideas and serves as an effective feedback mechanism.

To enhance customer's overall experience and effectively market its products, Dell tapped the medium of videos and podcasts and launched Studio Dell targeting the full spectrum of Dell customers with tailored content on three channels- Home, Small Business and IT Pro. In addition, customers have the option of uploading their own videos in "Your Stories" section to share their experiences with Dell products.

SEARCH ENGINE OPTIMIZATION

Since online marketing of products and services was a key focus of Dell's business strategy, it planned to use SEO to streamline all the international websites. However, the company's search position system was unsatisfactory with results of one country's products being displayed on the search of another country on the first page of results. Thus, Dell formulated a SEO based marketing strategy in which it implemented aggressive campaigns, reorganized search listings, established online presence and increased visibility. The strategy was a success resulting in an impressive Return on Investment.

41.96%	
Of traffic is from Search	

99.12%		0.88%
Organic		**Paid**

Organic Keywords: ⓘ		Paid Keywords: ⓘ	
dell	16.56%	dell	0.35%
	∨ 0.19%		∧ 2.39%
dell support	4.13 %	dell xps 13	0.26%
	∧ 2.13 %		∧ 289.6 %
alienware	3.92 %	dell xps	0.05 %
	∧ 35.74 %		∧ 500.2 %
dell xps 13	3.55 %	xps 13	0.03 %
	∨ 6.59 %		∧ 435.6 %
dell drivers	3.27 %	dell xps 15	0.02 %
	∨ 3.06 %		∨ 33.84 %
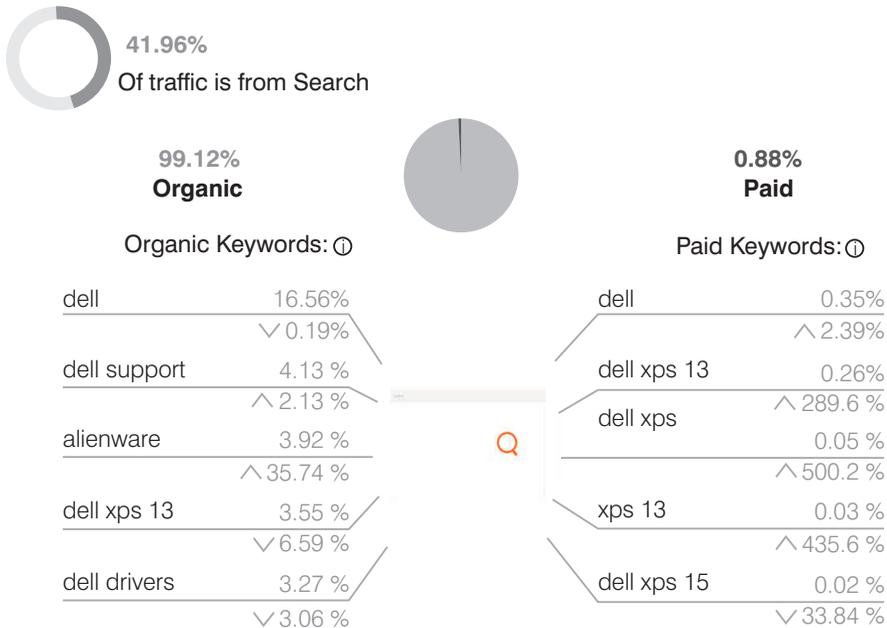
Source: (1www.similarweb.com,2017

The above figure depicts that 41.96% traffic brought to Dell's website is through searches. Organic Keywords i.e. leading keywords which brought free desktop traffic to dell.com constitue 99.12% of total search traffic whereas Paid Keywords i.e. Leading Keywords bought by dell.com to attract desktop traffic from search engines constitue 0.88% of total search traffic.

E-MAIL MARKETING

In order to create awareness of its products, Dell has adopted a strategy of sending GIF centric e-mails. Dell uses GIF technology to create a mini product demonstration in its e-mail which provides the scope of exhibiting a new feature in an easy to understand and visually appealing way. About 2.5% of Dell's website traffic comes from e-mails.

SOCIAL MEDIA MARKETING

As one of the first companies to launch online forums and online support, Dell has a track record of being at the forefront of the social media movement. Dell has been able to successfully utilize the social media tools for generating brand awareness and providing customer support.

DELL ON TWITTER

In 2007, Dell joined the micro-blogging site Twitter. As an early adopter of Twitter, Dell received a lot of attention; however, the attention was dominantly negative as the page was unorganized and lacked purpose. So, the company began testing various uses for the social media platform and found that offering deals to followers gained immense popularity. Today, Dell enjoys a following of 615854 users and uses Twitter to serve four purposes- inform, sell, engage and support. It makes millions of sales each year attributed

to Twitter. Dell believes that engaging customers through personalization is an important factor that has led to the success of the Twitter Accounts.

Realizing that a large number of its Twitter followers were accessing its website to resolve their customer support concerns, Dell launched @DellCares, a program which utilizes social media platforms and internet portals to answer customer queries and concerns directly using tweets and other response methods. The main focus of DellCares has been on customer retentions and proactive customer engagements. DellCares has been highly successful with almost 98% cases being solved without requiring an agent. In addition, it also generates about $265,000 as weekly revenue.

Dell on Twitter Today = more formalized strategy and structure
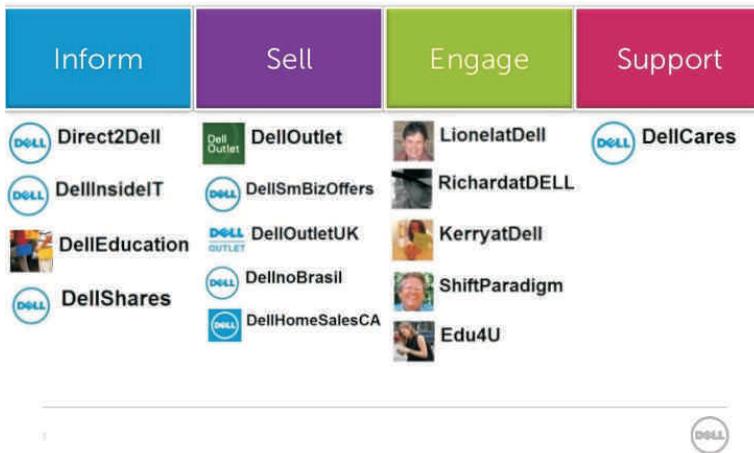
DELL ON FACEBOOK

Much like Twitter, Dell's initial presence on Facebook was unsatisfactory as it didn't know how to use the social media network to serve the customer community. Adapting to consumers' interests, Dell then launched support widgets and apps on its Facebook page designed to allow customers to reach out to Dell Support from within Facebook and access Dell Community Forum threads. Dell also uses Facebook to create buzz for its new products by launching campaigns. Dell India had launched a campaign called "Star of Fun" in a bid to promote Inspiron 14z Ultrabook. The popularity of users had been determined by a fun score calculated on the   basis of likes, comments and shares on the top ten updates and the highest scorer won the Ultrabook at the end of the month long campaign.

SHARE THE JOY' DIGITAL CAMPAIGN LAUNCHED BY DELL INDIA

With the goal of making a mark in the highly cluttered festival market in India, Dell launched a marketing campaign which was well anchored to its business objectives and executed with creativity and in the spirit of the festivities. The campaign focused on being a part of the social conversations and encouraged users to share their stories of festivities using #ShareTheJoy. The campaign gained immense popularity on Facebook, Twitter and YouTube garnering mare than 10 lakh views in the first week itself. On the occasion of

Onam, the users could create and send E-pookalams (colorful arrangement of flowers) to their friends and family on Facebook and earn points which could be redeemed for a discount on Dell products. For Diwali, all the social media platforms were used and the audience was encouraged to share their festive moments. Special offers on Dell products were promoted and various contests were conducted. Share the Joy campaign reached more than 29 million users on Facebook, 14 million on Twitter and 2.7 Million on Instagram making Dell the best choice for the customer audience in the festive season. To keep up with the accelerated use of social media tools and networks, Dell has set up Social Media Listening Command Centers in which it tracks relevant information and then shares it with concerned Dell teams to improve its services. The Center monitors more than 22,000 posts across 11 different languages. Dell has also been actively involved in training its employees by offering them a program to enhance their social media skills at the Social Media and Community University.

COMPARATIVE ANALYSIS OF DELL, HP AND ACER

Technology companies rely heavily on digital marketing channels for generation of demand for their products and services. Since technology companies sell sophisticated products and services, the key focus of their marketing is to educate the customers and aid them in making purchase decisions. Since the early2000s, technology companies have adopted honed and attained higher digital marketing maturity in comparison with other industries.

