PROBLEMS OF RURAL ENTREPRENEURS: A CASE STUDY OF DISTRICT JALANDHAR

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ABSTRACT

The present study is an effort to examine the problems of rural entrepreneurs in Jalandhar. The results of the study found that 'inadequate finance', 'inadequate marketing', 'restricted mobility', 'lack of managerial skills', 'technical experience', 'lack of modernization', 'work-family imbalance, 'lack of awareness', 'lack of skilled manpower', 'inadequate supply of power', 'insufficient supply of inputs', 'cut throat competition', 'inflation' and 'reducing subsidies' are the fourteen problems that have an adverse impact over the growth of rural entrepreneurship in Jalandhar. The significant value of Kendall Coefficient of Concordance signifies that there is a close concordance among the perceptions of the respondents pertaining to the statements designed for the study. The findings of the present study will be useful for the various stakeholders' viz., centre and state governments especially dealing with the micro and small scale industry, non-governmental organizations etc. to formulate effective policy for the promotion of rural entrepreneurship in our economy.

INTRODUCTION

The economies across the globe believe that active participation of the rural entrepreneurs in the economy and society contributes directly to the growth and prosperity of the nation. Apart from depending exclusively on agriculture, rural people are also showing the courage to run the entrepreneurship. They are ardently undertaking the entrepreneurial risks and by doing this are not only creating employment opportunities for themselves but also for others in rural areas.The statistical sources of India also depict that the status of rural entrepreneurship is important in our economy. The All India Report of (2016) of the Government of India, based on the results of 'Sixth Economic Census' in India shows that the rural entrepreneurship is contributing considerably to the economic development of our economy. The report submits that out of the total 584.95 lakh establishments, 347.96 lakh belongs to the rural establishments which accounts for 59.49 per cent out of the total establishments. It is further noted that most of the rural establishments/enterprises are the unregistered enterprises. The analogous report further submits that more than ninety percent rural enterprises are unregistered in India which points out that it is hard for the regulating authorities to approach unregistered rural enterprises to access their problems and to take corrective measures for them.

Earlier Studies

As far review of literature is concerned so far various studies have been examined over the different periods of time in abroad or India for exploring the various problems of the rural entrepreneurs of different levels, scales or types of entrepreneurships. The work of Carter (1980), Hisrich and Brush (1984), Symons (1987), Hisrich and Fan (1991), Malagawakar (1997), Rajendran (1999), Subrahmanyabala (2004), Westhead, *et al.* (2004), Alonso (2009), Khanka (1990),

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Khanka (1995), Shetty (2008), Khanka (2010), Jha and Agrawal (2010), Mishra and Puri (2010), Saleem (2010), Saxena, (2012), Datt and Sundharam (2012), Dhar (2013) etc. is noticeable for exploring the problems in the way of rural entrepreneurs. The studies of the different period of time identified several barriers in the form of 'finance', 'marketing', 'mobility', 'managerial and technical skills', 'modernization', 'work-family imbalance', 'awareness', 'manpower', 'supply of power', 'supply of inputs', 'cut throat competition', 'inflation' and 'reducing subsidies' for the growth of rural entrepreneurship. With this objective, to examine the problems of rural people to be entrepreneurs the present study has been categorized into three sections. Section I deals with the research methodology of the study. Section II discusses the problems of the rural entrepreneurs. Conclusion and recommendations are presented in Section III.

Objective of the Study: The present study is an attempt to examine the problems of rural entrepreneurship in Jalandhar.

Section I: Research Methodology
The present study is mainly based on primary data. The rural entrepreneurs who have more than two years' experience of entrepreneurship at micro scale level comprised the populace of the study. A sample of 200 respondents was selected and using the convenience sampling interviewed in Jalandhar, Punjab personally from January, 2015 to May, 2016. The demographic profile of the respondents is presented in exhibit 1.

Exhibit 1
Demographic Profile of Sampled Respondents (N = 200)

Demographic Characteristics		Number of Respondents	Percentage
Gender:	Male	192	96.0
	Female	08	4.0
Age (in Years)	Less than 30	34	17.0
	More than 30	166	83.0
Qualification	Matriculation	160	80.0
	Senior Secondary	22	11.0
	Graduation	18	9.0
Nature of Entrepreneurship	Service	116	58.0
	Manufacturing	84	42.0
Experience (in Years)	Less than 10	44	22.0
	More than 10	156	78.0

The above table shows that 96.0 percent respondents were male and 4.0 percent were female. 17.0 percent of the respondents belonged to the age group of 'less than 30 years' and 83.0 percent belonged to the age group of 'more than 30 years' sampled in the study. 80.0 percent of the respondents were matriculate, 11.0 percent were senior secondary and 18.0 percent were graduates. 58.0 percent of the respondents were running the service sector and 42.0 percent were in manufacturing sector in the study. 78.0 percent have the experience of more than 10 years and 22.0 percent have the experience of less than 10 year experience of rural entrepreneurship.

With the help of a well-structured questionnaire the problems of the small scale entrepreneurs were assessed through fourteen statements. The respondents

were requested to express their level of agreement/disagreement on a five point scale ranging from strongly agreed to strongly disagreed. Suitable weights were assigned ranging from strongly agreed (5) to strongly disagreed (1) to analyze the collected information. The reliability of the scales used was also computed by using the Cronbach Alpha that was .874 for the present scale, which was more than the acceptable level (Cronbach, 1951; Hair *et al.*, 2003). For secondary data, the website of Ministry of Micro, Small and Medium Enterprises of India and Ministry of Statistics and Programme Implementation of India was visited for extracting the data for rural entrepreneurship. For the computation/statistical analysis the SPSS version 11.0 for windows has been used in the present study.

Section II: Problems of Rural Entrepreneurs in Jalandhar

This section examines the problems of the small scale entrepreneurs in Jalandhar. The descriptive statistics of fourteen statements along with their respective weighted average score and standard deviation are shown in exhibit 2.

Exhibit 2
Descriptive Statistics of Statements (N=200)

Label	Barriers (in abridged form)	WAS	S.D.
p_1	inadequate finance	4.52	0.79
p_2	inappropriate marketing	4.47	0.82
p_3	restricted mobility	4.42	0.77
p_4	lack of managerial skills	4.36	0.81
p_5	lack of technical experience	4.35	0.83
p_6	lack of modernization	4.33	0.78
p_7	work-family imbalance	4.31	0.92
p_8	lack of awareness	4.29	0.87
p_9	lack of skilled manpower	4.27	0.86
p_{10}	inadequate supply of power	4.24	0.82
p_{11}	insufficient supply of inputs	4.19	0.82
p_{12}	cut throat competition	4.15	0.85
p_{13}	Inflation	4.12	0.87
p_{14}	reducing subsidies	4.09	0.86
Overall Weighted Average Score $(p_1\text{-}p_{14})$		**4.29**	**0.83**

WAS=Weighted Average Score and S.D.=Standard Deviation.

Table 2 exhibits that respondents have been found agreeing that 'inadequate finance' (weighted average score 4.52), 'inappropriate marketing' (4.42), 'restricted mobility' (4.47), 'lack of managerial skills' (4.36), 'lack of technical experience' (4.35), 'lack of modernization' (4.33), 'work-family imbalance' (4.31), 'lack of awareness' (4.29), 'lack of skilled manpower' (4.27), 'inadequate supply of power' (4.24), 'insufficient supply of inputs' (4.19), 'cut throat competition' (4.15), 'declining value of money/inflation' (4.12) and 'reducing subsidies' (4.09) are the barriers of rural entrepreneurship in Jalandhar. The identified problems are closely inter-related with each other. The nature of one problem may be the cause of other problem and so on.

On the basis of the studies results in the ongoing study it has been found that

problem of inadequate finance is one of the significant problems in the way of rural entrepreneurs. The limited financial strength of the rural entrepreneurs deprives them to avail the various opportunities of the business. The poor access of the rural entrepreneurs deprives the rural entrepreneurs to procure the finance at high cost of capital and at rigid terms which finally increases the cost of production of the business. It is also important to note that the problem of finance adversely affects so many other issues of the rural entrepreneurs. It makes it difficult for the rural entrepreneurs to obtain the services of the managerial and technical experts, acquire sophisticated technology, sufficient supply of inputs, and procurement of skilled manpower for their entrepreneurships.

Similarly, the results of the ongoing study further identify that to keep an appropriate equation between work and family is hard for the rural entrepreneurs. The studies explore that generally rural entrepreneurs have large size of families that keeps them to be concerned with their families first and later on with their entrepreneurships. The decisions of the rural entrepreneurs are subject to the circumstances of their families. The familial priorities inhibit them to provide adequate time and efforts to their units. This delimits the mobility of the rural entrepreneurs which further confines the awareness level of the rural entrepreneurs. They bound to rely upon and use the local sources for their entrepreneurship.

Due to lack of awareness rural entrepreneurs have to take the help of intermediaries' viz., dealers, agents, brokers etc. for knowing the status of the markets of the distant places and trust on their feedback. It might be possible that in many cases such sources would not be able to decency the trust of such rural entrepreneurs. Likewise, the problem of inflation/declining the value of money and reducing subsidies too affects the rural entrepreneurship adversely. This increases the cost per unit of the goods/services of the business which later on fails to handle the cut throat competition of the market.

Similarly an attempt has also been made to examine the concordance among the respondents for perceiving the statements designed for examining the barriers of the rural entrepreneurship in Jalandhar. For this purpose, Kendall's Coefficient of Concordance has been applied in the ongoing study. The value of Kendall's (W) is found to be .117 [where ($n = 200$); ($\chi^2 = 34.279$) and ($df = 13$)] which is asymptotically significant at 5 percent level of significant.

Variables	W	N	χ^2
$p_1 - p_{14}$	.117	200	34.279*

*The value of p is 0.000032 and is significant at 5 percent level of significance (df=13).

The perusal of table 3 exhibits that significant value of Kendall Coefficient of Concordance signifies that there is a close concordance among the perceptions of the respondents pertaining to the statements designed for exploring the problems of the rural entrepreneurship in Jalandhar.

Section III: Conclusion and Recommendations

The term rural entrepreneurship is vital for accelerating the wave of industrialization for an economy. India comprises of more than seventy per cent of rural population and needs a sound structure of rural entrepreneurship for improving the basic socio-economic indicators of the economy. The economic plans, policies and programmes of the different periods of time have given a significant role to the rural entrepreneurs for improving the socio-economic conditions of rural population in the economy. But unfortunately, despite of all such efforts, still majority of the rural population is deprived of the basic amenities of life. The adverse features viz., poverty, starvation, illiteracy, dependence on agriculture, seasonal occupations and many more are the part of our rural economy even after more than six decades of independence and calls forth to conduct a detailed study for examining the problems/factors accountable in this regard.

So far various studies have been examined over the different periods of time in abroad and in India for exploring the various dimensions of the factors/problems inhibiting rural entrepreneurs. On the basis of the results of the ongoing study it has been found that 'inadequate finance', 'inadequate marketing', 'restricted mobility', 'lack of managerial skills', 'technical experience', 'lack of modernization', 'work-family imbalance, 'lack of awareness', 'lack of skilled manpower', 'inadequate supply of power', 'insufficient supply of inputs', 'cut throat competition', 'inflation' and 'reducing subsidies' are the fourteen problems that have an adverse impact over the rural entrepreneurs. The significant value of Kendall Coefficient of Concordance signifies that there is a close concordance among the perceptions of the respondents pertaining to the dimensions/statements designed for the study.

The regulating agencies have to direct to the financial agencies to provide loans to rural entrepreneurs at liberal terms. Such agencies too need to play an active role in the financial issues of rural entrepreneurs because the problem of finance adversely affects so many other issues of the rural entrepreneurs. Similarly, the Ministry of Micro, Small and Medium Scale Industry and Ministry of Rural Development with the help of District Industrial Cells need to establish more agencies like Rural Development Self Employment Training Institutes; Rural Industries Service Centres; Mahatma Gandhi Institute for Rural Industrialization, Wardha; Central Bee Research and Training Institute, Pune; Dr. Ambedkar Institute of Rural Technology and Management, Nashik; Kumarappa National Handmade Paper Institute, Sanganer and Jaipur; Central Village Pottery Institute, Khanapur, Karnataka and Khadi Gramodyog Prayog Samiti, Ahmedabad etc. for identifying and removing the problems of rural entrepreneurs of our economy. Such agencies/institutes with the help of District Industrial Cells of each district are required to help for guiding and upgrading the rural population for exploring and exploiting the entrepreneurial opportunities. Last but not the least the frequent entrepreneurial development training programmes or workshops should also be conducted in rural areas for the growth of rural entrepreneurships. The findings of the present study will be beneficial for the various stakeholders viz., centre and state

governments especially dealing with the micro and small scale industry, non-governmental organizations, society, local community, etc. to formulate effective policies that can motivate rural people to become entrepreneurs and to remove the problems in the way of their entrepreneurship.

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The art of Ambush Marketing : Indian Perspective

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ABSTRACT

Ambush marketing, a term first coined by marketing guru Jerry Welsh, has not really been rigorously defined. However, it broadly refers to a situation in which a company or product seeks to ride on the publicity value of a major event without having contributed to the financing of the event through sponsorship. It is typically targeted at major sporting events - like the Olympic Games or the world cups in various games - and is a strategy adopted by rivals of the official sponsors. Ambush Marketing is a marketing technique which involves riding on the coattails of a major event or campaign without actually paying for or participating in the sponsorship or event .It is a tactic that many vendors use to get free promotion and compete with those vendors actually paying for the sponsorships and/or event without having to dish out the big bucks themselves. Ambush marketing, a term first coined by marketing guru Jerry Welsh. The word ambush comes from French verb "embuschier" which means "to place in a wood". However, it broadly refers to a situation in which a company or product seeks to ride on the publicity value of a major event without having contributed to the financing of the event through sponsorship. It is typically targeted at major sporting events - like the Olympic Games or the world cups in various games - and is a strategy adopted by rivals of the official sponsors. The objectives of ambush marketing are two. First, to get maximum returns on the marketing buck. Official sponsorship costs are forbiddingly high, even for deep-pocketed marketers, and simply unaffordable for others. The first instance where ambush marketing is believed to have first occurred is at Los Angeles Olympics in 1984 where Fuji was the official sponsor of the games but Kodak sponsored the ABC broadcasting of the event and the official film of the US track team, thus ambushing Fuji .The second and more common reason: to undermine the branding efforts of rivals by stealing the attention, increasing the clutter and confusing the viewers. The Pepsi hot air balloon flying above Sharjah, on the day of the Coca-Cola Cup final, is one such example. More recently, there is, for instance, the straight fight between Hero Honda, a global sponsor of the Champions Trophy which took place in Sri Lanka, and its rival TVS. TVS has, according to industry experts, paid Rs 12 crore to rope in cricketer Sachin Tendulkar as its brand ambassador for three years.

Keywords : Ambush, Marketing, Olympics, Nike, Sponsorship

INTRODUCTION

Ambush marketing is clearly another tool in a brand's arsenal and is a part of competitive marketing aimed at building awareness and creating a differentiation in a competitive market place.In its more crude forms, ambush marketing could involve unauthorized use of logos or designs associated with the event. More often, however, ambush marketing involves more subtle forms of confusing or misleading the public about who are actually sponsoring the event.