SOCIAL MEDIA MARKETING

Being one of the early adopters of social media marketing, Dell enjoys a desktop traffic of 2.29% from social media platforms whereas Acer's and HP's desktop traffic from social media networks is 1.59% and1.43% respectively. On the basis of response time, Dell's the most active as it replies within an hour, followed by HP which takes after hours to reply and lastly Acer's response time is aday.
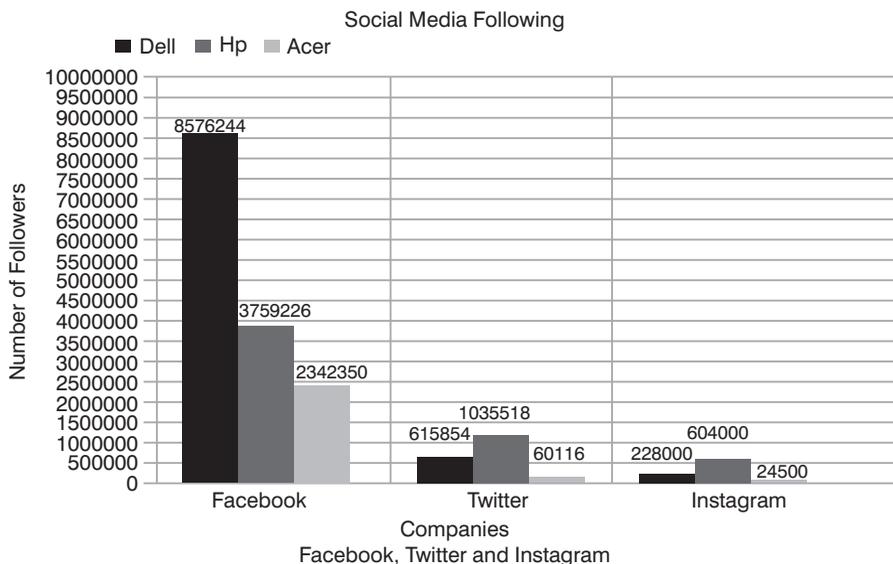
Source: www.facebook.com,www.twitter.com,www.instagram.com,2017

Therefore, it can be concluded that currently Dell is leading on social media platforms vis a vis its competitors. Dell enjoys a strong social media presence owing to its quick and personalized interactions with the audience. Recognizing the power of social media as a strong marketing aid, Hp has been renovating its social media activities and has mobilized customer engagement by implementing an unconventional marketing strategy across several platforms. As a result of Hp's new marketing efforts, the engagement rates of the company have been accelerating. Acer has been unsuccessful in leveraging social media due to inefficient adoption of multi channel marketing strategies and lack of personalization in marketing. Therefore, Acer lags far behind its competitors on social media platforms.

Website Engagement

ANALYSIS OF ENGAGEMENT RATES OF WEBSITE VISITORS

Name of Company	Dell	Hp	Acer
Bounce Rate	40.70%	39.20%	34.90%
Daily Time on site	4:48	4:26	3:41
Website Rank	439	342	3578
Total sites linking in	36,987	53543	7961

Source: www.alexa.com,2017

The Dell website provides a comprehensive network covering the entire IT landscape with various sections devoted to community blogs, technology headlines and customer forums. Thus, it has a high "Time on Site" rate indicative of the high interest and engagement of the visitors. However, the bounce rate i.e. the number of people who visit the site and leave without performing any meaningful action is also high which could be due to the lack of structure and form in the website resulting from the pursuit of showing every conceivable option on the website. The users visit the website more for reading technology and media news rather than for buying products. On the other hand, Hp's website is structured and interactive with the key focus on promotion of products. Thus, Hp's website has attained a better global ranking and a lower bounce rate than Dell's. Acer's website is also highly targeted for advertising of its products. The users visit the website for purchase of consumer electronics, software and hardware.

Thus, Dell follows a holistic approach in regard to its website, whereas Hp and Acer focus on targeted advertising of its products.

CONCLUSION

Overall, from our analysis it can be concluded that Dell has been successful in initiating a digital revolution, which was started as a result of a negative instance that generated a lot of bad press. Dell's executives recognized the opportunities the digital age presents and did not ignore it, rather they invested in it. "Observe-Listen-Engage-Adapt" is Dell's mantra and they have effectively used it to venture into new social media channels. Dell's major competitive advantage lies in serviceability i.e. prompt response and better customer service.

Recognizing that traditional marketing is evolving, Dell provides social media training to its employees so that they are better equipped to connect with customers. The advantages of

a good digital marketing strategy are much greater than one comprehends. Digital marketing changes the way the employees in a company listen, learn, work and evolves the brand in lieu of the changing needs of the customer.

RECOMMENDATIONS

However, in order to make its digital marketing strategy more effective Dell should focus on improving its mobile marketing and website engagement. Dell's advertisements on mobile internet sites have a below average click through and site visit numbers compared to web advertising and social media. Dell should focus on optimizing mobile content that users will enjoy viewing in smart phones or tablets. Since customers these days prefer to message than to talk, Dell marketers should provide the customers the option of live chat and/or the facility to send and receive a text. Dell should also restructure its website to make it more user-friendly, engaging and interactive. The rate at which www.dell.comloads is much slower than other websites, 63% websites are faster than Dell. Dell should focus on optimizing its website in order to attract and retain customers. Dell marketers can also enhance customer experience by improving their application performance which is currently rated 1.5/5 in App Store .Change is at the core of digital marketing. In order to thrive, Dell has to continuously reinvent itself- adapting over time to handle new challenges and to capitalize opportunities.

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SOCIAL MEDIA AS A RECRUITMENT STRATEGY FOR TALENT ACQUISITION

ABSTRACT

A competent workforce is the need of the hour to sustain in the global market for any industry and any organization. To identify the talented and competent workforce the most effective strategy is sound and well structured recruitment process of the organization. Recruitment is the way by which an organization can attract talent pool to its workforce and thus acquire competitive edge over its competitors. Online recruitment is the recent trend of identification and attraction of qualified competent candidates to the organization. It is the process of finding quality candidates and making them aware with the career opportunities existing in your organization by making connection with them. Social media is a place where maximum young generation talent express ideas and interact with each other.

 A number of global and international organizations are using both corporate websites and their corporate social media pages for the purpose of recruitment. This study examined the extent to which these quality potential applicants perceive social media as a useful source of employment information, and utilize corporate websites and social media when collecting information for making their employment and career decisions. The present research work is   descriptive in nature. The population for present study consisted of graduates and post graduate students between the ages of 18 and 24 preparing themselves to be a part of national workforce. The findings provide the   preference level of potential applicants in using both corporate websites and corporate social media pages when searching for employment and job options available for them. It is suggested that a balanced approach in designing of recruitment policy can be adopted to attract quality talent pool to the organization.

KEYWORDS: Talent acquisition, recruitment, social media, competent workforce.

INTRODUCTION

Since the start of 21st century, the technology has taken over different aspects of human lives. With the advancements of technology and internet revolution across the globe, the traditional methods for different objectives are no more in use and found ineffective and replaced by technology driven approaches. Social media is used by different age and gender demographics for sharing of information is nowadays utilized by HR professionals too. Furthermore, the interactions among users of social media professionals at different levels have also witnessed the worth of it with a different approach.

Social media sites such as Facebook, Twitter and LinkedIn have become increasingly prevalent over the past five years which allow individuals and organizations to build a public profile and create a list of users with whom relations can be developed. The popularity of

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social media sites has been a move toward using these platforms in many business sectors to manage and promote business in area such as employee or recruitment management. Social media sites such as Facebook, Twitter, and LinkedIn are free to join and often attracted by Generation Y members and are therefore increasingly used by organizations for recruitment purposes (Doherty, 2010).

It is established in a study that recruitment is one of the main activities of human resource management (HRM) deeply affected by the rapid development of social media which opens up new opportunities for businesses in attracting talent to their organization(Girard, Fallery and Rodhain, 2014). Academics and practitioners found that in next few years all human resource (HR) departments will increase their utility of social networks which will be convenient for organizations in recruitment process and identifying potential candiadates. (Fisher, 2014). According to Ritter (2015) the social media has transformed human lives as well as the patterns in which businesses are being done. Social recruitment is one of the main reasons for which many businesses are relying on social media channels for several purposes globally. According to researchers, human capital is a crucial resource of an organization's competitiveness and hiring the best talent is a main straegy toward building a sustainable competitive advantage (Cable and Turban, 2003; Francois, d'Astous and Grégoire, 2014).

In a survey conducted by Jobvite Social Recruiting Survey(2012) it was found that 92% of job recruiters currently use or plan to use social media in order to recruit employees.they surveyed that specifically, 92% use LinkedIn, 66% recruit on Facebook and 54% organizations search for employees through Twitter.