Prime Examples of Ambush Marketing

EXAMPLE #1: Olympic Games

we saw in the 2014 Winter Olympics, it is a great example of Ambush Marketing to start with. In 1996, Nike rolled out one of the most memorable Ambush Marketing Campaigns in history.

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1996 Atlanta Games

During the 1996 Olympic Games held in Atlanta, Nike chose not to actually invest in the games themselves or any sponsorships and instead chose to try their hands at Ambush Marketing. Nike not only lined the streets of the city of Atlanta with Olympic themed advertisements, they also created one of the most memorable moments at the 1996 Olympics: Michael Johnson with the gold Nike Shoes he raced in and his gold medals. No one even remembered that Reebok actually sponsored the games, just Nike, those shoes and all the advertisements surrounding the games.

1992 USA Basketball

In 1992 Nike sponsored Michael Jordan and the USA basketball team. During the Awards Ceremony Michael Jordan covered up the Adidas logo on his uniform with the American Flag he was holding. After the Awards Ceremony a lot of people were upset, saying he did it purposely because NIKE was sponsoring him.

EXAMPLE #2: RONA Home Improvement Chain

I This example of Ambush Marketing is very unique and innovative. RONA placed their ad under an Apple iPod advertisement in an available ad space. It is not your typical type of Ambush Marketing because it is not done to grab a bigger percent of the market from a direct competitor. It said "Nous récupérons les restes de peinture" translating into, "we recycle leftover paint." (www.businessinsider.com) This example was not global like Apple, but it surely got attention with its single occurrence.

EXAMPLE #3: 2006 FIFA World Cup

Again Nike is the star of this example. In the 2006 World Cup, Nike once again created a successful Ambush Marketing campaign. They launched a social networking website for the world's soccer fans as part of it's "Joga Bonito" (a beautiful game) marketing campaign. Nike claimed that their website and sponsorship of the Brazilian soccer team combined gave them the same exposure as their competitors Adidas, only they didn't pay the extra millions that Adidas had to for the Cup Sponsorship.

Indian Examples of Ambushing

1) SNAPDEAL AMBUSHES FLIPKART'S BILLION DAY THUNDER; AS AMAZON IS LEFT AMAZED

It's not new for ecommerce players in India to troll each other; in fact all the three market leaders Amazon, Snapdeal and Flipkart have openly challenged each other with their creative campaigns; remember #AchchaKiya, #AchchaKiyaBataDiya & #YahanDekhlo hashtags .

But in October 2015, competition among the rivals moved to another level, when the brand war moved to print during the Diwali festival season sale where all the brand biggies were not only present on the front page of leading dailies in India, but were also creatively trolling each other with witty content.Amazon announced "The Great Indian Festive Sale" on Hindustan Times, Mint, Times of India and Navbharat Times; Flipkart promoted its sale 'Big Billion Days' by taking over the front and back pages of The Times of India, Hindustan Times and Dainik Bhaskar. **'Abhi Nahin toh Kabhi Nahin'** is what Flipkart reminded its consumers. But the one that stole the show was Snapdeal with its creativity and wit as they released a clever ad campaign by taking a dig at both its rivals – Flipkart and Amazon. The full-page ad appeared in The Times of India's third page, which read **' You don't need a BILLION offers to *amaze* you. You just need to *snap* the best ones. For the best offers this Diwali, shop only on Snapdeal'.**

We can't comment on which brand got the maximum sales but Snapdeal definitely won the Ad war over Flipkart and Amazon.

Snapping back!

BMW

130 YEARS OLD MERCEDES WISHES BMW ON ITS 100TH ANNIVERSARY

BMW celebrated its 100th anniversary in 2016 with a big bash . BMW's arch rival felt they should gate crash the centennial party.

The pre- started trolling BMW with not-so-congratulating cheeky ads in newspapers using an image of the iconic BMW kidney grilles with the text that reads:

"Thanks for 100 years of competition. The previous 30 years were somewhat dull."

Mercedes also extended its greetings to BMW with a 10 second video on Instagram.

If this was not all, Mercedes thought of throwing a party for BMW at the Mercedes-Benz Museum with an invitation from March 8th to 13th 2016, where BMW employees got to enjoy free admission to the museum to "discover the complete history of the automobile." Those arriving in a BMW were given free parking at a prominent position right outside the entrance to the museum.

3) Kingfisher, Jet Airways, Go Air

One of the best examples in ambush marketing still remains the Go Air - Kingfisher-Jet Airways example. Jet Airways put out an outdoor hoarding saying, "We've changed." Kingfisher was quick to respond with, "We made them change." Go Air said, "We've not changed. We are still the smartest way to fly."

4) Times of India And Hindustan times

It's been an open war between the two major publishing houses in India—Bennett Coleman & Co Ltd (BCCL) which publishes The Times of India and The Economic Times and HT Media which publishes the Hindustan Times and Hindustan among others. The Times of India has recently gone on to release a video called "The TOI challenge" trashing rival Hindustan Times's reach in Delhi. To

which, Hindustan Times has responded with an animated video if its own called "The curious case of the eternal crybaby". The bone of contention is the readership figures released by a revamped Indian Readership Survey (IRS) which shows falling share for most publications. Hindustan Times however has shown increased readership as per the survey. The two have engaged in verbal duels at various points. For instance, an ad onSeptember 13 in The Times of India said, "The truth shall prevail. Especially at 6 am". The ad further read, "You may have read some claims and counter claims about readership and circulation of English dailies in Delhi and NCR. But the truth simply is: for the 'regular' copies of the TOI and HT (i.e., fully loaded copies that carry supplements and are listed in ABC as single or combo) TOI is 38% ahead of HT." The ad further invited readers to get a firsthand experience of the newspaper's leadership by taking up The Times of India challenge, by contacting TOI and visiting a newspaper depot. The Economic Times also took on HT numbers with a headline which read, "All Down & Out, HT Up and About, Media industry foxed." Similarly, HT published an editorial piece in the main edition saying "TOI cannot digest readers' message, shoots messenger".

ESSENTIALS OF AMBUSH MARKETING

Catch your competitors unaware: ambush marketing can be successful for the ambushers if it is a surprise attack. i.e. the competitors are unaware of the intentions of the ambushers. Rope in players: as mentioned earlier ambushing in most of the cases is associated with sports events. Some players are considered as Gods by their fans. When such players are sponsored by a brand, its value automatically increases. Capture media time: due to some reason if the companies are unable to gain sponsorship rights, they can capture the media time around the event so that they can increase the frequency of their adverts. Don't play against the law play with it: till date no specific law exists to regulate ambush marketing. Many claims made by the sponsoring companies have been rejected by the courts since they did not violate any of the laws regarding infringement or copyrights.This shows that successful ambushers have been quite careful in playing with the law and benefited from this marketing technique rather than playing against it and taking risks.

AMBUSH MARKETING STRATEGIES: Five commonly employed ambush marketing strategies as identified by Meenaghan (1996 p106) are: 1. Sponsoring media coverage of an event Getting sponsorship rights for an event itself does not

include associated broadcasting rights. This leads to a scenario where the rivals of the official sponsors often obtain the broadcasting rights and take away the limelight from them in spite of their official status. 2. Sponsoring a sub category within an event This can be understood through the Kodak and Fuji strategies in 1988 OlympicGames. Kodak secured the worldwide category sponsorship for the games, while Fuji obtained sub-sponsorship of the U.S. swimming team, which it promoted aggressively. 3. Making a sponsorship-related contribution to a players' pool. The rivals of the official sponsors can also sponsor teams or individuals competing within specific events. 4. Engaging in advertising that coincides with a sponsored event .Other than entering into contracts within the event or with teams and individuals, the ambushers can also buy normal advertising time and space that are screened during the interval periods. 5. Development of other imaginative ambush strategies Ex: non-sponsors handing out coupons and caps to spectators, running good luck and congratulations ads, using world cup tickets in consumer sweepstakes etc.

PROS AND CONS OF AMBUSH MARKETING
PROS:
1.   For the company running the Ambush Marketing campaign, it is a much cheaper option to get our brand noticed and in some cases with the same amount of impact if not more.
2.   Ambush Marketing is a great way to jump-start our business in the beginning because most start-ups don't have the financial capability to sponsor something as large as the Olympics or Super Bowl.
3.   Ambush Marketing creates more competition among companies jockeying for market share which is good for consumers; more competition usually means lower prices.
4.   Ambush advertising helps both brands — leader and challenger — gain instant salience. It raises interest in the category and gets more people talking.
5.   It makes ordinary content more exciting. In isolation, you wonder what's so 'talk-worthy' about the individual pieces of work.
6.   The truth is: with ambush advertising, nobody loses. Everybody wins. Both the brands and their companies get lots of free media.
7.   The advertising agencies win because the client increases spends —more then was planned — and so more revenue!
8.   Lots of people in the advertising and marketing companies find sudden purpose. This releases energy and creates renewed enthusiasm. The CEOs of both companies spend more time with the concerned brands' heads who therefore get greater OTS (opportunity to see) and visibility.
9.   The news and trade media, always looking for content, have something to write about. This is like fresh juice. They can now fill lots of columns.

10. Media owners are happy because of the sudden increase in media spends.

CONS:
1. Successful Ambush Marketing diminishes the value of the actual sponsorships and brands who invest.
2. Some say that Ambush Marketing is a sneaky and less honest way to market and therefore, in a smaller, more local approach, it may not be a good solution. A smaller local business may not be able to handle the negative media and brand impact surrounding it.
3. The word "Ambush" itself carries a negative connotation with it.
4. The actual sponsors of events get certain advantages and privileges that the "Ambush" company will never have.

Back to Basics – Final Thoughts

At first glance, Ambush Marketing seems like a smart and innovative use of marketing dollars. It is a great way to go back to basics and capitalize on others who have deep pockets and can pay big bucks for marketing and advertising sponsorships. This type of marketing also comes with risks such as the negative connotation that goes along with it. In fact some feel that Ambush Marketing is unethical and very sneaky .Ambush marketing tends to bring out the best of creativity. It also helps to break the clutter of conventional advertising. Meanwhile, it appears that in any given situation it would be almost impossible to completely stop ambush marketing as it would amount to controlling the free flow of ideas."

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Research Paper On Impact Of Macroeconomic Variables On Mutual Funds In India

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ABSTRACT

Any investment decision necessitates the prior evaluation of risk and reward attributes associated with investing in a particular security or portfolio of securities. With the plethora of schemes to choose from and increasing awareness amongst the general public, mutual funds have been emerging as a desired investment option in comparison to other investment avenues. However, before making an investment decision, the investor has to examine the various macroeconomic factors. There are numerous variables at the economy, industry and the company level which have an influence on the investment choices of the investors. In this context, the present study attempts to ascertain the macroeconomic factors which have an impact on the mutual funds market. The association between the Mutual funds market and the macroeconomic variables has been analysed using Regression model. Further, the Existence of causal relationship has been analysed using the Granger Causality test. It is apparent from the study that the Real macroeconomic variables considered for the analysis do not have a significant influence on the Mutual funds market and were not found to be reliable to even predict the market movements.

Keywords: Macroeconomic, Regression, Granger Causality, Causal relationship etc.

INTRODUCTION

Mutual fund is an investment vehicle which is set up in the form of trust that pools the funds and invests the funds of investors in the portfolio of financial instruments such as equity, debentures, money market instruments. The SEBI defines mutual fund as "A fund established in the form of a trust to raise money through the sale of units to the public or a section of the public under one or more schemes for investing in securities, including money market instruments or gold or gold related instruments or real estate assets". The securities so sold are known as Units and the investors to whom those units are sold are known as Unit holders. The units are sold to the investors in the fraction of funds invested by them. The fund manager is responsible for managing the mutual fund and the management of funds is done by undertaking necessary research and by using his investment management skills. The earnings earned from the units in the form of capital appreciation and other incomes are distributed on to the unit holders in the proportion of number of units owned by them. However, mutual fund schemes are always subject to market risk and the fund managers are required to design the portfolio of schemes in accordance with the investment objective of mutual fund schemes

REVIEW OF LITERATURE

Jain (2005) attempted to examine the investment performance of mutual fund schemes in terms of risk and return and also made their comparison with the benchmark indices. The results exhibited that most of the schemes underperformed the benchmark indices upto the year 1997-98 (except 1994-95) but post that period most of them outperformed the CNX nifty and BSE Sensex Index as per the Sharpe

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and Treynor measures. **Ande (2008)** endeavored to determine the variables having an impact on the performance of open ended equity schemes in India. The study was undertaken for the period July 2004 to June2007 for which the primary data was used. Data analysis was done using 6 points rating scale in which rating scale of 1 represented the least important factor and 6 represented the most important factor affecting the performance of mutual fund schemes. The analysis identified Risk management, stock selection and timing, Existing returns of the scheme and excess returns over the benchmark as the significant factors that effected the performance of open ended equity schemes. **Rao and Daita (2012)** analysed the. factors effecting the investments in Mutual funds using Economy, Industry and Company Approach by taking Reliance Capital asset Management Limited (RCAML) into consideration. Correlation test, ADF Unit root test and Granger Causality test were used for the purpose analysis. The study revealed that the whole mutual fund industry is dominated by a few companies and also found that the macroeconomic variables do not play a significant role in influencing the mutual funds market. **Kumar (2013)** attempted to analyse the perception of investors about the Indian mutual funds. The researcher used Kenall's coefficient of concordance and chi- square test and for the purpose of analysis. The analysis revealed that the Mutual funds have better expertise than the individual investor (AWS=4.54) and that they are useful for small investors. The study further concluded that Mutual funds offer higher returns than the other forms of investments (AWS=4.02).

OBJECTIVES OF THE STUDY

1. To analyse the relationship between macroeconomic variables and mutual fund market.
2. To examine the presence of cause and effect relationship between mutual fund market and macroeconomic variables.

HYPOTHESIS OF THE STUDY

The objective of the study can be achieved using the following hypothesis:

H_o1: Consumer price Index does not influence the mutual fund market.
H_a1: Consumer price Index influences the mutual fund market.
H_o2: Gross Domestic Savings does not influence the mutual fund market.
H_a2: Gross Domestic Savings influences the mutual fund market.
H_o3: Exchange rate does not influence the mutual fund market.
H_a3: Exchange rate influences the mutual fund market.
H_o4: Growth rate does not influence the mutual fund market.
H_a4: Growth rate influences the mutual fund market.
H_o5: Interest rate does not influence the mutual fund market.
H_a5: Interest rate influences the mutual fund market.
H_o6: Nifty returns Index do not influence the mutual fund market.
H_a6: Nifty returns Index influences the mutual fund market.

RESEARCH METHODOLOGY

The present study is based on the Annual data for a period of 15 years from April 2000 to March 2015. Stock prices are represented by daily closing of CNX Nifty Index. Closing values of CNX Nifty Index have been obtained from the official website of SEBI. The data on Mutual Funds flow has been taken from the website of moneycontrol.com. The data regarding all the variables that is, Exchange rate, Consumer price Index, Gross Domestic Savings, interest rate, growth rate, have been obtained from Handbook of statistics on Indian Economy, Economic survey (various issues) and the website of RBI. The data on Mutual Funds flow has been taken from the website of moneycontrol.com. Closing values of CNX Nifty Index have been obtained from the official website of SEBI.