In a study by Russo (2011), importance of using social media for recruitment purposes it was found out that in times of economic depressions and high unemployment rates in most of nations "job hunting has become a second career for many people and it's no surprise that in a number of fields, particularly for entry-level positions, the search for a new job is being conducted almost exclusively online" (Russo, 2011).

According to Zottoli & Wanous, (2000), those recruitment sources which provide more accurate information are found to be more effective as they allow the potential applicants to have a better understanding the job to be performed. The factualness of the information on a recruitment source increases the quality and number of those who apply to have their expectations met after joining the organization as an employee.

Trustworthiness is found as an important factor among others according to which whether information from an online source of information be utilized by potential applicants for employment is decided. Trustworthiness of an information source refers to the degree to which the target audience believes that the source is unlikely to deceive (Mayer, Davis, &

Schorman, 1995) as it is an important factor in building and maintaining relationships in the online environment (Cheung & Lee, 2006). Bohmova and Pavlicek (2015) in their research findings confirm the rising importance of social networking sites usage as technological intervention of a new recruiting strategy. (Bohmova and Pavlicek, 2015). Further, Mumford(2012) found in a research that perception of potential applicants of level of trustworthiness has been found to vary by recruitment source and were related with intentions to utilize a recruitment source when looking for employment information from a particular source (Mumford, 2012). In a study, Galanaki (2002) found about the authenticity and safety of information that the personal information obtained through the Internet must be properly regulated and safeguarded in recruiting through social media (Galanaki, 2002). The proposed research paper would focus on utilization of social media for recruiting and its potential outcomes.

OBJECTIVES OF THE STUDY

The main objectives of the study can be stated as below:

- To study the students perception about the social media for online recruitment and acquisition of talent by the organisation.
- To study the perceptual differences of student towards using social media for online recruitment for talent acquisition among undergraduates and postgraduate students

HYPOTHESES

In order to fulfil the above objectives of the study, the researcher has framed the following hypotheses:

H01- The uses of social media for online recruitment for talent acquisition does not differ significanty across gender categories of respondents.

H02- The uses of social media for online recruitment for talent acquisition does not differ significanty across undergraduates and postgraduate students.

RESEARCH METHODOLOGY

The research design to study the present research is descriptive in nature. The objective is to study and analyse the impact on perception of students of using social media for online recruitment as a talent acquisition strategy   across genders and different levels of courses (undergraduates and postgraduate students). .

The data have been collected from both primary and secondary sources for the purpose. The   secondary data for the study was collected from different sources such as technical and trade journals, articles, newspapers, magazines, internet, periodicals, books, reports and other   publications.   For collecting primary data, a well structured questionnaire was used in the present study. The researcher have developed questionnaire   for data collection related to ten dimensions of using online media which have also been identified through immense literature review from secondary data   on five point Likert's Scale wherein, 1 being least important and 5 being most important. The respondents were required to rate these dimensions on the basis of their perceived importance on recruitment and talent acquisition process of organization. The questionnaire was piloted on 400 students of undergraduate and postgraduate courses using convenient sampling techniques. The collectd data was edited, coded, tabulated and appropriate analysis was carried out.

Data Analysis and Interpretation

Along with the usual statistical tools such as tables, percentages, one way ANOVA used for analyzing the data which helps in arriving conclusions.

Table 1: One Way ANOVA of means of student perception of different dimension of social media preference across gender categories of respondents

		Sum of Squares	Df	Mean Square	F	Sig.
Preference of recruitment source	Between Groups	.416	1	.416	.352	.553
	Within Groups	481.065	407	1.182		
	Total	481.482	408			
Trustworthiness	Between Groups	1.255	1	1.255	1.209	.272
	Within Groups	422.183	407	1.037		
	Total	423.438	408			
Factualness	Between Groups	.185	1	.185	.171	.679
	Within Groups	441.189	407	1.084		
	Total	441.374	408			
User friendly interface	Between Groups	.123	1	.123	.119	.730
	Within Groups	420.630	407	1.033		
	Total	420.753	408			
Options for Responsiveness to applicant	Between Groups	.612	1	.612	.465	.496
	Within Groups	536.219	407	1.317		
	Total	536.831	408			
Quantity of Content Provided	Between Groups	.208	1	.208	.190	.663
	Within Groups	443.924	407	1.091		
	Total	444.132	408			
Quality of Content Provided	Between Groups	1.283	1	1.283	1.127	.289
	Within Groups	463.548	407	1.139		
	Total	464.831	408			
Brand of Organization	Between Groups	2.767	1	2.767	2.265	.133
	Within Groups	497.224	407	1.222		
	Total	499.990	408			
Authenticity of Recommendations and Reviews	Between Groups	.149	1	.149	.118	.732
	Within Groups	513.773	407	1.262		
	Total	513.922	408			
Followers	Between Groups	.788	1	.788	.697	.404
	Within Groups	460.458	407	1.131		
	Total	461.247	408			

Here, the null hypothesis is accepted ($p > 0.05$) for the results obtained as all the dimensions have shown the value above the value of significance level. Thus, it was found in the study that no significant difference was explored on perception of students of using social media and corporate websites for online recruitment as a talent acquisition strategy across genders.

The following table presents the results of one way ANOVA applied across courses i.e., study across different levels of courses (undergraduate students and post graduate students)

Table 2: One Way ANOVA of means of student perception of different dimension of social media preference across students of Undergraduate and post graduate study programs

		Sum of Squares	Df	Mean Square	F	Sig.
Preference of recruitment source	Between Groups	11.691	1	11.691	10.129	.002
	Within Groups	469.790	407	1.154		
	Total	481.482	408			
Trustworthiness	Between Groups	18.631	1	18.631	18.732	.000
	Within Groups	404.806	407	.995		
	Total	423.438	408			
Factualness	Between Groups	18.066	1	18.066	17.370	.000
	Within Groups	423.308	407	1.040		
	Total	441.374	408			
User friendly interface	Between Groups	1.537	1	1.537	1.492	.223
	Within Groups	419.216	407	1.030		
	Total	420.753	408			
Options for Responsiveness to applicant	Between Groups	10.767	1	10.767	8.330	.004
	Within Groups	526.064	407	1.293		
	Total	536.831	408			
Quantity of Content Provided	Between Groups	1.884	1	1.884	1.734	.189
	Within Groups	442.248	407	1.087		
	Total	444.132	408			
Quality of Content Provided	Between Groups	2.944	1	2.944	2.594	.108
	Within Groups	461.888	407	1.135		
	Total	464.831	408			
Brand of Organization	Between Groups	3.838	1	3.838	3.148	.077
	Within Groups	496.152	407	1.219		
	Total	499.990	408			
Authenticity of Recommendation and Reviews	Between Groups	5.942	1	5.942	4.761	.030
	Within Groups	507.980	407	1.248		
	Total	513.922	408			
Followers	Between Groups	3.689	1	3.689	3.281	.071
	Within Groups	457.558	407	1.124		
	Total	461.247	408			

In the above table, the dimensions of the study have shown both values. It can be found that Preference of recruitment source, trustworthiness, factualness, level of Responsiveness to applicants, and authenticity of recommendations and reviews are found to have significant difference across the level of students with a value of significance below <.05 whereas other dimensions have value higher than >.05. Two dimensions, the organization brand and the followers have values near to 0.07 which can be found slightly significant whereas other three dimensions have very high value than 0.05. Thus, in this case null hypothesis can be taken as rejected across different levels of courses (undergraduate students and post graduate students).

CONCLUSION

According to the present study, social media is a strategy to reach large amount of people quickly and cost-efficiently. Social media must be used as a strategy of recruiters to attract

talent and acquire them. Social recruitment requires a well framed strategic plan to be able to acquire talented workforce to the organization. Different social media mix must be used along with corporate website to enhance authenticity of information provided by organization and to enable to reach people. More emphasis must be given on quality as well as quantity of content provided by the institutions to reach potential candidate. Also, care should be taken in creating more user friendly social media pages and company website so that applicant find the required instructions and guidance easily to apply for a job in an organization. Thus, HR managers must develop recruitment process in which the social media must play a vital role in free interaction and higher accessibility to recruit competent workforce as a competitive advantage over others.

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FACTORS INFLUENCING PURCHASE DECISION MAKING OF SOLAR PANELS: A STUDY

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ABSTRACT

The objective of this study was to check the Factors Influencing Purchase Decision Making among solar photovoltaic panel consumers in India. Data was collected through a structured questionnaire given to 100 customers. Data analysis was done through regression with the help of the 100 responses received. The study found that factors, viz. dependent factor was solar panel purchase choice and independent factors were Age, gender, income, marital status, occupation, academic qualification, Awareness, cost savings, and environmental consciousness have significant relationship in decision making process. The findings of the study and the implications are discussed here.

KEYWORDS: Solar energy, conventional and Non-conventional energy

INTRODUCTION

Energy was generated through two sources viz., conventional or Non-renewal energy source and Non- conventional or renewal energy source. Conventional or Non-renewal energy sources include fossil fuel, oil, gas and coal. It pollutes environment. Non-conventional or renewal energy sources includes solar, wind, ocean, hydropower etc. The country's solar installed capacity reached 20 GW in February 2018. There huge potential growth for solar power due to increase in temperature in India. Current union government was emphases on develop solar energy to solve electricity problem in India. This has percolated into rural areas in 17 states. Government offering subsidies to manufactures to encourage production and distribution of solar energy sector in India. Manufacture of solar panels (also called modules) start with polysilicon, which is made from silicon. There were 11 companies manufacture solar module cells. BHEL, Central Electronics Limited, Euromultivision, Indosolar, Moserbaer solar, PLG solar, Websol, Udhaya energy photovoltaics, Tata solar power, USL photovoltaics limited and XL energy.

RESEARCH QUESTION

Was there any relationship between the Factors Influencing Purchase Decision Making among solar photovoltaic panel consumers in India?

REVIEW OF LITERATURE

Bhuvaneshwari.V and Srija.M (2014) studied customer preference towards solar products in India. They concluded that occupation, income and number of products have significant

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influence on purchase of solar products and age, gender & educational level have insignificant influence on purchase of solar products.

Annie Yong Ing Ing et.al (2017) examined customer perception towards renewable energy in Malaysia. They concluded that global and economic factor, perceived price & personal characteristics have significant influence on Consumers' Perception toward renewable energy and perceived product benefits had insignificant influence on Consumers' Perception toward renewable energy.

RanjitKumar Siringi(2012) identified Determinants of Green Consumer Behavior in India. He concluded that eight factors influence consumer behaviour i.e., Energy Saving, Eco-label and Need for environmental information, Shopping Behaviour, purchasing behaviour, Purchase criteria, preference of green outlet, and Awareness of green outlets have significant influence.

RESEARCH GAP

The previous studies have done comparisons of personal factors influencing buying behaviour of solar photovoltaic panel between buyer and non-buyer but none of them have compared factors such as environmental friendliness, cost saving and awareness influencing buying behaviour of solar photovoltaic panel. None of studies were conducted in Hyderabad city.

HYPOTHESIS

There is no significant relationship between factors of buyer and Non-buyer of solar panel.

RESEARCH METHODOLOGY

NEED FOR THE STUDY

The study was conducted to determine relationship between personal Factors, Awareness factors, Cost savings, Environmental friendliness Influencing Purchase Decision Making among solar photovoltaic panel consumers in India. it helps corporates to take better decision making.

OBJECTIVES OF THE STUDY

The study was conducted to determine relationship between personal Factors, Awareness factors, cost savings factors and environmental friendliness factors Influencing Purchase Decision Making among solar photovoltaic panel consumers in India.

STUDY SITE

The study was conducted in the Hyderabad city of Telegana state, India

NATURE OF STUDY

The study was purely explorative and conclusive in nature.

DATA COLLECTION METHOD

The study took into consideration both secondary as well as primary data. The primary data was collected through a set of structured questionnaires and the secondary sources consisted of review of websites, books and standard journals.

THE QUESTIONNAIRE DEVELOPMENT

Initially the rough-cut of questionnaires was developed through polite interactions with local customers and dealers in the solar panel market. Thereafter, the closed-ended questionnaires were designed and fine-tuned in two parts. The first part consisted of general questions related to Name, Address, Age, Gender, Income Level, Occupation, academic qualification and marital status. The second part related to Purchase of Solar panel, Company name, Awareness, cost saving and environmental friendliness. Likert's scale was used.

SAMPLE SIZE

The sample of the study consisted of 100 respondents to whom the structured questionnaires were distributed for Data Collection of which only 100 samples were considered were Buyer and Non-Buyers.

THE DESCRIPTION OF VARIABLES

Solar panel purchase choice: It was a dependent factor, solar panel purchase choice i.e., buyer and non-buyer. Binary digit was used for converting qualitative data in quantitative data by indicating buyer as one and non-buyer as zero.

Age: It was an independent factor. Age group of the respondent. The customers had opted for solar panel purchase choice. Nominal scale was used for converting quantitative data by indicating, score from one to five; Group-I- 21 to 30 years, Group-II- 31-40, Group-III-41-50, Group-IV-51-60 and Group-V- above 60.

Gender: It was an independent factor. Gender, of buyer and non-buyer. Binary digit was used for converting qualitative data into quantitative data by indicating male as one and female as two.

Occupation: It was an independent factor. Respondent's occupation i.e., buyer and non-buyer. Nominal scale was used for converting quantitative data by indicating, score from one to five; Group-I- Self employed, Group-II- professional, Group-III-private, Group-IV-government services and Group-V- others.

Income: It was an independent factor. Customer's Disposal income was grouped (i.e., buyer and non-buyer). Nominal scale was used for converting quantitative data by indicating, score from one to four; Group-I- less than 5,00,000, Group-II-5,00,000-750,000, Group-III-7,50,000 to10,00,000, Group-IV- above 10,00,000.

Marital Status: It was an independent factor. Marital status of respondent (i.e., buyer and non-buyer). Binary digit score was used for converting qualitative data in quantitative data by indicating married as one and single as zero.

Awareness: It was an independent factor. Awareness ranked by the customers (i.e., buyer and non-buyer). Nominal scale was used for converting quantitative data by indicating, score from one to five; Group-I- Strongly disagree; Group-II- Disagree; Group-III- neither agree nor disagree, Group-IV- agree, and Group-V- strongly agree. Awareness consists of awareness of products, awareness of company's offers of products, aware of usage of products, aware of place services and aware of price. The average of these five questions, awareness was considered.

Cost Efficient: It was an independent factor. Cost Efficient ranked by the respondents i.e., buyer and non-buyer. Nominal scale was used for converting quantitative data by indicating, score from one to five; Group-I- Strongly disagree; Group-II- Disagree; Group-III- neither agree nor disagree, Group-IV- agree, and Group-V- strongly agree. Cost Efficient consists of cost of installation, cost of maintenances, and cost of spares & services. The average of these three questions, Cost Efficient was considered.

Environmental friendly: It was an independent factor. Environmental friendly ranked by the respondents i.e., buyer and non-buyer. Nominal scale was used for converting quantitative data by indicating, score from one to five; Group-I- Strongly disagree; Group-II- Disagree; Group-III- neither agree nor disagree, Group-IV- agree, and Group-V- strongly agree. Environmental friendly consists of willingness to use natural source (sunlight), natural available source (sunlight) plenty, willingness to spend extra cost to protect nature and not harmful to environment. The average of these four questions, awareness was considered.

SAMPLING PROCEDURE

The respondents were selected within the specified strata, based on their convenience and cooperation.

THE FIELD WORK

The questionnaires were given to customers in the Hyderabad District and interviews & schedules were conducted.

STATISTICAL TOOLS USED

The following study tools were used: Descriptive Statistics, regression analysis, t-test and Reliability and Validity tests.

PERIOD OF THE STUDY:

The survey was conducted from September to December, 2017.

LIMITATION OF THE STUDY:

Study was conducted within the Hyderabad district and with a sample of 100 respondents only.

DATA ANALYSIS AND INTERPRETATION:

Table 1: Individual Demographic Factors and Solar Panel purchase Details

	N	%		N	%
Gender			Marital status		
Male	66	66	Married	95	95
Female	34	34	Single	5	5
Age			Occupation		
21-30	1	1	Self employed	12	12
31-40	26	26	Professional	15	15
41-50	68	68	Private employee	56	56
51-60	3	3	Government service	1	01
above 60	2	2	Others	16	16
Income Levels			Academic Qualification		
Less than 5,00,000	45	45	School	17	17
5,00,000-7,50,000	52	52	Degree	43	43
7,50,000-10,00,000	68	68	PG	26	26
Above 10,00,000	5	5	PG above	14	14

Table 2: Individual Demographic Factors, Mean and Standard Deviation

Sl. No.	Variables	Solar Panel (N=100)	
		Mean	Std. Deviation
1	Age	2.79	0.608
2	Gender	1.36	0.542
3	Income	2.77	0.548
4	Marital Status	0.95	0.219
5	Occupation	2.94	1.135
6	Qualification	2.37	0.928
7	Awareness	3.40	0.711
8	Cost Saving	3.62	0.763
9	Environmental friendly	3.5	0.732

The following regression model is used for testing the hypothesis:

Solar Panel Purchase Choice $= \alpha + \beta_1 Age + \beta_2 Gender + \beta_3 Income + \beta_4 Marital status + \beta_5 Occupation + \beta_6 Academic Qualification + \beta_7 Awareness + \beta_8 Cost Savings + \beta_9 Environmental Friendly + Error$

Table 3: Showing regression statistics:

Regression Statistics					
Multiple R			0.624		
R Square			0.389		
Adjusted R Square			0.328		
Standard Error			0.377		
Observations			100		
ANOVA					
	Df	SS	MS	F	Significance F
Regression	9	8.178	0.909	6.378	0.0000001
Residual	90	12.822	0.142		
Total	99	27.794			
	Coefficients	Standard Error		t Stat	P-value
(Constant)	1.573	0.356		4.412	0.000
Age	0.273	0.297		0.918	0.361
Gender	0.028	0.072		0.393	0.696
Income	-0.345	0.333		-1.036	0.303
Marital Status	-0.100	0.183		-0.545	0.587
Occupation	-0.133	0.038		-3.527	0.001*
Qualification	-0.171	0.049		-3.524	0.001*
Awareness	-0.59	0.084		-0.704	0.483
Cost Saving	0.213	0.102		2.088	0.040*
Environmental friendly	-0.113	0.084		-1.353	0.180

HYPOTHESIS TESTING

The present study showed the statistical significance value for the intercept. Regression using F statics was significant, R2 is 38.4%, and thus goodness of fitness this model did suffer from any limitation. It showed a significant relationship between the variables (explanatory and independent).