STATISTICAL AND ECONOMETRIC TOOLS

Analysis of the association and cause and effect relationship has been done using the econometric tools such as ADF unit root test, Regression Analysis and Pairwise granger causality test. For the purpose of analysis, Microsoft excel, SPSS and Eviews have been used.

ANALYSIS AND RESULTS

Augmented Dickey-Fuller Unit-root Test statistic

The ADF unit-root test has been used to check the stationarity of time series data and the present study has employed Hanan-Quinn information criterion test (at 5% level of significance) for choice of the lag-length. Initially the data was non stationary in nature. Hence, the first differences of all the variables has been done so as to make the data stationary. Table 1 shows that after the transformation, the variables are stationary in nature.

Table- 1
Unit-Root Test

H_0: Variable is having unit root.	
Variables	**ADF Statistics with Intercept**
Mutual Fund Investments	5.597798
Exchange rate	3.331076
Gross Domestic Savings	3.189475
Growth rate	3.194714
Interest rate	3.316625
Consumer Price Index	8.862921
CNX Nifty returns	5.655833
Critical Values	
5 per cent	3.175352

The results of ADF unit root test have been reported in the Table 1. The Results of the analysis indicates that all the variables are stationary at level.

REGRESSION MODEL FOR MUTUAL FUND INVESTMENTS

Regression analysis is the study of the dependence of one dependent variable on one or more other variables (Independent variables) There are certain essential assumptions underlying any Regression equation. The presence of Heteroscedasticity has been examined using Breusch-Pagan-Godfrey Test. The hypothesis under this test of Heteroscedasticity are as:

Ho: There is no Heteroscedasticity between the variables.
Ha: There exists Heteroscedasticity between the variables.

Table- 2
Breusch-Pagan-Godfrey Test.

| Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.096210	Prob. F(6,6)	0.9941
Obs*R-squared	1.140959	Prob. Chi-Square(6)	0.9797
Scaled explained ss	0.137700	Prob. Chi-Square(6)	0.9999

The presence of Heteroscedasticity has been examined at 5% level of significance. The null hypothesis will be accepted if the test statistics is greater than 0.05. The table results show that the Breusch-Pagan-Godfrey Test statistics of all the variables is found to be greater than 0.05. So, the null hypothesis of no Heteroscedasticity between the variables has been accepted at 5% level of significance.

Normality of the residuals has been examined using Jarque- Bera statistics. The hypotheses for Jarque- Bera statistics are as:

Ho: Residuals are normally distributed.
Ha: Residuals are not normally distributed.

Table- 3
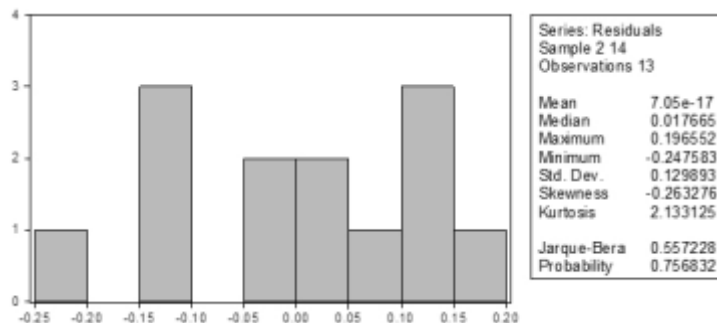
Descriptive statistics reveal that the variables are normally distributed as indicated by the value of Jarque bera statistics. The 'p' value is greater than 0.05, so the null hypothesis of normality of data will be accepted.

Multicolinearity between the variables has been examined using the Group Correlations between the variables.

Table- 4
GROUP CORRELATIONS

	CPI	ER	GDS	GR	IR	ISMR_NIFTY
Consumer Price Index	1.000000	-0.067637	-0.511616	-0.128300	0.296598	-0.188510
Exchange Rate	-0.067637	1.000000	-0.083664	-0.083554	0.437327	-0.383500
Gross Domestic Savings	-0.511616	-0.083664	1.000000	0.438703	-0.073536	-0.306609
Growth Rate	-0.128300	-0.083554	0.438703	1.000000	-0.189285	-0.365899
Interest Rate	0.296598	0.437327	-0.073536	-0.189285	1.000000	-0.246236
NIFTY returns	-0.188510	-0.383500	-0.306609	-0.365899	-0.246236	1.000000

Table 2 shows that the coefficient of correlation between various independent variables is less than 0.60 in case of all the variables. So the model is from multicollinearity.

The presence of autocorrelation has been examined using Breusch-Godfrey Serial Correlation LM Test. The hypothesis under this test of autocorrelation are as:
Ho: There is no autocorrelation between the variables.
Ha: There exists autocorrelation between the variables.

Table- 5

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.341407	Prob. F(2,4)	0.7296
Obs*R-squared	1.895565	Prob. Chi-Square(2)	0.3876

The presence of autocorrelation has been examined at 5% level of significance. The null hypothesis will be accepted if the test statistics is greater than 0.05. The analysis reveals that the
Breusch-Godfrey Serial Correlation LM Test statistics of all the variables is found to be greater than 0.05. So, the null hypothesis of no Autocorrelation between the

variables has been accepted at 5% level of significance.

REGRESSION MODEL FOR MUTUAL FUND INVESTMENTS

Multiple regression model has been employed to study the Mutual Funds investments with respect to various macroeconomic variables. A multiple regression equation takes the following form:

Mutual Funds investments
$$= a + \beta_1 ER + + b_2 GR + b_3 IR + b_4 Nifty + b_5 CPI + + b_6 GDS\#..............b_n X_n + e$$
Where, a = constant term
ER = Exchange Rate
GR = Growth Rate
IR = Interest Rate
Nifty = Returns of CNX Nifty
CPI = Consumer Price Index
GDS = Gross Domestic Savings

The regression equation fitted for the model includes Mutual Funds investments as dependent variable and all the remaining variables as Independent variables. Ordinary Least Square equation has been employed for the study. The model equation has been developed for Annual data from April 2000 to March 2015.

Table-6
Multiple Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.219798	0.292277	-0.752019	0.4805
Consumer Price Index	0.024538	0.032211	0.761774	0.4751
Exchange Rate	0.015674	0.008835	1.774161	0.1264
Gross Domestic Savings	0.022279	0.010121	2.201264	0.0058
Growth Rate	0.024162	0.027109	0.891291	0.4071
Interest Rate	-0.298114	0.341275	-0.873532	0.4160
NIFTY returns	0.002217	0.000123	18.02304	0.0383
R-squared	0.404928	Mean dependent var		0.020048
Adjusted R-squared	-0.190144	S.D. dependent var		0.168383
S.E. of regression	0.183696	Akaike info criterion		-0.247338
Sum squared resid	0.202465	Schwarz criterion		0.056865
Log likelihood	8.607700	Hannan-Quinn criter.		-0.309866
F-statistic	0.680468	Durbin-Watson stat		2.231884
Prob(F-statistic)	0.004010			

The regression equation for the above model is as:
Mutual Fund investments $= a + 0.024538$ CPI $+ 0.015674$ER $+ 0.022279$GDS $+0.024162$GR$- 0.298114$IR $+0.002217$Nifty

The table shows that the prob. Statistics or the 'p' value is 0.0058 in case of Gross domestic savings and 0.0383 in case of CNX Nifty returns. It indicates that the prob. Statistics of the individual variables is less than .05 in case of these variables. Therefore, these variables are significant in affecting the flow of funds into the Indian mutual funds industry. The coefficient of Interest rate is -0.298114. The negative value of the coefficient reveals negative association between the fund flows into the mutual fund industry and the Interest rate. The result is consistent with the fact that any hike in Interest rate is followed by increase in savings in other avenues of investments offering high interest. Further, the 'p' value in case of Consumer price Index is 0.4751, which is greater than 0.05. It shows that Inflation rate as proxied by Consumer price Index is insignificant in affecting the flow of funds into the Indian mutual fund industry.

The coefficient of Interest rate, exchange rate and growth rate is not found to be significant. The value of R square is quiet less (0.404928), it shows that 40.49% variation in the dependent variable is caused by the independent variables. The joint effect of all the independent variables together as depicted by Prob. (F-statistic) is less than .05, so these variables together have a significant impact on the flow of funds into the Indian mutual funds industry.

GRANGER CAUSALITY TEST

Regression analysis indicated that the selected macroeconomic variables considerably influence the flow of funds into the Indian mutual funds industry. Hence it becomes necessary to examine whether Mutual fund flows causes these variables.

Assumptions of the model

i)   Mutual fund flows and all independent variables are stationary

ii)   Schwarz information criterion is used to determine the number of lagged terms in the test. However the direction of causality may depend critically on the number of lagged terms included.

iii)   Error terms are uncorrelated.

Table-7
Results of Pair-Wise Granger Causality Test

Null Hypothesis:	F-Statistic	Probability	Criterion
CPI does not Granger Cause MFS	1.26519	0.3480	Accept
MFS does not Granger Cause CPI	0.22268	0.8067	Accept
MFS does not Granger Cause ER	1.51031	0.2943	Accept
ER does not Granger Cause MFS	1.11554	0.3873	Accept
MFS does not Granger Cause GDS	1.21600	0.3603	Accept
GDS does not Granger Cause MFS	0.19877	0.8249	Accept
MFS does not Granger Cause GR	3.08469	0.1199	Accept
GR does not Granger Cause MFS	0.38843	0.6940	Accept
MFS does not Granger Cause IR	0.08039	0.9237	Accept
IR does not Granger Cause MFS	0.04215	0.9590	Accept
MFS does not Granger Cause ISMR_NIFTY	0.17980	0.8398	Accept
ISMR_NIFTY does not Granger Cause MFS	0.47119	0.6455	Accept
Significant at 5 per cent level.			

The results of the Granger Causality test have been reported in Table 3. If the computed F value exceeds the critical F value at the chosen level (5%) of significance, null hypothesis of no causality between the variables is rejected.

The Granger Causality test revealed that no bi-directional causality exists between the macroeconomic variables and the mutual fund market. The real macroeconomic variables considered for the study have not been significantly influencing the investments of Mutual fund flows.

CONCLUSION

In the recent times, the domestic institutional investors such as mutual funds have acquired a considerable role in Indian equity market. This study analyses the association between domestic mutual funds and various macroeconomic variables using annual data of 15 years from April 2000 to March 2015. The study found that the Mutual fund flows are not considerably influenced by the macroeconomic variables, that is, Consumer price Index, Gross Domestic Savings, Exchange rate, growth rate, interest rate and nifty returns. This behaviour suggests that there are certain other macroeconomic variables that have an impact on the investments made by mutual funds. Overall, it can be concluded from the analysis that Real Economic variables are not significant in effecting the mutual funds market.

However, as it is evident that Real Economic variables are insignificant, inclusion of other macroeconomic factors such as Per Capita Income, wholesale price index, Money Supply, Index of Industrial Production, Gross Domestic Product, Call money rate, Forex reserves, Household savings, RBI Bank rate etc. may improve the analysis of the dynamic interaction between Mutual funds market and Macroeconomic variables.

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Digital Economy in India: Technical Challenges

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ABSTRACT

Digital economy is a worldwide network of economic activities facilitated by information and communication technologies. The true brunt of demonetisation might hit the masses by the end of the current fiscal year. Cyber history of the financial system casts a gloomy shadow on the security assurances made by the government and other security providers. 3.2 million debit cards were compromised in October, 2016. Digital wallets in India lack hardware-based security layer. In NRI, India was ranked 91 out of 139 countries. Digital currencies provide greater anonymity than credit cards. However, digital currencies are a disruptive technology. Liberty Reserve(now defunct) was the "coin of the realm". India appointed its first chief information security officer (CISO). Transactions are secured with 128 bit SSL encryption and two factor authentication. A comprehensive approach to physical, technical, and administrative security controls is the need of the hour. The creation of a National Cyber Security Agency (NCSA) would improve India's resilience and defense systems.

INTRODUCTION

Digital economy is a worldwide network of economic activities facilitated by information and communication technologies. In the words of Nicholas Negroponte, founder of Massachusetts Institute of Technology's Media Lab, digital economy entails "using bits in place of atoms." The term was coined by Don Tapscott, author of the 1995 best-seller, " The Digital Economy : Problem and Peril in the Age of Networked Intelligence ". As advocated by Harvard professor, Kenneth Rogoff, in his book, " The Curse of Cash", the pitfalls of cash, though seeming to be stupefyingly mundane to most, lie at the heart of most intractable public finance and monetary problems. Modern Keynesian macroeconomic models either marginalize or banish entirely the role of cash.[1] The Indian government and fintech corporations have given a strong impetus to make India a cashless and digitised economy. Over the past one year, the central government has undertaken a plethora of initiatives which have resulted in the rise in mobile and internet transactions. The year ended with Prime Minister, Narendra Modi's "surgical strike" on black money and corruption as he announced the demonetisation of INR 1000 and INR 500 notes (which comprised 86% of the CIC) on November 8. Despite mixed reactions from the business class, advocates of digitisation are basking with exuberance, especially fintech startups. According to the RBI's Report, E-wallet platforms such as Paytm, FreeCharge, PayU India and MobiKwik have witnessed a whooping growth of over 1000 percent in the last few months.[6] As we transgress to a new epoch, cyber security continues to be a major concern in the digital payment ecosystem. Given the

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fact that more people will now inevitably opt for online payment, it is very critical both for users and digital payment solution providers to maintain a high level security posture to safeguard themselves from the menace of cyber criminals.

The fundamental key concepts that enable digital economy are :

- **Infrastructure -** Hardware, Software and Networks
- **E-Business -** Processes entailing to the functionalities of businesses
- **E-Commerce -** Digital transactions involved between consumers and entities

As the Government initiates the creation of digital expressways and smart platforms, cyber goons will also take advantage of the same to break the walls as the technology is prone to many attack vectors. Hence, embedding security measures at every iota is the need of the hour.

Contributions: Trying to bridge the gap in formulating a comprehensive and all compassing strategy to counter cyber terrorism, the primary objectives of this paper are :

1. *Establishing a clear definition of Cyber Attacks and segmentation of potential threats to the Indian Economy*
2. *Enlisting and scrutinising the preparedness in cyber security discourse and the identification of the shortcomings*
3. *International Experience in Digitisation*
4. *Exploration into the pros and cons of adopting digital (crypto) currencies*
5. *Drawing inferences and concocting suggestive measures*

1. CYBER ATTACKS

With the onset of a new epoch, businesses and governments are transgressing their modus operandi to a more sophisticated yet transparent tool - the new age computers (especially the Internet), which has left them susceptible to threats of malicious activities and cyber-crimes. Cyber criminals use computers and technology either as a tool to commit the crime, as a storage device, or as a target of the crime.

The history of cyber security as a securitizing concept begins with the disciplines of Computer and Information Science. One of the earliest usage of cyber security was in the Computer Science and Telecommunications Board's (CSTB) report from 1991, Computers at Risk: Safe Computing in the Information Age which defined "security" as the "protection against unwanted disclosure, modification, or destruction of data in a system and also the safeguarding of systems themselves".