1. AGE:

Age influenced purchase decision making. Young respondents adapt to technology more than aged. It showed p-value was 0.361 was greater than 0.05 and t-value was 0.918 less than 1.96, level of significance, the null hypothesis was accepted. There was a no significant relationship between age of buyer and Non-Buyers.

2. GENDER:

Gender influenced purchase decision making. Male respondents adapt to technology more than Females. It showed p-value was 0.696 was greater than 0.05 and t-value was 0.393 less than 1.96, level of significance, the null hypothesis was accepted. There was a no significant relationship between gender of buyer and Non-Buyers.

3. INCOME:

Income influenced purchase decision making. Higher disposal income of respondents adapt to technology more than low income. It showed p-value was 0.303 was greater than 0.05 and t-value was 1.036 less than 1.96, level of significance, the null hypothesis was accepted. There was no significant relationship between income of buyer and Non-Buyers.

4. MARITAL STATUS:

Marital status influenced purchase decision making. Married respondents adapt to technology more than unmarried. It showed p-value was 0.587 was greater than 0.05 and t-value was 0.545 less than 1.96, level of significance, the null hypothesis was accepted. There was a no significant relationship between marital status of buyer and Non-Buyers.

5. OCCUPATION:

Occupation influenced purchase decision making. Professional adapt to technology more than others. It showed p-value was 0.001 was lesser than 0.05 and t-value was 3.527 greater than 1.96, level of significance, the null hypothesis was rejected. There was a significant relationship between occupation of buyer and Non-Buyers.

6. QUALIFICATIONS:

Qualifications influenced purchase decision making. Higher person educated adapt to technology more than less educated. It showed p-value was 0.001 was lesser than 0.05 and t-value was 3.524 greater than 1.96, level of significance, the null hypothesis was rejected. There was a significant relationship between occupation of buyer and Non-Buyers.

7. AWARENESS:

Awareness influenced purchase decision making. Awareness respondents adapt to technology more than unaware. It showed p-value was 0.483 was greater than 0.05 and t-value was 0.704 less than 1.96, level of significance, the null hypothesis was accepted. There was a no significant relationship between Awareness of buyer and Non-Buyers.

8. COST SAVING:

Cost Saving influenced purchase decision making. Higher cost saving adapt to technology more than less cost saving. It showed p-value was 0.04 was lesser than 0.05 and t-value was 2.088 greater than 1.96, level of significance, the null hypothesis was rejected. There was a significant relationship between cost saving of buyer and Non-Buyers.

9. ENVIRONMENTAL FRIENDLINESS:

Environmental friendliness of the equipment also influenced purchase decision making. Environmental friendly respondents adapt to technology more than unaware. It showed p-value was 0.18 was greater than 0.05 and t-value was 1.353 less than 1.96, level of significance, the null hypothesis was accepted. There was a no significant relationship between Awareness of buyer and Non-Buyers.

CONCLUSION

Since the aim of this study was to check the Factors Influencing Purchase Decision Making among solar panel consumers in India. Data was collected through a structured questionnaire given to 100 customers. Data analysis was done through regression with the help of the 100 responses received. The study found that factors, viz. dependent factor was

solar panel purchase choice and independent factors were Age, gender, income, marital status, occupation, academic qualification, Awareness, cost savings, and environmental consciousness have significant relationship in decision making process. Occupation, Qualification and Cost Saving had statistical significant relationship between buyer and Non-buyer. Age, gender, income, marital status, Awareness, and environmental consciousness had significant relationship between buyer and Non-buyer.

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TOWARDS A PREDICTIVE MODEL FOR EFFECTIVE E-WASTE MANAGEMENT BASED ON RULES AND REGULATIONS: A STUDY OF SOFTWARE INDUSTRY IN INDIA

ABSTRACT

In last few year, information technology has seen tremendous growth all over the world. This growth has also brought a new kind of waste known as electronic waste or e-waste. The amount of this electronic waste is growing rapidly due to fast change in technology, reducing prices of electronic devices, low recycling rate of e-waste. This growing volume of e-waste is not only very harmful for human health and environment but also lead to resource depletion. So, its important to manage this e-waste effectively. The study was designed with an objective to predict the model for effective e-waste management based on factors identified from literature related to rules and regulations in Software industry. A total of 336 Software Developers of Software industry participated in the survey. A classification algorithm J48 was employed using WEKA and predictive model in the form of decision tree was developed.

KEYWORDS: Recycling, e-Waste, Reuse, Collection, software industry, WEEE (Waste Electrical and Electronic Equipment.

INTRODUCTION

E-waste management in developing countries is a big challenge on account of poor legislation, lack of awareness about hazardous nature, poor infrastructure for take back and recycling of e-waste. In most of the developing countries due to absence of legislation recycling of e-waste limited to private recycling with very less participation of consumer (Susan et al., 2008). Trans-boundary movements of huge amount of e-Waste from developed countries to developing countries (Wen et al., 2006), lack of legislation around e-Waste (Roa, 2007), dumping e-Waste into landfills, terrible working conditions for workers (Hanks et al., 2008), rigorous controls to prevent the illegal import and export of e-Waste (Rolf et al., 2005) and lack of relevant laws to adjust or control the selling behaviors of waste electric and electronic equipments (Wen et al., 2006) are some important drivers for effective e-Waste management.

Literature says that building blocks of rules and regulation related to e-waste management is known in different countries but how many of those are applicable in India are not known. So its important to know what will be the building blocks of rules and regulation related to e-waste management practices in India. Thus paper attempts to predict an model of rules and regulation related to e-waste management in Indian software industry.

LITERATURE REVIEW

The EPR (Extended Producer Responsibility) concept was defined by Lindhqvist (2000),

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the objective of that concept was to make the manufacturer responsible for the whole life cycle of the product start from takeback, recycling to final disposal.

It has been observed that in most of the countries e-waste generated by businesses, institutons and government are stored in their storehouses. Only small portion of that e-waste sent to formal recyclers or donate to rural areas (Nie Y., 2003). In 1998 country like Taiwan and China enforced legislation for the take-back of four household appliances which include TV, Air conditioner, washing machine and refrigerator (Cai Y, Jiang B, 2002). In many countries people involved in recycling process of e-waste are getting average salary less than 3.63 USD per day (Sun Yat-sen University and Greenpeace, 2003).

Many developed countries have developed various rules and regulation from time to time to save environment and human health. In 2003 European parliament and council release document which focus on the restriction of hazardous substances like lead, mercury etc. in electrical and electronic equipments to minimize the risk during treatment and disposal of e-waste. Another directive was release in 2005 which focus on to reduce the generation of e-waste and encourage reduce and reuse of electronic equipments.

Initially there was no separate law for e-waste management in India. E-waste was interpreted under the rule of Hazardous waste and recycling facilities licensed under these rules. On 11th May, 2011 Ministry of Environment and Forests (MOEF) and Central Pollution Control Board (CPCB) release the document for environmentally sound e-waste management.

Author's contribution related to rules and regulations for e-Waste management are shown in Table I and Table II.

Table I: Literature Review related to Rules and Regulations

Author, Year	Contribution
DTSC, 2003	California banned the disposal of CRT(Cathode ray tube) and CED (consumer electronic devices) through landfills and incineration.
EU-EC Directive, 2003	In 2002 legislation related to the recycling of WEEE introduced.
GAO, 2005	Paper discussed about the development of rules and regulations related to recycling of e-waste.
Liu et al., 2006	Chinese government isuues many policies to restrict illegal import and informal recycling.
Gregory et al., 2007	The California has passed the law to charge Advanced Recycling Fees (ARFs) at the time of product purchase.

Table II: Literature Review related to the Rules and Regulations in different context

Author, Year	Objective	Context	Finding
Wen et al., 2006	This paper introduces the current status of e-waste flow and recycling technologies.	China	Management policies play an important tole to promote sustainable e-waste managment practices.
Streicher-Porte et al., 2007	The comparative study of cost involed in the collection and transport of five products were discussed in this paper.	China	The paper concluded that in exixting framework of policy recyclers can not win over onformal recyclers until formal recycling become more cost efficient.

In India, 65 cities are generating about 65% of the e-waste. Top ten e-waste generating cities are Delhi, Banglore, Ahmedabad, Mumbai, Chennai, Kolkata, Ahmedabad, Hyderabad, Surat, Pune, and Nagpur (Chatterjee, 2007).

India is not only generating its own e-waste, its also getting lots of e-waste lands from the developed countries in the form of second hand goods (Toxics Link, 2004).

The major reasond for this import are less strict environment laws and less cost of labor (Ragupathy, 2006). One of the major reason of e-waste of PC scrap was import in India (IRGSSA, 2004).

RESEARCH GAP AND RESEARCH PROBLEM

Existing literature shows that the building blocks of rules and regulations related to effective e-Waste management is known in different countries but how many of these are applicable in India are not known. This paper attempts to bridge this research gap.

RECOGNITION OF VARIABLES

The following superset of variables, as shown in Table 3, was established from the literature survey that formed the building blocks of rules and regulation related to e-Waste management. The explanation of the variables are mentioned below:

i)   Illegal import: Adequate regulation to prevent the illegal import and export of e-waste is an important factor for effective e-waste management.

ii) Safe disposal: Adequate regulation for safe disposal of e-waste is an important factor for effective e-waste management.

iii) Working conditions of workers: Adequate regulation for workers involved in recycling is an important factor for effective e-waste management.

iv) Restrict dumping: Adequate regulation to restrict unsafe dumping of e-waste is an important factor for effective e-waste management.

v)   Selling behaviors of e-Waste: Regulating the sale of e-waste will improve e-waste management.

Table III: Variable identified from literature

Rules and Regulations	Illegal import (var1),	Rolf et al., 2005 Wen et al., 2006
	Safe disposal (var2),	Roa, 2007; Hanks et al., 2008;
	Working conditions of workers (var3),	Susan et al., 2008
	Restrict dumping (var4),	
	Selling behaviors of e-Waste (var5)	

OBJECTIVE OF THE STUDY

To predict a model from the building blocks of rules and regulation related to e-waste management identified from literature.

RESEARCH QUESTION

What are the factors contributing to the effective rules and regulation related to e-waste management in India?

RESEARCH MODEL

Based on the nature of the study and audience of the study quantitative model was used. The data is collected from the respondent by using questionnaire as an instrument, the collected data is analysed using WEKA datamining tool, To predict a model from the building blocks of rules and regulation related to e-waste management.

RESEARCH METHODOLOGY

Based on the literature study related to rules and regulations required for effective e-waste management, factors were identified. On these variables a J48 classification algorithm is used to predict model for effective e-waste management related to rules and regulation. The result of the quantitative input is summarized.

SAMPLING

Convenience sampling was done from the higher education institutes and software companies located in Mumbai, NCR, Chennai, Bangalore, Uttarakhand and other part of India. A structured questionnaire was developed and responses from the Top managers, and Software developers of software industry were taken.

DATA COLLECTION

Total 350 responses collected from the the respondent among which few of them found incomplete. Incomplete questionnares were not considered for analysis. Total 336 responses were found complete and considered for analysis. Cronbach's alpha test was used to test the validity and reliability of the questionnaire. Items having ? value found greater than 0.7 (Hair et al., 2011)

MODEL FOR DATA ANALYSIS

The analysis of the collected data using classification algorithm of data mining was done on the software WEKA. The predictive model shown in Fig. 1 found that variable 1 and variable 4 value greater than 4 supported by 212 respondent.

DATA ANALYSIS AND RESULTS

Researcher has used a series of statistical tools and procedures to analyze the collected data. To develop an authentic e-Waste management measurement scale, researcher has made an assessment of the reliability of constructs. Finally, J48 classification algorithm were run to predict the model for rules and regulation related to e-waste management.

Figure I: Predictive model for rules and regulation
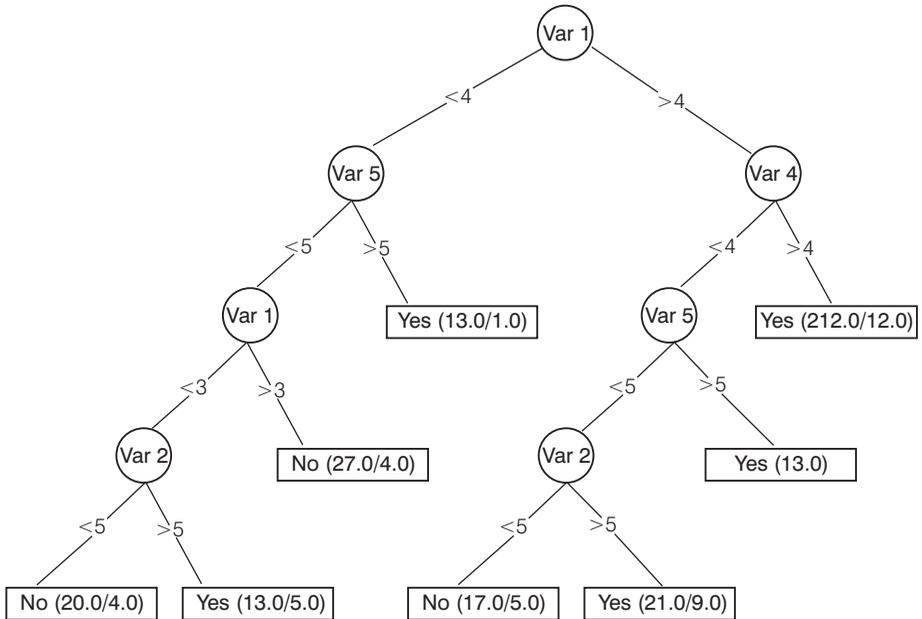
The model predict that when variable1(illegal import) and variable4 (restrict dumping) value greater than 4 (agree) then 212 respondent support or lead to effective e-waste management in the software industry of India. Hence, the model predict that by developing or implementing rules and regulation which focus on to restrict illegal import of e-waste and restrict dumping of e-waste will lead to effective e-waste management.

There were five variables of rules and regulations related to e-Waste management in software industry among which two of them were accepted. Thus 'illegal import', and 'restrict dumping' are the predictor of effective e-Waste management. Three of the variables could not be supported in the study these are 'Safe disposal', 'Working conditions of workers' and 'Initiatives'. The hypotheses 'Collection and recycling', 'Awareness, and 'Selling behaviors of e-Waste' are not the predictor of effective e-Waste management.

CONCLUDING REMARKS

Existing literature shows that the building blocks of rules and regulations related to effective e-Waste management is known in different countries but how many of these are applicable

in India are not known. This study was designed with an objective to predict the model for effective e-waste management based on factors identified from literature related to rules and regulations   in Software industry. A total of   336 Software Developers of Software industry participated in the survey. A classification algorithm J48 was employed using WEKA and predictive model in the form of decision tree was developed. The model predict that when variable1(illegal import) and variable4 (restrict dumping) value greater than 4 (agree) then 212 respondent support or lead to effective e-waste management in the software industry of India. Hence, the model predict that by developing or implementing rules and regulation which focus on to restrict illegal import of e-waste and   restrict dumping of e-waste will lead to effective e-waste management.

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FOOD SAFETY AND STANDARD AUTHORITY OF INDIA (FSSAI): A DEMEANOUR FOR SAFETY OF FOOD IN INDIA.

ABSTRACT

Today's major concern for all the nations across the world is emerging food safety risks. These risks are now internationally recognized by governments in all food production and distribution systems. To provide safe food and to meet the challenges to all needs, pro-active approach of improved strategies and proper food safety legislation is required. As per the provisions of the Food Safety and Standard Act (FSS) (2006), food safety standards are to be harmonized with International best practices so that there are no qualitative restrictions on trade in food. Based on interactions with International resources, appropriate models were adopted with modifications to suit Indian conditions. This paper discusses Food Safety and Standards Authority of India (FSSAI) enforcing Food Safety & Standards Act, in India uniformly to ensure consumer safety. The present paper also discusses about innovations with special focus on self regulation, which will reduce the load on regulatory authorities and make food safety more feasible.