Threats arise from software as well as hardware failures and cannot be corrected through perfecting digital technology and programming; there is, in short, an inherent ontological insecurity within computer systems. These threats can be segmented into three broad categories :

- Physical - Damaging the computers with conventional means
- Semantic - Key information of the system is altered without the user's knowledge
- Syntactic - The logic of the system is altered to make unprecedented outputs

The most common means of cyber attacks are :

- Hacking - Unauthorised access to a computer or a network system via packet sniffing, tempest attack, password cracking, buffer outflow, etc
- Trojans - Programs designed to hide their true functioning
- Viruses - Programs that infect systems by changing other programs
- Worms - Self replicating programs that perform malicious actions
- E-Mails - Host programs carrying worms and viruses
- Denial of Service - Attacks denying authorised persons access to a computer network
- Cryptology - High frequency encrypted voice/data links
- Cracking - Breaking into a computer system
- Phishing - Attempting to acquire critical user information
- Phreaking - Cracking a phone or communication network
- Spyware - Software that covertly gathers user information, usually for advertising purposes

Phishing relies on the ability of the perpetrator con a victim by the use of seemingly legitimate websites, e-mails or communications to deceive bank customers into disclosing sensitive information, such as bank account information, social security numbers, credit card data, passwords or financial personal identification numbers (PIN) for siphoning off moderate sums from various users in order to prevent detection by monitoring authorities.

One of the most insidious types of Trojan horse is a program that claims to rid your computer of viruses but instead introduces viruses onto your computer. Another typical malicious use of a Trojan horse is to have it sit on a system and capture keyboard strokes and send them back to the perpetrator. A good example of worms and Trojan horses that target financial institutions would be the Bugbear family.

Bugbear is a mass-mailing worm that spreads through networks. It also infects a select list of executable files. Bugbear possesses keystroke logging and backdoor capabilities and may even disable the system's anti-virus software. It specifically handles infections at financial institutions differently than other infections. This functionality will cause the worm to send sensitive banking data (files peculiar to banking computer systems and deliberately sought by the worm Bugbear) to one of 10 hard-coded, public Internet email addresses. WinWhatWhere software can record all keystrokes on a personal computer and send them to some remote location on the Internet.

Spyware applications are typically bundled as a hidden component of freeware or shareware programs that can be downloaded from the Internet. Once installed, the spyware monitors user activity on the Internet and transmits that information in the background to someone else. Spyware can also gather information about e-mail addresses and even passwords and credit card numbers. Because spyware is using memory and system resources, the applications running in the background can lead to system crashes or general system instability. They have the ability to monitor keystrokes, scan files on the hard drive, snoop other applications (such as chat programs or word processors), install other spyware programs, read cookies and change the default homepage on the Web browser—consistently relaying this information back to the spyware author who could use it for advertising/ marketing purposes, sell the information to another party or use it to perpetrate ID theft.

Distributed denial of service (DDoS) is a modified DoS where multiple attacks are launched simultaneously from various innocent client computers to a single target, flooding the computer server system and locking it up. DoS/DdoS attacks have less of an impact on financial institutions and are less devastating to the overall entity than the other forms of attack.

Notwithstanding the slew of measures taken by the authorities before and after its increased push to digital payments, cybersecurity experts have spoken of a potential threat called breach blindness wherein an attacker hacks your system and waits for as long as eight-nine months before he decides to make a move. Now because of demonetisation, a lot of people and organisations may not get affected immediately but nine months later.

2. CYBER SECURITY : INDIAN SCENARIO
In the wake of increasing cyber threats, India has adopted a myriad of steps so as to counter cyber terrorism. Various organisations and reforms have been placed for the same
.

2.1 Organisations

● **National Informatics Centre (NIC) -** An organisation providing network backbone and e-governance support to the Central Government, State Governments, Union Territories, Districts and other Governments bodies. It spreads wide range of information and communication technology services including nationwide communication network for decentralised planning and wider transparency of national and local governments.

● **Indian Computer Emergency Response Team (Cert-In) -** It is the apex body that mandates states, ensures security of cyber space in the country by enhancing the security communications and information infrastructure, through proactive action and effective collaboration aimed at security incident prevention and response and security assurance.

● **Indo-US Cyber Security Forum (IUSCSF) -** Under this forum (set up in 2001) high power delegations from both side met and several initiatives were announced. Highlights are :

○ Setting up an India Information Sharing and Analysis Centre (ISAC) for better cooperation in anti hacking measures.

○ Setting up India Anti Bot Alliance to raise awareness about the emerging threats in cyberspace by the Confederation of Indian Industry (CII).

○ Ongoing cooperation between India's Standardisation Testing and Quality Certification (STQC) and the US National Institute of Standards and Technology (NIST) would be expanded to new areas.

○ The R&D group will work on the hard problems of cyber security. Cyber forensics and anti spasm research.

○ Chalked the way for intensifying bilateral cooperation to control cyber crime - between the two countries.

2.2 Reforms

India appointed its first chief information security officer (CISO) in 2015. The appointment underlines India's commitment to combating cyber attacks. It will help India develop the vision and policy to fight cybercrime and manage cybersecurity more effectively. India is also in the process of setting up national cyber security architecture. The architecture will provide a framework for designated agencies to monitor, certify and fortify India's networks in accordance with the law. Some other reforms that are being undertaken by the central government are :

● Creation of a 'Threat and Situational Awareness Test Bed' to generate triggers on existing and potential cybersecurity threats

- CERT-In is setting up a Botnet Cleaning and Malware Analysis Centre for detection of computer systems infected by malware and to enable cleaning and securing systems of end users to prevent further malware infections.
- A digital payments division has also been set up under CERT-In to monitor any potentially harmful activity that occurs on any of the channels on which electronic payments are taking place in the country.
- In 2015, the Cabinet Committee on Security approved the government's proposal to set up a Rs 1,000-crore fund to be used in areas of research and development of cyber-security products and systems.
- An experts committee under the Chairmanship of former law secretary, TK Viswanathan, and members from NSCS, the Department of Legislative Affairs, the Department of Justice and the Central Bureau of Investigation, is readying a list of possible amendments in the existing domestic cyber laws to strengthen security and consumer rights.
- The RBI has set up a Cyber Crisis Management Group to address any major incidents and the central bank has set up an IT subsidiary, which would focus, among other things, on cyber security within RBI as well as in regulated entities.

These come at a time when cyber security incidents are showing a steady increase, with a total number of 39,730 incidents reported the first 10 months of 2016, as against 44,679 and 49,455 observed during the year 2014 and 2015 respectively, according to the information reported to and tracked by CERT-In. After the demonetisation announcement in November, the subsequent digital push has precipitated the need for ramping up cybersafety and online transactions

2.3 Law

The usage and issuance of digital wallets are governed under the RBI's Master Circular on Pre-PaidPayment Instruments. Section 43A of the IT Act is the sole clause which provides for security and privacy of the information held by private corporations. Under this section, fintech corporations like e-wallet providers are mandated to maintain 'reasonable security practices and procedures'. The IT Sensitive Personal Data Rules, 2011, which were issued under Section 43A, require corporations to have security practices proportionate to the data in their possession. Such practices are required to be documented. If any loss is caused due to the lack of such procedures, or their negligent implementation, the customer is liable to be compensated. There is no upper limit on the amount of compensation.

While India still has a long way to go completely 'digital', owing to a lack of preparedness in several aspects, the budget has a clear focus on building long-term digital infrastructure and the cashless ecosystem for the country. However, there is currently no national agency to assess the nature of cyber threats and respond to them effectively. While CERT- In has inked several crucial MoUs with countries

such as the US and has extended collaboration with tech majors like Microsoft, there is an urgent need to strengthen the existing cyber law to deal the cyber crimes in a more efficient way.

3. ISSUES WITH CURRENT STANDARDS

Despite the slew of measures introduced by the government, cyber history of the financial system narrates a different story altogether and casts a gloomy shadow on the security assurances made by the government and other security providers.

3.1 Security Lapses

In October 2016, the country was rocked by the news of 3.2 million debit cards being compromised. These included cards of Visa and MasterCard stable and belonging to various banks including ICICI, Axis bank among others. While the exact extent of damage of the same could not be gauged it clearly indicates the vulnerability that digital money faces. September witnessed yet another penetration as details about India's top secret Scorpene submarine program were leaked online.

A report by Symantec, dated May 17, 2016, revealed several breaches to multiple Indian organisations by "Suckfly" - a cyber espionage group, beginning in April 2014 through 2015. Economic infrastructure of the nation was targeted as the compromised systems belonged to the central government, a vendor to the largest stock exchange, a financial institution and an e-commerce company, there was however, no disclosure of identities. Suckfly's modus operandi is signing its malware with stolen digital certificates, just as the Stuxnet virus tried to sabotage the Iranian nuclear centrifuges. The primary causes of such doomsday scenarios are identified as the dis-enabling of two-factor authentication being for credit card transactions, leakage of credit card details, passwords and other information paving a way for unauthorised money transfers and manipulation of the stock exchange.

In the following week, Kaspersky Lab disclosed intercepting breaches from another cyber espionage group, Danti to the Indian government systems via diplomatic entities. Such data breaches descry vulnerabilities in the preparedness to counter cyber terrorism.

3.2 Shortcomings

According to the claims of Qualcomm, all the digital wallets in India lack hardware-based security layer, which make them prone to hack. Apps used SMS based OTP verification method, which is quite ineffective for controlling brute force and other advanced hacking techniques. And, as per the terms and conditions of these apps, the user is liable for any loss or stolen money. As per the Indian study, named "2016 Cost of Data Breach Study: India" Indian companies have to pay an increased(9.5 percent) average total cost of a data breach as compared to the 8.7

percent increase in the per capita cost and an 8.1 percent bulge in the average size of a breach grew.[4] Thus cyber security can offer a great avenue for upcoming ventures.

CERT-IN is responsible for "responding to computer security incidents as and when they occur" and also collecting information on and issuing "guidelines, advisories, vulnerability notes and white papers relating to information security practices, procedures, prevention, response and reporting of cyber incidents." Yet, its website does not mention the Backdoor.Nidoran exploit which Suckfly allegedly used to gain access during at least one of its attacks. The CVE-2015-2545 vulnerability that Danti used, according to Kaspersky, is also unlisted.

These instances casts aspersions on the preparedness of the government and integrity of the cyber and IT laws in India. However, Section 43A shows laxity to the extent of its implementation. Proving the security standards documented acquits any corporation of further liability even it fails to upgrade its security. Research also articulates that many corporate juggernauts fail to comply with Section 43A. Several wallet providers, in their Terms & Conditions, disclaim liability for any bugs or security breaches in the softwares used. There is a lack of clarity on the extent to which this disclaimer is binding. This can be attributed to the allowance given to the corporates to set adequate standards.

The law needs to assign credibility to the companies as the customers entering the agreements have no understanding of the security requirements. An annual cyber security audit mandated by a central authority can bridge the gap. In order to protect fintech corporations and their customers, laws to establish their rights and liabilities need to be placed. With the economy of the nation now being hardwired into the digital medium cyber threat emerges as a larger challenge than ever before. Hence it is time India rises up to the challenge and combat it effectively.

According to the IMF World Economic Outlook's Information Economy Report 2016, Singapore, Finland and Sweden have been the highest performers in NRI while India was ranked at 91 out of 139 countries. The World Economic Forum standardised the Networked Readiness Index (NRI) to measure the capabilities of countries to use information and communication technologies for increased competitiveness and ensure well-being. It has transformed as a key indicator of the performances of economies in the digital world. Inadequate digital economic infrastructure and low skill levels among the masses prove to be the chief deterrents in our journey to digitisation. The report illustrates our weak sections to be low literacy rate, low enrolment ratio in secondary education (around 30% each) and feeble internet penetration (15%).[7]

Many countries, especially the Scandinavian nations, have taken a lead in transitioning to a digital economy and have virtually removed all cash. India, being a vast and variegated economy cannot implement the same standards as these

smaller and homogeneous economies, but we can draw inferences, evolve the methods and implement them as we strive to realise our goal of phasing out cash from India.

4. INTERNATIONAL EXPERIENCE

Sweden's head start in the field began in the 1960s, when banks persuaded employers and workers to use digital bank transfers for wages, with credit and debit cards receiving a boost in the 1990s when Sweden's banks started charging for cheques. Cards are now the main form of payment: according to Visa, Swedes use them more than three times as often as the average European, making an average of 207 payments per card in 2015.

For many people, cash signifies autonomy, but for the young or the technologically adventurous it's an inhibition on the freedom of self-made exchange. The romance of this notion helps account for the success of Swish, a hugely popular app developed jointly with the major banks including Nordea, Handelsbanken, SEB, Danske Bank and Swedbank, uses phone numbers to allow anyone with a smartphone to transfer money from one bank account to another in real time. Its interface is so simple that it is used for church collections and other basket-passing fare. Stockholm's Metro does not accept cash payments. A similar Danish app, MobilePay, was used by over 3 million Danes – in a country of 5.6 million – to make some 90 million transactions last year. Each number registered for transactions is unique to this telephone. Even if somebody broke through all the interlocking keys on one phone, they would have to start all over again on the next which reduces the chances of a scalable fraud.

The InterNational Committee for Information Technology Standards (INCITS), an ANSI-accredited organization, develops US standards for information and communications technologies. It comprises of technical committees (TCs) like B10 (identification cards and related devices), CS1 (cyber security), M1 (biometrics), and T6 (RFID technology) that create standards for different technology areas. The securitization of Internet access in countries such as China, Singapore, and Myanmar is legitimized through references to national, cultural as well as regime security.[2]

5. SUGGESTIONS

Unless one understands and owns the game of identity, companies will continue facing growth constraints caused because of frauds and attacks, resulting in lack of confidence. Similarly, while people are getting comfortable with mobile wallets and banking through apps and smartphones, WI-Fi networks continue to have major security flaws that can make it very dangerous to conduct transactions using a mobile device. All the transactions are secured with 128 bit SSL encryption and two factor authentication.

5.1 Ethos of a Secure System

- **Preventive -** Secure card readers, encryption, spyware, and company policies and procedures
- **Detective -** Archival seals, log messaging controls, and regular e-audits
- **Deterrent -** Closed circuit cameras, rejection after incorrect password use, and multi - departmental approvals
- **Corrective -** Isolation of servers, updated firewalls and procedures
- **Recovery -** Dual data sets, integrity services for repairs, and law enforcement and legal action

5.2 Cryptocurrencies

The major impediment while phasing out cash in a country like India would be the resistance of the masses as cash provides a level of anonymity which is endeared by every individual. However, certain digital currencies have been evolved and globally accepted which if implemented can attenuate the inertia. Digital currencies provide greater anonymity than credit cards. In Bitcoin, for example, accounts are pseudonymous and the protocol is designed to encourage the use of new account numbers for each transaction. These features are touted by Bitcoin supporters as a guarantee of anonymity, which has drawn privacy-conscious consumers (and criminals) to the currency. However, associating identities with Bitcoin addresses is possible, particularly when interacting with online currency exchanges.