KEY WORDS: Food Safety and Standards Authority (FSSA), Food Safety and Standard Authority of India (FSSAI), International perspectives, Policies, Prevention of food adulteration (PFA).

INTRODUCTION

Food is considered one of the basic necessities for sustenance of life. Pure, fresh and healthy diet is most essential for the health of the community. It is well said that community health is national wealth. Adulteration of food-stuffs is so persistent that nothing short of a somewhat drastic remedy in the form of a comprehensive legislation had become the need of the hour. To check this kind of anti-social evil, a concerted and determined onslaught was launched by the Government by introduction of the Prevention of Food Adulteration Bill in the Parliament to herald an era of much needed hope and relief for the consumers at large (www.medindia.net/indian_health_act/acts.asp). For the prevention of adulteration of food, the first law which enacted in the year 1954 was Prevention of Food Adulteration Act (Enforcement of FSS Act, FSSAI, 2012). The provisions of this Act are mandatory and contravention of the Act and Rules made there under can lead to imposition of fine and imprisonment (www.mofpi.nic.in/EOI).

HIGHLIGHTS OF THE FOOD SAFETY AND STANDARD ACT, 2006

The main aim to establish an Act related to safe food is to provide one single place of command and control. Act establishes an independent statutory Authority - the Food

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Safety and Standards Authority of India with head office at Delhi, that enforces various provisions of the Act. Different kinds of acts related to safety of food before Food safety and Standard Act (2006) are shown in table 1. These acts abolished after commencement of FSS Act, 2006 (Food Safety and Standards (Packaging and Labeling) Regulations, 2011). Food Safety and Standards Authority of India (FSSAI) and the State Food Safety Authorities are now implemented for safety of food (www.swaniti.in).

Table 1: Various Acts and year

S. No.	Name of Act	Year of formation
1.	Prevention of Food Adulteration Act	1954
2.	Fruit Products Order	1955
3.	Meat Food Products Order	1973
4.	Vegetable Oil Products (Control) Order	1947
5.	Edible Oils Packaging (Regulation)Order	1988
6.	Solvent Extracted Oil, De- Oiled Meal and Edible Flour (Control) Order	1967
7.	Milk and Milk Products Order	1992

THE FOOD SAFTEY AND STANDARD AUTHORITY OF INDIA (FSSAI)

Food Safety and Standards Authority of India (FSSAI) has been established under Food Safety and Standards Act, 2006 which combines various acts, rules and regulations that have hitherto handled various food related problems/issues in Ministries and Departments. FSSAI has been known for its science based standards, testing and regulations for any food material. In this law food of different varieties are regulated at various steps which majorly are their manufacturing, storage, distribution, sale, testing, packaging, transport and import to ensure safe and wholesome food for human consumption which is shown in fig. 1 (www.fssai.org.in).

Fig. 1: Various steps taken by FSSAI for the safety of food.
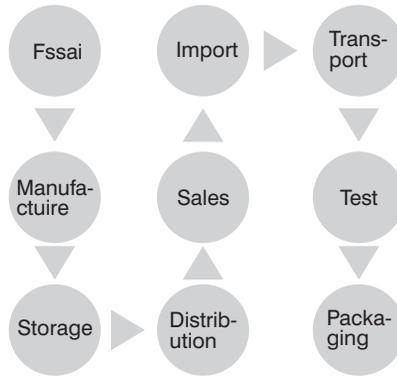
FUNCTIONS OF FSSAI

FSSAI has been mandated by the FSS Act, 2006 for performing the following functions:

- Framing of Regulations to lay down the Standards and guidelines in relation to articles of food and specifying appropriate system of enforcing various standards thus notified.

- Laying down mechanisms and guidelines for accreditation of certification bodies engaged in certification of food safety management system for food businesses.

- Laying down procedure and guidelines for accreditation of laboratories and notification of the accredited laboratories.

- To provide scientific advice and technical support to Central Government and State Governments in the matters of framing the policy and rules in areas which have a direct or indirect bearing of food safety and nutrition.

- Collect and collate data regarding food consumption, incidence and prevalence of biological risk, contaminants in food, residues of various, and contaminants in foods products, identification of emerging risks and introduction of rapid alert system.

- Creating an information network across the country so that the public, consumers, Panchayats etc receive rapid, reliable and objective information about food safety and issues of concern.

- Provide training programmes for persons who are involved or intend to get involved in food businesses.

- Contribute to the development of international technical standards for food, sanitary and phyto-sanitary standards.

- Promote general awareness about food safety and food standards.

ESTABLISHMENT OF THE AUTHORITY

Ministry of Health & Family Welfare, Government of India is the Administrative Ministry for the implementation of FSSAI. The Chairperson and Chief Executive Officer of Food Safety

and Standards Authority of India (FSSAI) have been appointed by Government of India. The Chairperson is in the rank of Secretary to Government of India.

MEMBERS OF FSSAI: The head office of FSSAI is in Delhi. It consists of a chairperson and 22 members. Out of which one-third would be women candidates. 7 members appointed by the Central Government dealing with Agriculture, Commerce, Consumer affairs, Food processing, Health, Legislative affairs, small scale industries, not below the rank of Joint Secretary to the Government of India. There are 5 members in rotation to represent the state and union territories, 2 each from the food industries, Consumer organization, Farmers' organizations, 3 from Food technologists or scientists and one member from Retailers' organizations ((Fig. 2, table 2).

Table 2: Members of Fssai

S. No.	Total members	Specific areas
1.	1	Chairman
2.	7	1. Agriculture 2. Commerce 3. Consumer affairs 4. Food processing 5. Health 6. Legislative affairs 7. Small scale industries
3.	5	In rotation to represent the state and union territories
4.	3	Food technologists or scientists
5.	2	Food industries (one from small scale industries)
6.	2	Consumer organization
7.	2	Farmers' organizations
8.	1	Retailers' organizations

FIG. 2: Head office of Fssa

HEAD OFFICE

FDA Bhawannear Bal Bhavan, Kotla Road, New Delhi - 110002 India.
EPABX011-23236975
Telefax:011-23220994
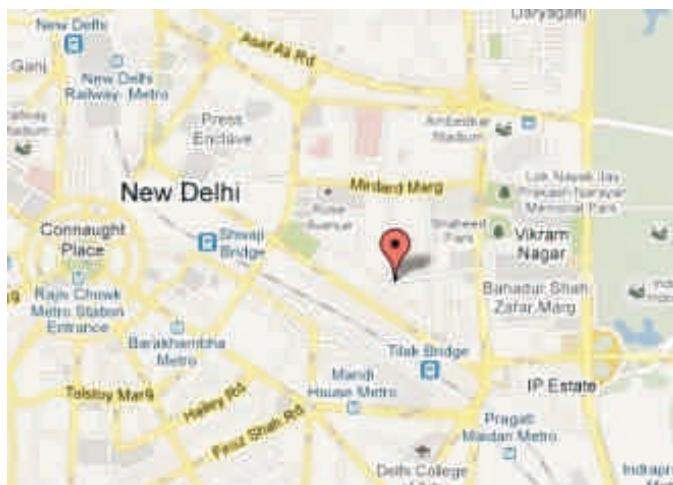
MAJOR REASONS FOR SHIFTING PFA TO FSSA

The provision under PFA has been amended nearly 360 times. While making amendments, standards formulation by Codex/advancements in food industries/ dietary habits/ nutritional status of general public/ social and cultural practices were taken into consideration. Various loopholes identified in this act and finally archaic Prevention of Food Adulteration Act (PFA), 1954 repealed and in 2006, new act with the name Food Safety and Standard Act materialized to ensure availability of safe and unadulterated food to all population. The major reasons for the shift are highlighted in table 3 (Raj etal., 2016).

Table 3: Major Reasons for Shifting PFA to Fssa

PFA	FSSA
It mainly focused on adulteration of food	Main focus is on consumers safety related to food
Opinion based	Scientific evidence based
It had perspective standards	Standards are more less general
Several authorities were there	Single authority system is there(FSSAI)
Based on inspection	Based on regular monitoring and surveillance
Provision of some punishment for all types of adulteration, even if hazardous to health	Grading of punishment according to type of adulteration
No standardization of food products	Mandatory standardization of food items
No provision of food recall	In order to remove unsafe food from the market and thus prevent injury to consumer's food recall producers can be initiate voluntarily by the manufacturers/distributors concerned or by the food authority.
No provision of improvement notice	If the designated officer has reasonable ground for believing that any food business operator has failed to comply with any regulations to which this section applies, he may, serve an improvement notice on that food business operator.