5.2.1 Advantages

The decentralized design of Bitcoin and other digital currencies protects against inflation. Traditional currencies rely on a central bank to regulate the money supply, introducing new money into circulation asneeded. The quantitative easing policies adopted by the U.S. Federal Reserve have attracted criticism about potentially causing inflation. Bitcoin, in contrast, uses cryptography to guarantee a relatively fixed money supply, which is allowed to grow at regular intervals. Periodically, the amount of money introduced is halved, until no more Bitcoin currency is brought into circulation. Hence, instead of central bank decisions driven by human prognostications, Bitcoin relies on an algorithm to limit the growth of the money supply. This approach is very appealing to inflation "hawks" who have literally bought into Bitcoin.

5.2.2 Limitations

Criminals also have begun to (ab)use digital currencies as a platform for exchange. Like all of us, criminals desire reliable bank accounts without providing identifying information to devoid their victims of recompense. Criminals in underground forums frequently paid each other for goods and services using the now-defunct Liberty Reserve(then, the "coin of the realm"). Thousands of online

Ponzi schemes called high-yield investment programs (HYIPs) rely on obscure digital currencies such as Perfect Money.[8]

Consumers looking to use digital currencies for legitimate transactions can be bitten badly by an exchange-rate risk as well. Since 2010, at least 40 Bitcoin currency exchanges have opened(that charge exchange fees). But, eighteen of these have subsequently closed, leaving their depositors in the lurch.[3] The Bitcoin-dollar exchange rate has fluctuated wildly, with its genesis between $5 and $15, peaking inexorably over $1000 in November 2013 before falling sharply, and regaining proximity to the $1000 mark this year.[5] Such a propense volatility of Bitcoin's value makes consumers skeptical of caching or spending the currency. Piling on to the inertia is the irreversibility of digital currency transactions, even if they are fraudulent. The 1970s witnessed a rampant transition to credit card transactions owing to strong government regulations requiring reimbursement of disputed transactions. Absent such protection, digital currencies could see very low adoption rates as long as the benefits outweigh the risk.

5.2.3 Remarks
The bottom line is that digital currencies are a disruptive technology. They can lower online payment fees and even offer cryptographic guarantees about the money supply. But the risks they introduce – from abuse by criminals to widespread customer fraud – are substantial. However, quoting Rogoff again, "the public ledger (the blockchain) contains a record of all transactions, and even though these are pseudonymous, the government can use other pieces of information surrounding the transactions to try to deconstruct them and pull out identities."[1]

5.3 Technical Solutions
- **Blockchain technology -** Developed to reinforce digital currency bitcoin, considered the most efficient technology against cyber fraud that allows financial transactions to be verified electronically over a network of computers. The authentication, nonrepudiation and transaction integrity is built into the protocol
- **Cloud computing -** To pave way over tricky areas such as implementation gaps in demonetization, tracing black money, and successful digital wallets
- **Cognitive computing -** The replication of human potential of reasoning in a computerized model. It comprises self-learning systems that use data mining, decision making and natural language translation and processing the way human brain does.
- **Serverless computing -** Makes running of apps completely invisible. Upsurge in the IoT and Mobile application is fuelling its advancement.
- **App Analyzer -** Developed by Google, a modified version of Safe Browsing that

specifically hunts for dangerous apps in Google Play, other app stores, and on the web, and warns users on identifying any unsafe application.

- **Verify Apps -** Separate protection that runs directly on Android devices, proactively checking more than 6 billion apps and 400 million devices every day.
- IDP (Intrusion Detection and Protection) - Multi-layered security protocol
- Fraud detection software, voice print recognition, and smart chips to replace magnetic stripes on cards
- Upgrading existing password single-factor authentication systems to two-factor systems
- Strengthening educational programs to help consumers avoid online scams
- Plan a continuing emphasis on information sharing among financial institutions, government and IT providers.
- Feed in card details manually every time when paying online instead of saving them online

6. CONCLUSIONS

The creation of a National Cyber Security Agency (NCSA), responsible for cybersecurity transformations in policy formulation and implementation would improve India's resilience and defense systems. As the paper has sought to underscore, cyber security stands at the intersection of multiple disciplines and it is important that political, technological, social, anthropological and academic communications are brought to parry the imminent threats to the digital payment ecosystem.

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Investor Perception towards Mutual Fund Investment - A Gender Based Study

Gaura Nautiyal*

ABSTRACT

India is one of the few countries in the world which, according to the World Bank, has a household savings rate that is greater than 30%. Despite this, investment options such as mutual funds and equity instruments have a very low penetration rate, especially among rural households. Although a rapid increase in mutual fund investments has been witnessed over the last few years, with an increase of 38.47% from March 2016 to March 2017 having been declared by AMFI, much can be done in this area. Mutual Funds can be a good way of initiating new investors to financial investment securities and the capital market. The objective of this study is to determine whether an association exists between gender and the various attributes of perception towards mutual fund investments. Findings of this study can help companies design better product offerings in order to improve the penetration rate of mutual fund investments.

Keywords: Mutual Funds, perception, AMFI, penetration rate, SIP

INTRODUCTION

The focus on financial inclusion by the Indian government over the last few years seems to be bringing in positive results, in some areas at least, as indicated by the SEBI Investor Survey 2015 which was released in early 2017. The survey estimated that there were about 3.37 crore investor household in the country which were split between urban and rural areas in a 70:30 ratio. Awareness regarding bank accounts was as high as 99.9% followed by Life Insurance at 94.7% and post office savings at 89.4%. Overall awareness regarding mutual funds and equities was less than 30% and even worse in rural households where less than 1.4% of those surveyed indicated any awareness regarding these two investment avenues, although the household saving rate in more than 25% of rural households was greater than 40%.

Findings further indicate that 95% of Indian households preferred to invest their savings in bank deposits. Mutual funds were placed sixth with only 9.7% of respondents preferring to invest in some form of mutual fund scheme. In urban areas, however, mutual funds are preferred over other forms of financial securities. Among the regular mutual fund investors about 60% prefer to adopt the systematic investment plan (SIP) mode for investment.

Considering that household savings in India, according to (trading economics, 2017) has exhibited a phenomenal increase from Rs. 9943.96 billion in 2007 to Rs. 26099.21 billion in 2016, a lot needs to be done to create awareness about financial instruments as vehicles of investment which will not only diversify avenues for investors but will also increase access to funds for companies.

Mutual Funds can be a good way of introducing new investors to the capital market. A mutual fund is defined as "a professionally-managed investment scheme, usually run by an asset management company that brings together a group of people and invests their money in stocks, bonds and other securities". Thus, a mutual fund is an investment option that offers investors the benefit of risk diversification even when investing relatively small amounts of money.

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Investing in Mutual Funds offers several benefits to the investor such as portfolio diversification, professional management of investment, liquidity and tax benefits among others. For instance there is no long term capital gain tax on equity mutual. In case of Income (debt) funds, long term capital gains apply in case of holding period of 3 years or more. Additionally, investments up to a limit of Rs 1,50,000 in a particular class of tax saving mutual funds called Equity-linked savings scheme (ELSS) are exempt from tax. ELSS is a type of open-ended, diversified mutual fund scheme offering tax-free returns that requires a minimum investment of Rs. 500 per month. They have a lock-in period of only 3 years (Cleartax, 2017).

Problem Definition
Is there a statistically significant difference between male and female perception towards mutual fund investments?

Mutual Fund Industry in India – Set for Takeoff
The Mutual Fund industry in India is regulated by the Securities and Exchange Board of India (SEBI). In addition, The Association of Mutual Funds in India (AMFI), a non-profit organisation incorporated on August 22, 1992, operates as an industry self regulator having as its members all the 42 Asset Management Companies that are registered with SEBI.

According to AMFI data, as of April 2017, the total number of accounts in the Indian Mutual Fund industry stood at 5.61 crores. Assets under management (AUM) of the Indian mutual fund industry witnessed a six fold increase over the last 10 years from Rs. 3.26 trillion in March 2007 to Rs. 18.58 trillion as of March 2017. Over the last one year itself AUM has increased by a spectacular 37.09% from Rs. 13.55 trillion in March 2016 (AMFI, 2017).

This increase in mutual fund investments is powered by both institutional as well as individual investors alike. Investment in mutual fund schemes by individual investors in fact stood at Rs. 8,52,735 crores as of March 2017, indicating a phenomenal year-on-year increase of 38.47%. Equity oriented schemes, at 60.58% of the total, accounted for the largest proportion of individual investment in mutual fund schemes. Investment in equity oriented schemes by individual investors increased by 46.07% over the same period (AMFI, 2017).

Literature Review
Srilakshmi S. & Sekar B. (2016) in their study conducted in Tamil Nadu, India, found that equity schemes were the most preferred Mutual Fund schemes and majority of investors considered a moderate level of risk associated with Mutual Fund investments. Das (2012) in a study involving 250 respondents in the state of Assam, India, concluded that a statistically significant relationship existed between gender and extent of satisfaction with Mutual Fund investments.

Khitoliya Preeti (2014) found that there was a statistically significant relationship between gender and risk-return trade-off related to MF investments. In the study conducted in Delhi- NCR region of India they found that 55% of the male respondents were willing to take higher risk if expected return was high while only 22% of the female respondents were similarly willing.

In a study involving 250 respondents in Tamil Nadu, India, Kalaiselvi M., (2016) concluded that majority of investors (30%) preferred equity funds, also it was determined that newspapers and magazines were the most preferred source of information for majority (60%) of respondents.

Noor Nahar Begum & Sarabia Rahman (2016) in a study conducted in Dhaka, Bangladesh, concluded that there is an association between the gender of the respondent and their attitude towards mutual funds. A significantly large proportion of male respondents (39%) indicated a positive attitude towards mutual funds as compared to only 5% of the females surveyed.

Kalathinkal Riyas et al (2015) in their study of 100 respondents in Kozhikode district of India found that growth (equity) schemes were most preferred (49%) by mutual fund investors, while whereas 37% preferred income schemes. Also close ended schemes were preferred by only 16% of respondents with the remaining 84% equally divided between open ended schemes and interval schemes. The researchers also concluded that television was the major source of information, followed by newspapers for most respondents.

A 2014 study conducted in the city of Gwalior by Chaturvedi S., Bhakuni P. concluded that that there was no statistically significant association between gender and risk perception towards mutual fund investments. Similarly no statistically significant association between gender and Gupta S.V. et al in a 2011 study involving 100 respondents in Ahmedabad, Gujarat, concluded that investors prefer to put between 10-30% of their total investment in mutual fund schemes. Majority of investors prefer to hold their investments for anything between 1 to 5 years.

The literature reviewed does not help in arriving at a proper conclusion because some researchers, Khitolya P (2011), Das (2012) and Noor Nahar Begum & Sarabia Rahman (2016) found a significant association between gender and perception towards mutual funds. Other researchers, meanwhile, (Chaturvedi & bhakuni, 2014) concluded that no such significant association existed. Most of these studies focused upon association between gender and the risk appetite of investors or the type of mutual fund preferred. However, a research gap exists in terms of association between gender and perception regarding factors such as ideal holding period of mutual funds, best source of information regarding mutual funds, and proportionate investment in mutual funds.

Objective of the Study

To analyze perception of investors towards mutual funds and to determine whether gender of an investor is associated with his/her perception regarding:

- The best Mutual Fund type for investment.
- The ideal holding period for mutual fund investment.
- The ideal proportionate investment in mutual fund.
- The risk associated with mutual fund investments.
- The most reliable source of information with reference to mutual fund investment

Research Methodology

The study was conducted in the Delhi-NCR region of India. An instrument comprising of 16 items was designed and distributed to 150 people of whom 127 responded. After perusing the filled responses, 112 were found to be complete and acceptable and were included for data interpretation purposes. Males accounted for 64 of the total respondents while females numbered 48.

In the research instrument a close-ended item referring to the perception regarding the best mutual fund types for investment respondents were asked to choose any one from 5 choices – balanced plans, equity plans, income plans, gilt plans and others.
When querying about investor perception regarding ideal holding period for mutual fund investments, respondents could choose from 4 options – up to 1 year, more than 1 up to 3 years, more than 3 up to 5 years, and more than 5 years.

With regard to investor perception regarding ideal proportionate investment in mutual fund respondents were asked as to what proportion of their total annual investment do they believe should be invested in mutual fund schemes. Respondents could choose any one of the following options – less than 10%, 10%-25%, 25%-50% and above 50%.

The item enquiring about investor perception regarding risk associated with mutual fund investments required respondents to choose any one of the following – low risk, moderate risk and high risk.

For the perception regarding what investors considered as the most reliable source of information with reference to mutual fund investments, investors were required to choose from 4 options – investment focused T.V. programs, Internet, Friend/Relatives and Sales Representatives of asset management companies (AMCs)

SPSS was used for analysis purposes

Hypotheses

H1: There is no statistically significant association between gender and perception regarding the best Mutual Fund type for investment.

H2: There is no statistically significant association between gender and perception regarding ideal holding period for mutual fund investment.

H3: There is no statistically significant association between gender and perception regarding ideal proportionate investment in mutual fund.

H4: There is no statistically significant association between gender and perception regarding risk associated with mutual fund investments.

H5: There is no statistically significant association between gender and perception regarding reliable source of information with reference to mutual fund investment

Data Analysis and Interpretation

Chi square test for goodness of fit was used to determine the existence of association between gender and the variables under study. Cramer's V was used to determine the strength of association between the two variables.

Table 1: Cross-tabulation, Chi Square Test and Symmetric Measures (Gender & Perception regarding best Mutual Fund Type for Investment)

Gender * Perceived_Best_MF Crosstabulation

		Perceived_Best_MF					Total
		Balanced Plans	Equity Plans	Income Plans	Gilt Plans	Others	
Male	Count % within Gender % within Perceived_Best_MF % of Total	14 21.9% 66.7% 12.5%	20 31.2% 64.5% 17.9%	8 12.5% 33.3% 7.1%	8 12.5% 47.1% 7.1%	14 21.9% 73.7% 12.5%	64 100.0% 57.1% 57.1%
Female	Count % within Gender % within Perceived_Best_MF % of Total	7 14.6% 33.3% 6.2%	11 22.9% 35.5% 9.8%	16 33.3% 66.7% 14.3%	9 18.8% 52.9% 8.0%	5 10.4% 26.3% 4.5%	48 100.0% 42.9% 42.9%
Total	Count % within Gender % within Perceived_Best_MF % of Total	21 18.8% 100.0% 18.8%	31 27.7% 100.0% 27.7%	24 21.4% 100.0% 21.4%	17 15.2% 100.0% 15.2%	19 17.0% 100.0% 17.0%	112 100.0% 100.0% 100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.850[a]	4	.043
Likelihood Ratio	9.952	4	.041
Linear-by-Linear Association	.058	1	.810
N of Valid Cases	112		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.29.

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	.297	.043
	Cramer's V	.297	.043
N of Valid Cases		112	

a. Not assuming the null hypothesis.
b. Using the asymptotic standard error assuming the null hypothesis.

The cross-tabulation between gender and perceived best type of Mutual Fund plan

for investment (Table 1) indicates that 'Equity Funds' were perceived as the best by 31% of male respondents followed by 'balanced funds' which were preferred by 21.9% of surveyed males. 'Income Funds' were perceived as the best by one-third of the female respondents followed by 22.9% of females perceiving 'equity funds' as the best mutual fund type for investment purposes. The data was analyzed using a chi square goodness of fit test for $\alpha = 0.05$. The null hypothesis 'there is no statistically significant association between gender and perceived best mutual fund type for investment' was rejected, $\chi^2(4) = 9.850$, $0.043 \leq 0.05$. Cramer's V value of .297 indicates a weak to moderate association between the two variables.

Table 2: Cross-tabulation, Chi Square Test and Symmetric Measures (Gender & Perception regarding ideal holding period for Mutual Fund Investments)

Gender * Ideal_Holding_Period Crosstabulation						
		Ideal_Holding_Period				Total
		Up to 1 year	More than 1 up to 3 years	More than 3 up to 5 years	More than 5 years	
Male	Count	18	20	14	12	64
	% within Gender	28.1%	31.2%	21.9%	18.8%	100.0%
	% within Ideal_Holding_Period	69.2%	50.0%	51.9%	63.2%	57.1%
	% of Total	16.1%	17.9%	12.5%	10.7%	57.1%
Female	Count	8	20	13	7	48
	% within Gender	16.7%	41.7%	27.1%	14.6%	100.0%
	% within Ideal_Holding_Period	30.8%	50.0%	48.1%	36.8%	42.9%
	% of Total	7.1%	17.9%	11.6%	6.2%	42.9%
Total	Count	26	40	27	19	112
	% within Gender	23.2%	35.7%	24.1%	17.0%	100.0%
	% within Ideal_Holding_Period	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	23.2%	35.7%	24.1%	17.0%	100.0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.974[a]	3	.396
Likelihood Ratio	3.022	3	.388
Linear-by-Linear Association	.183	1	.669
N of Valid Cases	112		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.14.			

Symmetric Measures		
	Value	Approx. Sig.
Nominal by Nominal Phi	.163	.396
Cramer's V	.163	.396
N of Valid Cases	112	
a.Not assuming the null hypothesis.		
b. Using the asymptotic standard error assuming the null hypothesis.		

When analysing for association between gender & perception regarding ideal

holding period for Mutual Fund investments (Table 2), it was observed that a holding period of between 1 to 3 years was the most preferred choice among both genders with 31.2% of male respondents and 41.7% of female respondents choosing it. The data was analyzed using a chi square goodness of fit test for $\alpha = 0.05$. The null hypothesis 'there is no statistically significant association between gender and perception regarding ideal holding period of Mutual Fund investments' was not rejected, $\chi^2(3) = 2.974, 0.396 \geq 0.05$. There is weak association between the variables as indicated by the Cramer's V value of 0.163.

Table 3: Cross-tabulation, Chi Square Test and Symmetric Measures (Gender & Perception regarding ideal proportionate investment in Mutual Funds)

Gender * Tot_Invest_in MF Crosstabulation						
		Tot_Invest_in MF				Total
		Less than 10%	10%-25%	25%-50%	Above 50%	
Male	Count	11	30	12	11	64
	% within Gender	17.2%	46.9%	18.8%	17.2%	100.0%
	% within Tot_Invest_in MF	44.0%	60.0%	57.1%	68.8%	57.1%
	% of Total	9.8%	26.8%	10.7%	9.8%	57.1%
Female	Count	14	20	9	5	48
	% within Gender	29.2%	41.7%	18.8%	10.4%	100.0%
	% within Tot_Invest_in MF	56.0%	40.0%	42.9%	31.2%	42.9%
	% of Total	12.5%	17.9%	8.0%	4.5%	42.9%
Total	Count	25	50	21	16	112
	% within Gender	22.3%	44.6%	18.8%	14.3%	100.0%
	% within Tot_Invest_in MF	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	22.3%	44.6%	18.8%	14.3%	100.0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.810[a]	3	.422
Likelihood Ratio	2.817	3	.421
Linear-by-Linear Association	1.925	1	.165
N of Valid Cases	112		
a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.86 .			

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Phi	.158	.422
	Cramer's V	.158	.422
N of Valid Cases		112	
a. Not assuming the null hypothesis.			
b. Using the asymptotic standard error assuming the null hypothesis.			

As indicated in Table 3 above, respondents, irrespective of gender, preferred to

allocate between 10-25% of their total investment in   mutual fund schemes, with 46.7% of males and 41.9% of females surveyed choosing this option. The chi square test indicated a p value of .422 which is greater than α = 0.05. Thus the null hypothesis 'there is no statistically significant association between gender and perception regarding ideal proportionate investment in Mutual Fund schemes' was not rejected, $\chi^2(3) = 2.810, 0.422 \geq 0.05$. A Cramer's V value of .158 indicates weak association between the variables.

Table 4: Cross-tabulation, Chi Square Test and Symmetric Measures (Gender & Perception regarding risk associated with Mutual Fund Investments)

Gender * Perceived Risk Crosstabulation					
		Perceived Risk			Total
		Low	Modera te	High	
Male	Count	14	22	28	64
	% within Gender	21.9%	34.4%	43.8%	100.0%
	% within Perceived Risk	60.9%	44.0%	71.8%	57.1%
	% of Total	12.5%	19.6%	25.0%	57.1%
Female	Count	9	28	11	48
	% within Gender	18.8%	58.3%	22.9%	100.0%
	% within Perceived Risk	39.1%	56.0%	28.2%	42.9%
	% of Total	8.0%	25.0%	9.8%	42.9%
Total	Count	23	50	39	112
	% within Gender	20.5%	44.6%	34.8%	100.0%
	% within Perceived Risk	100.0%	100.0%	100.0%	100.0%
	% of Total	20.5%	44.6%	34.8%	100.0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.076[a]	2	.029
Likelihood Ratio	7.189	2	.027
Linear-by-Linear Association	1.599	1	.206
N of Valid Cases	112		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.86 .

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal Phi		.251	.029
Cramer's V		.251	.029
N of Valid Cases		112	

a.   Not assuming the null hypothesis.
b.   Using the asymptotic standard error assuming the null hypothesis.

While studying the association between gender & perception regarding risk

associated with Mutual Fund investments, as indicated in Table 4 above, it was found that majority of female respondents, 58.3%, believed the risk to be of moderate level while most male respondents, 43.8%, believed it to be of a high level. The null hypothesis 'there is no statistically significant association between gender & perception regarding risk associated with Mutual Fund investments' was rejected as p value (0.029) generated by chi square test for goodness of fit was less than alpha (0.05), $\chi^2(2) = 7.076$, $0.029 \leq 0.05$. Cramer's V value of 0.251 indicates moderate association between the two variables.

Table 5: Cross-tabulation, Chi Square Test and Symmetric Measures (Gender & Perception regarding reliable source of information with reference to Mutual Fund Investments)

Gender * Perceive_Reliable_Source_of_Info Crosstabulation						
		Perceived_Reliable_Source_of_Info				Total
		Investment focussed T.V. Programmes	Internet	Friends / Relatives	Sales Reps of AMCs	
Male	Count	5	36	8	15	64
	% within Gender	7.8%	56.2%	12.5%	23.4%	100.0%
	% within Perceive_Reliable_Source_of_Info	50.0%	60.0%	50.0%	57.7%	57.1%
	% of Total	4.5%	32.1%	7.1%	13.4%	57.1%
Female	Count	5	24	8	11	48
	% within Gender	10.4%	50.0%	16.7%	22.9%	100.0%
	% within Perceive_Reliable_Source_of_Info	50.0%	40.0%	50.0%	42.3%	42.9%
	% of Total	4.5%	21.4%	7.1%	9.8%	42.9%
Total	Count	10	60	16	26	112
	% within Gender	8.9%	53.6%	14.3%	23.2%	100.0%
	% within Perceive_Reliable_Source_of_Info	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	8.9%	53.6%	14.3%	23.2%	100.0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.745[a]	3	.863
Likelihood Ratio	.741	3	.864
Linear-by-Linear Association	.001	1	.977
N of Valid Cases	112		
a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.29.			

Symmetric Measures		
	Value	Approx. Sig.
Nominal by Nominal Phi	.082	.863
Cramer's V	.082	.863
N of Valid Cases	112	
a. Not assuming the null hypothesis.		
b. Using the asymptotic standard error assuming the null hypothesis.		

The internet emerged as the favoured choice when asked about the perceived

reliability of sources of information regarding Mutual Fund investments with half the female respondents and 56.2% of the male respondents indicating it as their first choice (Table 5). A p value of .863 when conducting a chi square test indicates that the null hypothesis 'there is no statistically significant association between gender & perception regarding reliable source of information with respect to Mutual Fund investments' was not rejected, $\chi^2(2) = 0.745$, $0.863 \geq 0.05$. Cramer's V value of 0.082 indicates very weak association between the two variables.

Findings

The study indicates that a statistically significant weak association may exist between gender and perception regarding best mutual fund type for investment. This is also evident from the fact that equity funds were perceived as better by males as against 'balanced funds' preferred by females.

Similarly, a statistically significant moderate association exist between gender & perception regarding risk associated with Mutual Fund investments as most male respondents perceived mutual funds to be high risk investments whereas most female respondents considered mutual fund investments as moderate risk ventures. This could also be because most males preferred the riskier equity schemes whereas a majority of females preferred the relatively safer balanced schemes.

Findings indicated an absence of statistically significant association between gender and perception regarding ideal holding period of Mutual Fund investments, perception regarding ideal proportionate investment in Mutual Fund schemes and perception regarding reliable source of information with respect to Mutual Fund investments.

Most respondents, irrespective of gender, preferred to invest 10-25% of their total investment in mutual funds and considered a holding period of 1-3 years as ideal for mutual fund investments. Additionally majority of males and females considered the internet as an appropriate source of information with regard to mutual fund schemes.

Conclusion

The current low penetration levels of mutual funds, especially in households, combined with the recent spurt in investor interest in mutual funds as indicated by recent AMFI data, makes this an interesting industry to keep a close watch on. Players in this industry can conduct similar studies on a larger scale and target potential investors with customised options based on gender.

Also as most respondents indicated the internet as a preferred source of

information for mutual fund investments, companies can design means of improve their offerings and information available on their websites. As most respondents preferred a holding period of 1-3 years companies can on the one hand design compatible products and on the other can also consider ways of increasing awareness regarding benefits of investing in mutual fund schemes with alternate holding periods.

Limitations of the study and scope for further research
There are several limitations to this study. Firstly, the study is limited to 112 respondents drawn from Delhi-NCR which cannot be considered as representative of the population. Secondly, it considers only the association between gender and certain select perceptions regarding mutual fund investments, for instance no data has been collected or analysed regarding association between gender and perception regarding best AMC or rationale of investment.

Thus there is a definite scope for a more comprehensive study using a larger sample size across more cities and towns in India. Furthermore, studies can also focus on association between other demographic factors such as age, income level etc and perception towards mutual funds. This can be taken a step further and a three-way tab test may be applied to see if gender and income level or gender and education level have a statistically significant association with various attributes of perception towards mutual fund investments.

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WannaCry Malware Analysis

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ABSTRACT

In business scenarios today, the most precious asset is computer systems and the data which is stored in them. Attackers are well aware of this fact and that is the reason why they can easily make money by holding this data at ransom. This is the reason why ransomware form of malware is on constant rise and is threatening businesses. WannaCry is one such ransomware which recently caused great havoc in many countries, affecting public amenities like health, in addition to causing huge monetary losses and losses to data. In this paper we will analyze wannacry in detail to understand its architecture, working, damages it caused and how the kill-switch worked to stop the damages for some time. We will also understand the various precautions to be taken to be protected from such ransomware in the future.

Keywords: Ransomware, WannaCry, SMB vulnerability, doublepulsar, bitcoins, TOR.

INTRODUCTION

Friday, May 12, 2017 was the day when about 40 hospitals of National Health Service in UK had to shut down their operations because of a major attack on their computer systems by a ransomware called ' WannaCry'. The entire data in these systems was encrypted and lives of many patients were in danger. Similar was the case of 'FedEx' in US,'Telefonica' in Spain, 'Deutsche Bahn' in Germany and 'Latam Airlines' in South America. Ultimately 150 countries with 2,00,000 computers were attacked by WannaCry and by Monday, some $50,000 were already paid to the attackers by various companies and individuals. However not everyone's data was recovered even after the ransom was paid. The reason for that is, one cannot tie payment to who you are making it to[1]. The malware goes by various names like 'WannaCry', 'WannaCrypt' and 'WannaCryptor'. It is also called 'EternalBlue'. Wannacry exploits a vulnerability in the Service Message (SMB) Block of Microsoft Windows Operating System. After infecting, it encrypts files in the system and renders the system useless unless ransom is paid. It can also spread across network, affecting all computers connected to that network. Microsoft had released a patch earlier itself for this vulnerability. People who failed to patch their system on time were affected. Also, a patch was not released for Windows XP, which has stopped getting support from Microsoft.

LITERATURE REVIEW

Nolen Scaife, Henry Carter[6],introduce a ransomware-warning system which can alert a person for a suspicious file activity using behavioral analytics. Alexandre Gazet [7] compares and categorises various kinds of ransomware. The comparison is based on reverse engineering and finds the business models and the communication associated with these ransomware. Amin Kharraz , William Robertson[8] presents the results of a long-term study of ransomware attacks that have been observed in the wild between 2006 and 2014. Also a holistic view on how ransomware attacks have

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evolved during this period by analyzing 1,359 samples that belong to 15 different ransomware families is being provided.Andronio N.[9]present HelDroid, a fast, efficient and fully automated approach that recognizes known and unknown scareware and ransomware samples from goodware. The approach is based on detecting the "building blocks" that are typically needed to implement a mobile ransomware application.[3] we propose a methodology based on formal methods that is able to detect the ransomware and to identify in the malware's code the instructions that implement the characteristic instructions of the ransomware.

 Our paper explains the working of 'WannaCry' malware in detail. There have been many   papers which talk about ransomware in general and how they are a threat our businesses. However, no paper talks about the technical details of WannaCry specially from a programmer's perspective. Once we know the architecture and the working of WannaCry, we would be able to protect ourselves better from this ransomware and other malwares as well.

**1.   Reasons for WannaCry Spread**:

1.1.   SMB Vulnerability: SMB stand for Service Message Block. It runs as a thin layer on top of TCP protocol. It provides file and printer sharing facilities between different Windows machines. This is done using Inter Process Communication. It can run either directly on TCP(port 445) or using NetBios protocol on UDP ports (137,138) and TCP ports(137,139) or on legacy protocols like NBF and IPX or SPX. It is also called CIFS- Common Internet File System. Another protocol called 'Samba' was created for communication between Windows and non-Windows systems. Samba is an open-source, free reimplementation of SMB for non-windows systems like Unix and Linux. Actually, Windows opens the SMB and the NetBios ports by default for both local and outside access. WannaCry scans for an open SMB port to enter into the system. After that, it spreads just like any other worm[2].   Microsoft had released the second version of SMB called SMB v.2. United States, National Security Agency(NSA) had discovered the SMB vulnerability long time ago. However, instead of reporting it to Microsoft, it created 'EternalBlue'. EternalBlue is an exploit based on this vulnerability. It was built to be used in future as a cyber weapon for NSA. Now, there is a group called 'Shadow Brokers'. This group leaked EternalBlue. After the leak, Microsoft released a patch for this. However, companies and individuals who failed to update, were attacked. Not only was EternalBlue leaked, which was used in WannaCry, but many other NSA exploits like EternalChampion, EternalSynergy, EternalRomance, EmeraldThread and EducatedScholar were also leaked. These can easily be used for much bigger hacks. In fact, The Shadow Brokers have claimed to have many more leaks under their belt waiting to be released.