IMPORTANT CONFERENCES IN INDIA

International Conference on 'Best Practices in Food Safety Implementation' was organized by FSSAI on 9th-11th Nov. 2010 in Delhi in collaboration with Michigan State University, USA and TERI (www.sqfi.com). This conference represented a distinctive gathering of national and international experts of food industry from Food Safety Authority of Thailand, FDA of United States of America, Michigan State University of USA, National Institute of Nutrition- Hyderabad, Food Safety regulators from the States/ U.T.s in India, Consumer organizations, Industry, Academia, Research Institutions, Quality Council of India and apex Chamber of Commerce & Industry in India viz. CII / FICCI etc.

The important topics discussed in this conference were:

a.   Public-private partnership in capacity building & knowledge dissemination

b.   Need for FSSAI to develop a mechanism to regulate proprietary foods and dietary supplements

c.   Adoption of international best practices in food standards development

d.   Effective communication to consumers

e.   Need for a risk assessment

f.   Consumer friendly labeling

g.   Science based process for approving innovations, regulation of food advertisements

h.   Rationalization of labeling info and presentation there-of

i.   Sector-wise and industry level based approach in phased manner for traceability mechanism implementation

j.   Need for development of national reference documents by FSSAI on subjects related to food

k.   Need for adopting a phased approach to achieve international standards

INTERNATIONAL COOPERATION

- FSSAI regularly participated in the meeting of CODEX Alimentarious Commission and its Committees. Shri Sanjay Dave elected as a Chairperson, CODEX Alimentarious Commission (United States Food and Drug Administration, 2013).

- "Codex India" the National Codex Contact Point (NCCP) for India, is located at Food Safety and Standards Authority of India (Ministry of Health and Family Welfare), FDA Bhawan, Kotla Road, New Delhi, India, and coordinates/promotes Codex activities in India in association with the National Codex Committee and facilitates India's input to the work of Codex through an established consultation process.

- Shadow Committees are working on subject matters corresponding to the Codex Committees to assist the NCCP in the study and which are for consideration of technical matters.

- Delegation from foreign countries like Ethiopia, Bhutan, Maldives, Belgium and Bangladesh etc. made visit to FSSAI and have shown interest in developing permanent linkages about Food Safety related issues (United States Food and Drug Administration, 2009).

- EU delegates met FSSAI officials and issues related to rennet in Cheese. It has shown in interest in extending cooperation for capacity building and layer coordination in Food Safety Management System.

CAPACITY BUILDING

- Training Programme for the State/UT's Food Regulators (District Level Designated Officers) for 14 States and covered about 130 officials and also for States/UT's Food Safety Com-missioners.

- National workshop with IGNOU to discuss HR perspectives. Action in hand to develop competency based system.

- Syllabi for Food Handler, Analyst was finalized in consultation with Indian Institute of Public Health (IIPH), Hyderabad.

LIBRARY AND RESOURCE CENTRE

- FSSAI Library and Resource Centre (LRC) inaugurated on 19th July, 2011 "Total Library Software System" was made functional.
- FSSAI Library and Resource Centre hold institutional membership of American Centre Library, Delhi and British Council Library, Delhi and also a member of DELNET.
- Library is subscribing the Online Legal Database namely "Manupatra".

POLICIES IN PIPELINE

- Draft paper on surveillance of Food and Food borne Diseases.
- Laboratory Up-gradation policy
- Pilot project on Traceability and Recall.
- Framework for Food Safety Management System.
- Training Policy.
- Communication Strategy.
- National Surveillance Risk Assessment

LABORATORIES: GAP STUDY AND STANDARDS

A MOU signed between Quality Council of India (QCI), and FSSAI on 24th April, 2009 for conducting gap study of the Government public health/food laboratories. QCI has audited a total of 44 labs till August 2010. The gap study was conducted as per guidelines of ISO/IEC: 17025:2005 (General requirements for the competence of testing and calibration laboratories). It includes following areas:

a. General Chemicals

b. Pesticide Residue, antibiotic, heavy metals, veterinary drug residues etc

c. Microbiology

The imported food safety process includes the following steps:

1. Sampling request from Custom House Agents

2. Sampling of food item according to its hazard

3. Submission of sample to lab for testing

4. Receipt of lab report

5. Submission of No Objection Certificate (NOC) to customs for clearance of food import.

FSSAI explores the options of involving suitable agencies for assisting laboratories for up-gradation. A MOU is developed with the State Governments to identify and fix responsibility for suggestions and solutions along with various penalties for offending rules under the act which is shown in table 4.

EASTERN REGION

Food Safety and Standards Authority of India,
Ministry of Health and Family Welfare of India

4th Floor, Mayukh Bhawan, Salt Lake,
Kolkata- 700091
Telefax- 033-23585625
Tele Phone- 033-23580391
E-Mail: aokolkata@fssai.gov.in

NORTH EASTERN REGION

Food Safety and Standards Authority of India,
Ministry of Health and Family Welfare of India

6th Mile , Milan Path , Juripur, Panjabari Road
Guwahati-781037
Assam
Telefax - : 0361-2332446
E-Mail: deputydirectorner@gmail.com

WESTERN REGION

Food Safety and Standards Authority of India,
Ministry of Health and Family Welfare of India

902, Hallmark Business Plaza,
Opp. Gurunanak Hospital,
Bandra (E),
Mumbai-400051
Telefax- 022-22617672, 26420961, 27470708
E-Mail: aomumbai@fssai.gov.in

SOUTHERN REGION

Food Safety and Standards Authority
of India,
Ministry of Health and Family Welfare
of India

C-1-D, Rajaji Bhawan, Basant Nagar,
Chennai-600090
Telefax- 044-24463569
E-Mail: aochennai@fssai.gov.in

Food Safety and Standards Authority
of India
Ministry of Health and Family Welfare
of India,

First Floor, Marine Building
Malabar Road, North End,
Willigton Island,
Cochin-682009
Kerala
Telefax-0484-2666256
E-Mail: aocochin@fssai.gov.in

LABORATORIES (LIST OF LABORATORIES OF FSSAI, 2012)

Centre : Central Food Laboratory, Kolkata

3Kyd Street, Kolkata-700016
Tele: 033-22291309
Extension Raxaul
Central Food Laboratory
Raxaul, Lakshmipur(Near Champaran)
Bihar-845305

CFL, Mumbai

Central Food & Drugs Laboratory,
GMSD Compound, Belasis road,
Opposite Sahil Hotel, Mumbai Central
Mumbai-400 008

CONCLUSION

Ministry of health as well as Ministry of Food Processing should deal with safety of food and various acts related to it. The organized as well as unorganized food sectors are required to follow the same food law. FSSAI should have compulsory provision for contravene companies by black-listing the same or even suspension of their license. There is a considerable advantage of FSSAI in India but indubitably loopholes that needs to be identified accurately and filled properly.

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United States Food and Drug Administration, Nutritional Labeling and Education Act (NLEA) Requirements (8/94-2/95) (source: http://www.fda.gov/ ICECI/Inspections/ Inspection Guid es/ucm074948.htm accessed on 20th May 2013).

www.fssai.org.in

www.medindia.net/indian_health_act/acts.asp

www.mofpi.nic.in/EOI

www.sqfi.com

www.swaniti.in

GUIDELINES FOR THE AUTHORS

We invite unpublished novel, original, empirical and high quality research work pertaining to recent developments & practices in the area of management and information and emerging paradigms in allied subjects. The above mentioned tracks are only indicative, and not exhaustive.

INTRODUCTION: Manuscript must be in English prepared on a standard A4 size paper setting. It must be prepared on a single space and single column with 1" margin set for top, bottom, left and right. It should be typed in 12 point Calibri Font with page numbers at the bottom and centre of the every page.

MANUSCRIPT TITLE: The title of the paper should be in a 12 point Calibri Font. It should be bold typed, centered and fully capitalised.

AUTHOR NAME(S) & AFFILIATIONS: The author (s) full name, designation, affiliation (s), address, mobile/landline numbers, and email/alternate email address should be in 12-point Calibri Font. It must be centered underneath the title.

ABSTRACT: Abstract should be in fully italicized text, not exceeding 250 words. The abstract must be informative and explain background, aims, methods, results and conclusion.

KEYWORDS: Abstract must be followed by list of keywords, subject to the maximum of five. These should be arranged in alphabetic order separated by commas and full stops at the end.

HEADINGS: All the headings should be in a 10 point Calibri Font. These must be bold-faced, aligned left and fully capitalised. Leave a blank line before each heading.

SUB-HEADINGS: All the sub-headings should be in a 8 point Calibri Font. These must be bold-faced, aligned left and fully capitalised.

MAIN TEXT: The main text should be in a 8 point Calibri Font, single spaced and justified.

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Contributions to books

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David

- Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

Journal and other articles

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban

- Economics, Vol. 21, No. 1, pp. 83-104.

Conference papers

- Chandel K.S. (2009): "Ethics in Commerce Education." Paper presented at the Annual International Conference for the All India Management

- Association, New Delhi, India, 19-22 June.

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