1.2.   Non-Updation With Microsoft Patch: This security lapse was known earlier this year and Microsoft had released a patch called MS17-010. However the attackers chose Windows XP operating systems because Microsoft had stopped

supporting Windows XP three years ago. Also no patch was released for this operating system. So all systems still using Windows XP or higher versions of unpatched Windows systems were attacked. Therefore Microsoft released an emergency patch over the weekend for Windows XP systems.

2.   Working: Once WannaCry enters the victim computer, it scans heavily for the SMB port vulnerability. If the port is found open, an SMB connection is set up. Then the patch MS17-010 is searched for. If it is not found then an encrypted shellcode is prepared in Base64 encodeing and is heapsprayed in the memory. Once found, the shellcode looks for DoublePulsar. This malware downloader changes permissions to remote access and calls a particular domain to see if it is registered. This is done to find out whether the malware is working in a sandbox or not. If the domain is not registered, SMB exploitation starts getting performed. A file called 'taskche.exe' is created which will carry out file encryption and will also help the malware spread across the network. In the meantime, TOR is used for all communications, bitcoin wallets are loaded, public and encryption key is prepared. The files start getting encrypted. WannaDecryptor.exe is set up and Please_Read_Me.txt file is created. The screen is locked and ransom message is displayed.
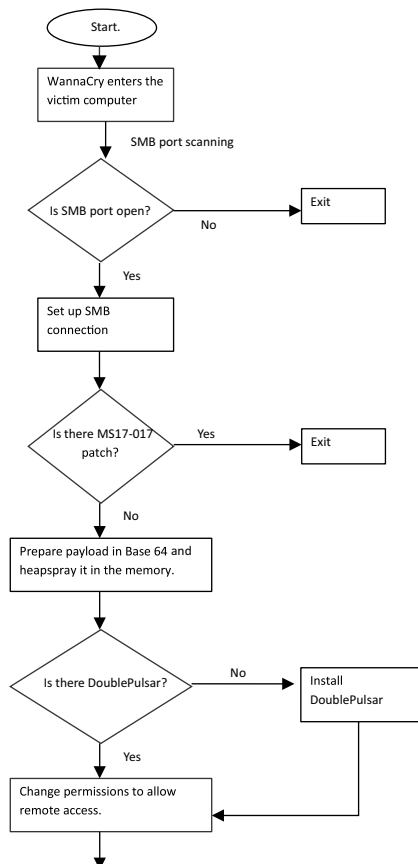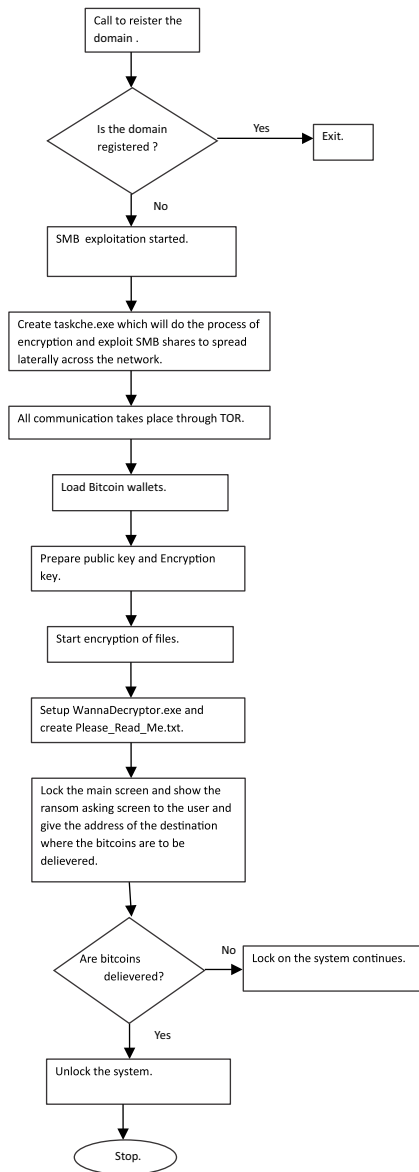
3.   Components of WannaCry:

3.1.   DoublePulsar: DoublePulsar is a malware downloader. Its basic purpose is to download additional malwares into the system. DoublePulsar is normally loaded into the machine before WannaCry and it is running as a background process undetected. WannaCry, after getting loaded, searches for DoublePulsar. After getting permission from WannaCry, DoublePulsar alters user mode process permissions and   sets up remote access. Once connected, DoublePulsar deletes itself. DoublePulsar was originally developed by 'Equation Group' and was leaked by 'The Shadow Brokers' alond with 'EternalBlue' in early 2017 [10]. So it was used with EternalBlue to carry out WannaCry attacks. Also, once a system is rebooted,

kernel payload does not load the actual DLL(Dynamic Link Library). It actually sets up an Asynchronous Procedure Call(APC) to another shellcode that performs the load. Since it does not make a LoadLibrary call, which is a local call, therefore the DLL is not written to the disk. So there is no entry in the Process Entry Block(PEB).Thus, it remains hidden.

3.2.   TOR: TOR stands for 'The Onion Router'. It is a worldwide network of computers, initially developed by the U.S. Navy that helps people to browse the Internet anonymously[4]. TOR hides your identity because it moves your traffic across random TOR servers and encrypts the traffic for many times including the next node address and sends it through a virtual circuit comprising successive, randomly selected TOR relays. Each relay decrypts a layer of encryption to reveal only the next relay in the circuit.

3.3.   Domain Check: Just a few days after WannaCry was launched, a man who goes by the name @MalwareTech, discovered a Kill Switch to stop the attack. This slowed down the destruction by the malware to a large extent. Actually, before WannaCry starts the SMB exploitation, it tries to connect to a domain addressed, 'https://www.iuqerfsodp9ifjhgosurijfaewrwergwea.com'.If the machine fails in making the connection, the exploitation continues. However, if the connection is successful, the exploitation is stopped immediately. Actually, this is a way of 'Sandbox Evasion' technique. Whenever a malware attacks a machine, it ensures it is not running in a sandbox. A sandbox is a way employed by Antiviruses and IDPS systems. In this, any suspected program runs in a protected, siloed environment, detached from the main operating system with limited resources. If any permissions for connections are asked for, example in this case, the malware asked for permission to connect to a domain, the permission is granted. This is to trick the malware into assuming that it is running in an actual environment and not in a sandbox. Therefore, the registration of this domain acted as a kill switch for Wannacry.

3.4.   Bitcoin Wallets: Bitcoin is cryptocurrency and a digital payment system invented by a programmer called 'Satoshi Nakamoto'. It is an open software and was released in 2009. Wannacry asks it's victims to pay in bitcoins for getting the decryption key. Before that, Bitcoin wallets are created in your system. It is a peer-to-peer system which takes place between users directly without an intermediate person. The transactions are recorded and verified in a public distributed ledger called 'Blockchain'. Bitcoin is thus a decentralized digital currency.

4. Precautions to be taken: After the huge destruction caused by WannaCry, some precautionary steps can be taken to prevent such an outbreak in the future[5]. First of all, any ports which are not required to be open at all times must be closed and opened only when that service is requested for. Second, one must keep all her systems, completely updated using patches whenever they arrive. Regular

updation is likely to protect your systems from many vulnerabilities and malwares. Third, network segmentation plays a key role in preventing an infection to spread across other systems in the network thus protecting other systems and also containing the infection. Preventive actions like not clicking on suspicious files in your mails and protecting your system's user id and password are anyday, very important. Lastly any individual or organization which finds a vulnerability must make it public for larger interest of the society and not hoard it for creation of cyber warfare.

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HARVEST THE DEEP WEB

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ABSTRACT

The term "deepweb" is used to denote a class of content on the Internet which, for different technical reasons, is not indexed by search engines. Among the different strategies in place to bypass search engine crawlers, the most efficient for malicious actors are so-called "darknets." Darknets refer to a class of networks that aim to guarantee anonymous and untraceable access to Web content and anonymity for a site. While deepweb has often been uniquely associated with The Onion Router (TOR), in this paper, we introduce several other networks that guarantee anonymous and untraceable access— the most renowned darknets (i.e., TOR, I2P, and Freenet) and alternative top-level domains (TLDs), also called "rogue TLDs." We analyzed how malicious actors use these networks to exchange goods and examined the marketplaces available in the deepweb, along with the goods offered. Due to a large variety of goods available in these marketplaces, we focused on those that sparked the most interest from cybercriminals and compared their prices with the same class
of merchandise found in traditional Internet underground forums, mostly Russian. Finally, we introduced some of the techniques that researchers can use to more proactively monitor these so-called hidden parts of the Internet

Keywords: *Deep Web, I2P, TOR, TLDs*

INTRODUCTION

The Deep Web refers to any Internet content that, for various reasons, can't be or isn't indexed by search engines like Google. This definition thus includes dynamic web pages, blocked sites, unlinked sites, private sites (like those that require login credentials), non HTML/-contextual/-scripted content and limited-access networks.

The deep web, invisible web, or hidden web are parts of the World Wide Web whose contents are not indexed by standard search engines for any reason. The opposite term to the deep web is the surface web. The deep web includes many very common uses such as web mail, online banking but also paid for services with a pay wall such as video on demand, and many more. Computer scientist Mike Bergman is credited with coining the term *deep web* in 2000 as a search indexing term.

The reason it exists is because the Internet has become so dependent upon search engines, and search engines are only as good as the web crawlers that serve up content for the results. Some researchers believe that the searchable web is barely 1% of what's actually available on the World Wide Web.

Crawlers are excellent at crawling through static web pages, extracting information on those pages, and providing that information in the form of search results. However, there is valuable information tucked away below the surface of those search results – information buried inside online databases and dynamically generated pages that the search spiders are capable of crawling. Dark net and deep web are used interchangeably but they are not the same. Dark Web is not the Deep Web; it's only part of the Deep Web. The Dark Web relies on darknets or networks where connections are made between trusted peers. Examples of Dark Web systems include TOR, Freenet, or the Invisible Internet Project (I2P).

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The Dark Web is much smaller than the Deep Web, and it's made up of all different kinds of sites. But it's perhaps most popular for its anonymous marketplaces that often sell illegal products like drugs or weapons.

1. What is DeepWeb?

There are many words to describe the deep web, including the invisible web, hidden web, and even Deepnet.

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Just a few examples of those tremendous databases include information like patents, census data, data collected on space missions, climate data and academic databases filled with scientific papers overflowing with interesting and valuable information.

All of this doesn't even include the deepest and darkest corner of the Internet where secretive onion websites exist, accessible only through special Tor software. A basic layout of what this looks like is shown below.

2. DEEP WEB - Evolution

Earlier all the information were stored in plain html pages which are static, and typical web crawler could easily cover the entire information.

However, in the mid 90s dynamic pages were introduced to cope up with the enormous increase in data. Information were being stored in databases which return results for as query. Such dynamically generated pages were beyond the coverage of traditional crawlers.In 1994, Jill Ell worth termed this un-reachable web as "invisible-web"

In 2001, Bergman in his study renamed it as "Deep Web" and proposed Bright Planet technology which is capable of finding deep web contents.

3. Deep Web parts Access Methods

Methods of accessing these different parts of the deep web are determined by the data that you want to get at. The tools used to navigate the deep web are outlined here.

- Databases – Information about people, census data, climate data, world information and other searchable information that could be stored in a table format.
- Journals and Books – Information contained in a digital format that is either stored in a format not accessible by web crawlers or exists behind a paid gateway. These files need to be downloaded and opened on a PC.

- • Tor Network – Sites that want to remain hidden, and typically include things like illegal porn, stolen personal data, drug contacts, anonymous political dissidents, terrorists, and more.

This manual will take you on a tour through the many levels of the deep web, starting with the databases where you can find information only accessible to those who know the secrets to accessing them. Then, we'll continue on to the spectrum of information available in academic journals and books where you can browse through volumes of writings about scholarly topics. Finally, we'll arrive at the gates of Tor, beyond which lies the deep darkness of the entire Internet.

4. Deep Web Technologies

You can't just access the deep web from a normal web browser – like Firefox for example – you can only access the deep web through a deep web browser. The most famous of these deep web browsers is called Tor. Other darknets include freenet, I2P etc.

- • *TOR*
  (The Onion Router)
  The TOR network was originally developed by the U.S. Naval Research Laboratory and first introduced in 2002. It's a secure network that uses onion routing to keep all of your activity as encrypted and hidden as possible. Onion routing is implemented by encryption in the application layer of a communication protocol stack, nested like the layers of anonion. Tor network designated a special-use top level domain suffix ".onion
  " for anonymous hidden services.
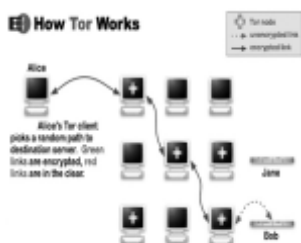
- • **I2P**
  The Invisible Internet Project (I2P) is a decentralized anonymizing network built using Java on similar principles to Tor, but which was designed from the ground up as a self-contained darknet. As with Tor, users connect to each other using peer-to-peer encrypted tunnels. Unlike Tor Onion routing, I2P uses Garlic routing, which encrypts multiple messages together to make it more difficult for attackers. The end result is that if using hidden services, I2P is both much faster than using Tor (it was designed with P2P downloading in mind), more secure, and more robust.

- **FreeNet**

    One of the older and most highly regarded systems, FreeNet combines deep web with DarkNet. This means that you can maintain a list of trusted peers and either connect to them only, or connect to them in preference to less trusted peers. This gives the highest level of privacy and security of any system, but does require a little more effort to make the most of.

- **ZeroNet**

    Based on torrent technology in combination with Bitcoin encryption, this is a new system which is not well developed but which I think holds promise for the future.

5.   Deep Web Search Engine

Okay, so you know the basic concept of a search engine. Type a word or phrase into a search box and click a button. Wait a few seconds, and references to thousands (or hundreds of thousands) of pages will appear. Then all you have to do is click through those pages to find what you want. But what exactly is a search engine, beyond this general concept of "seek and ye shall find"? It's a little complicated. On the back end, a search engine is a piece of software that uses applications to collect information about web pages. The information collected is usually key words or phrases that are possible indicators of what is contained on the web page as a whole, the URL of the page, the code that makes up the page, and links into and out of the page. That information is then indexed and stored in a database.

On the front end, the software has a user interface where users enter a search term — a word or phrase — in an attempt to find specific information. When the user clicks a search button, an algorithm then examines the information stored in the back-end database and retrieves links to web pages that appear to match the search term the user entered.

A search engine is designed to perform several tasks. First, it collects the information contained in the pages of the web.("crawling" in the jargon). Next all this information stored , compressed and processed to build content indexes. Finally comes the interaction with the user. When a user types a query the engine must find in the indexes the pages that contains relevant information and must show this outcome as an ordered list. computing an application that searches for, and retrieves, data based on some criteria, especially one that searches the Internet for documents containing specified words. They index millions of sites on the Web, so that Web surfers like you and me can easily find Web sites with the information we want. By creating indexes, or large databases of Web sites (based on titles, keywords, and the text in the pages), search engines can locate relevant Web sites when users enter search terms or phrases.

Existing in a variety of types, all search engines procure information but organize it in a variety of unique ways, which is why there are so many different search engines.

At a basic level, a search engine is one of two things: a Robot or a Directory. Though some search engines combine features of both, most are predominantly either Robots or Directories. A Robot uses a software program to search, catalog, and then organize information on the Internet. Organization of data can be completed in a number of ways—including through a harvester, robot, spider, wanderer, and worm—and employing diverse ways of searching Websites to gather data.

Directory search engines do not search on the Internet for information but rather obtain it from individuals who enter it into the search engine's database. Because each Directory has its own means to categorize information, multitudes of them exist

6. Conclusion

Serious information seekers can no longer avoid the importance or quality of deep Web information. But deep Web information is only a component of total information available. Searching must evolve to encompass the complete Web.

Directed query technology is the only means to integrate deep and surface Web information. The information retrieval answer has to involve both "mega" searching of appropriate deep Web sites and "meta"searching of surface Web search engines to overcome their coverage problem. Client-side tools are not universally acceptable because of the need to download the tool and issue effective queries to it. Pre-assembled storehouses for selected content are also possible, but will not be satisfactory for all information requests and needs. Specific vertical market services are already evolving to partially address these challenges. These will likely need to be supplemented with a persistent query system customizable by the user that would set the queries, search sites, filters, and schedules for repeated queries.

These observations suggest a splitting within the Internet information search market: search directories that offer hand-picked information chosen from the surface Web to meet popular search needs; search engines for more robust surface-level searches; and server-side content-aggregation vertical "infohubs" for deep Web information to provide answers where comprehensiveness and quality are imperative.

7. Future scope

Deep web also has plentiful information contained in it. It is a repository of very useful contents that are important for researchers at many levels. To use these resources, there is need of an efficient method to get the relevant and desired content which is lying beneath the surface web i.e. deep web. Although some very useful algorithms and software are designed to explore the hidden web, yet there is much scope of finding new methods of crawling the so called deep web that can be cost and time effective. In future, we will focus on the deep web crawling techniques, merits and demerits.

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On Road Obstacle Detection : A Review

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ABSTRACT

On Road Obstacles detection from moving camera is also come under object detection. Road obstacles are a source of serious accidents that have a simple influence on driver safety, traffic flow efficiency and damage of the vehicle. The obstacle detection technologies are increasingly popular choices for driver assistant system. Obstacles detection is essential to avoid such kind of the accidents. Determining obstacles is very difficult and also it becomes complicated because of various problems like existence of shadow, environmental variations or an unexpected act of any moving things (e.g., car overtaking, animal coming) and many others with stationary camera. A new process is presented for detecting obstacles from moving camera and moving objects which overcomes numerous limitations above stationary cameras and moving/stationary objects. Further, paper analyses latest research developments to spot obstacles for moving cameras and moving objects with discussion of key points and limitations of each approach. Given the importance of obstacle detection, the main measure of interest was to decrease the road accidents and driver's safety. Detection of obstacles with moving camera and moving objects is more robust and reliable than stationary cameras.

Keywords: Obstacle Detection, Intelligent Transportation System, Driver Safety.

1. INTRODUCTION

With the amassed numbers of obstacles on the road there is necessity to develop a system which offers evidence of Obstacles to the driving assistant system in moving vehicles. Moving Obstacles detection is also the object detection. It is an important structure for driver assistant system. A number of researcher's attempts to take the problems associated to object detection and make the system capable to find out or detects moving and stable obstacles .The obstacle detection tools are increasingly corporate choices for driver assistant system. The occurrence of death by road accidents becomes significantly serious issue in every country. A number of literature review have observed that the effect of obstacles on driver's safety. While driving on the road, the driver must be interacting with GPS (Global Positioning System) system regularly. The distraction of the driver may cause a serious accident if there is any obstacle that he has to consider. The present Process of Obstacle Detection with Moving Camera is designed to extra investigate the impact of this system on driver's safety and performance.. Though, in spite of massive literature review, actions of most of the algorithms still fall far behind human perception. In this literature, the study is depend upon different the existing methods for detecting moving objects and obstacles for Intelligent Transportation System .However, despite the vast literature, most of the algorithms still fall far behind human perception. Importance of obstacle detection, the main measure of interest was to decrease the road accidents and driver's safety.

The existing below process is considered to improvement study the effect of existing system on driver's safety and performance.

In the proposed approach, there will amount of serious attentions. The approaches best where camera will be mounted in moving vehicle. However with the help of moving camera finding obstacles. In real time will best result for driver assistant system .Given the significance of obstacle detection, the key amount of attention be there to fall in road accidents and driver's safety.

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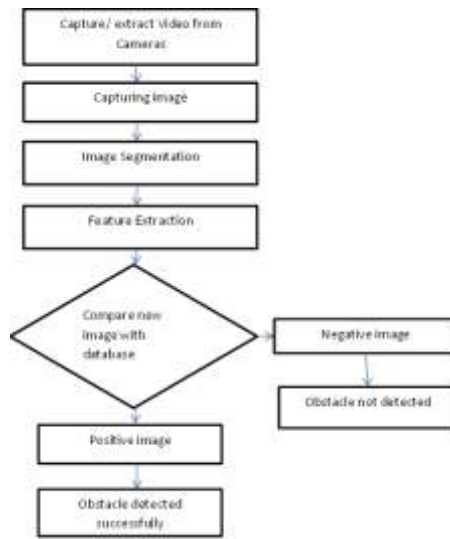[2]Ph.D. Guide Department of Computer Science, TMV University, Pune, anupgirdhar@gmail.com

Figure 1. Process of Obstacle Detection with Moving Camera

The proposed process looks to detect the obstacle coming in the route of the vehicle, though the vehicle moved. The goal of the process is to spot the obstacle, hence the driver be notified and specific attentions will be taken to prevent accidents. Complete process of Obstacle Detection with Moving Camera goals to the safety from accident. The below description shows that how the above process works, what kind of actions are achieved and in what way the outcome is obtained. The description of process of obstacle detection is below:

- The camera is mounted in the vehicle, thus the camera is moved as the vehicle moved.
- The on road obstacle is spotted by the system.
- The system wants many positive images of obstacle as well as some negative images of obstacles for comparison purpose and so, the system essential previous information about the kind of obstacle.
- Positive image= Image, that contains the obstacle. Obstacle detected successfully
- Negative image= Image, that does not contain the obstacle (The image with no object) or the shadow.

2. LITERATURE REVIEW

A number of researcher studies have examined that the impact of obstacles on driver's safety. We are defining the present approaches for spotting moving objects and obstacles for driver assistant system of Intelligent Transportation System.

Wang et al. [1] in this paper they defined moving object detection technique created on temporal information. It workings largely in three phases. 1. Motion saliency generation: In constant frames by symmetric variance produces a temporal saliency map. 2. Consideration seed selection: By maximum entropy sum method computes the threshold to get max saliency in candidate area. Using the proposed method, repeated objects cannot be recognized.

L.W. Tsai, J.-W. Hsieh and K.-C Fan offered a method for detecting moving vehicles using

two parameters (colour and edges) from static images. This suggested method produces a new transform model for discovery out vehicle candidate associated to their colours in several environments but in traffic jams or overlying of multiple vehicles conditions it does not able to detect vehicle candidates[2].

Zhang et al. [3] created method for a multilevel framework to identify and handle vehicle occlusion. The suggested framework collected of three levels which are as intraframe, interframe, and tracking levels to determination of occluded vehicles. In first level i:e intraframe level it assesses the compactness ratio and internal distance ratio of vehicles, in interframe level, Implements the subtractive clustering on the motion vectors of vehicles, and the occluded vehicles are disconnected allowing to the binary classification of motion vectors. In tracking level occluded vehicles are tracked by using a bidirectional occlusion reasoning mechanism. Bhaskar et al. [4] suggested an image processing based vehicle detection and tracking method. The traffic data will robotically extract from this method. Foreground can be distinguished from the background with two methods. In the first process the Gaussian mixture model is used to spot background of the frame and in the second process the Blob detection is used to trace the movement of an object from frames. Using foreground detector detection of the object is completed over binary computations and every object is detected by describing a rectangular region at each object. To remove noise the operations, i.e., Morphological processes are determined on the outcome. When there is extremely defended traffic system the calculation time will be increased.

Xia Dong et al. [5] the process created on RGB color space and edge ration is used to identify the shadow with moving objects. They showed that a pixel that can be categorized in one of the three forms: either an object, background or a shadow through experiments. Furthermost of the approaches apply to steady cameras only.

Liu Gang et al. [6] proposed moving object detection algorithm by assured enhancement. The variance of two continuous frames (images) is computed for spotting the moving object. Also, three-frame distinction method subtracts frame pairs from three frame images. Detection of the edge of the image is completed by Image edge detection. The dilation process can be used for joining all the points of background into connection with the object in the object. It is not appropriate when the atmosphere contains strong light. So it is not appropriate for all kinds of environment.

Hassannejad et al. [7] offered a scheme for discovery of moving objects based on a monocular system in roundabouts. Firstly, object detection, arrangement of image, and video stabilization and arrangement of images is Feature matching. Feature matches are decided later feature and the descriptors are actuality extracted from many images. The pair of features matches is mined. The algorithm that is used is AdaBoost aimed at pattern recognizing by sliding window. There are mostly three stages putting into practice:

1. Feature detection: In this stage, with a baseline algorithm the feature of the image that is moving is recognized.

2. Clustering: On every single feature object was spotted.

3. Pattern recognition: Though, it is problematic to spot object's moving features; so by means of this all traceable patterns are spotted.

4. Restriction of speed: This is not functional roundabouts for high speed at. Furthermore, the shadow is also considered as object further down the vehicles.

Choi et al. [8] when there is a fast illumination changes this robust moving object detection technique is used. Two methods are used to identify the effect of illumination change. 1) CDM: Chromaticity Difference Model and 2) BRM: Brightness Ratio. Both approaches are

used to detect areas like dark background that is shaded road or sunny background that is Illumination of sunlight. In CDM process it checks in dissimilar frames for illumination change. If there is no illumination alteration, then that pixels are considered as foreground pixels. And left behind pixels are supposed to false foreground pixel. In BRM method, it is only used regulator false foreground pixels. But it can be realistic to only certain incomplete illumination alteration. It will not work well when brightness alteration of the full scheme.

Cristina et al. [14] vehicles that are travelling in opposite lane are took as audio-visual and STS system agree to vehicle who needs to overtake. So this is considered to recover driver's visibility, safety and go beyond decision. It is executed by two systems; a accurate driving simulator and DSRC. STS system is considered in the method that when this is a traffic sign of 'no overtaking' it will mechanically deactivated. After overtaking the vehicle will directs video streaming this was proceeding to end it. The judgment postponed in communication will be the smallest as vehicles are in straight communication. For better communication, the both vehicles must be in direct communication, as a vehicle in forward-facing is full in area of vision and is near. OpenSceneGraph is used to describe the placement and angle of sight.

Huijuan Zhang et al. [11] proposed algorithm founded on dynamic scenes for moving target detection. Aimed at that video essential be pre-processed. The shadow and certain background region develop a bottleneck for results, so that the frame produces false result in line for match colors. For improved result in this condition need be prohibited. So we can use the relation of length-width for the rectangular region as certain result can have a rectangular counter model. The main disadvantage of this scheme is that it is not probable to detect flutter noise removal and discovery of multi moving objects.

Jinhai Xiang et al.[12] under altering illumination condition, this one proposed a method for moving object detection and shadow removing. By means of Gaussian mixture model the foreground is identified. The process is used to define and distinguish between foreground objects and the background object. The shadow can be removed from spotting object by contour of moving objects. But this process is restricted to the small size of the object. If the object is big sized then and there it won't work for expectations.

Toth et al. [15] provides clue taking place image processing in VANET. By means of demand or exact query the object which remained mandatory will be spotted robotically from image. The response can remain of three kinds: term condition, model, and request. Aimed that the query will stay produced either by means of an application system in which object is concerned or by means of person. Afterward, the query resolve be directed to further vehicles. The process of image processing is applied to the sequence of video or current image taken from the camera. The image processing functions are used for detecting objects like GETIMAGE, FINDIMAGE, QUERYINFO, spatial operation and set operations.

JiuYueHao et al. [17] proposed spatio-temporal traffic scene, planned for moving object motion detection. The Spatio - temporal model is founded on KDE used aimed at dynamic background handling. KDE is used to identify moving foreground object. The Gaussian foreground model is used for the spatial correlation of the foreground pixel. The calculation of time is too reduced. The procedure, named frame fusion is used aimed for robust updating stage.

A. P. Shukla et al. [28] usages three methods aimed for segmentation and tracking moving object of vehicle detection. Three procedures are: Background Subtraction method; Feature Based Method and Frame Differencing and Motion Based method. The background subtraction process is used to mine moving foreground objects from image storing background or by means of image series having background. The frame modification

process is used toward to deduct two continuous image frames aimed at detecting the target moving object from the frame image containing background. Region-based tracking technique is intended for the moving objects to track the area. The vehicle boundaries stay traced in Contour tracking approaches.

Dipali Shahare et al. [18] overwhelmed the restriction of static cameras. It presents moving object detection with fixed camera as well as the moving camera aimed automated video analysis. The feature opinions are mined as of current frame by means of optical flow method. An enhanced Expectation-Maximization (EM) procedure is used in consecutive frame subtraction. The procedure founded on the calculation that changes of neighbouring frames and then and there moving area and background are predictable. In background subtraction technique the assessment between each response image frame and the background model found from the earlier image frames. That manner, the foreground frame and background frame can be obtained. However, it is not vigorous in contradiction of illumination changes. It cannot detect shadow by a moving object.

3. CONCLUSIONS

This paper shows the review of previously used method for object detection with stationary camera. .After review of object detection with stationary camera we come up with detection of obstacles from moving camera and moving objects which overcomes a number of restrictions above stationary cameras and moving/stationary objects. Moving Obstacle Detection Process for the aim to prevent accidents, and is a step to make the driving fully automated for driver assistant system in Intelligent Transport System. There is still space for improvement in the system. This paper comes up with moving obstacles detection with moving camera the number of obstacles to be detected. It was observed here that a major limitation with most documented image processing techniques is the absence of environmental factors such as time of the day, rainfall, cloud cover etc., in the detection design process. Thus the process of obstacle detection for moving camera had proposed in this, after reviewing related paper of object detection and keeping the drawback of reviewed methods. Future work will be practical implementation of this process of moving obstacle detection for moving camera.

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Requirements Engineering Techniques for Data Warehouse using Information Packaging Methodology

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ABSTRACT

A requirement is a feature of the system or a description of something the system is capable of doing in order to fulfill the system's purpose. Building a data warehouse is a very challenging task. Most of the data ware house project fails to meet the business requirements and business goals because of the improper requirement engineering phase. The Requirement Engineering (RE) is the most important phase of the software development life cycle (SDLC). This phase results into a large document written in natural language that converts the incomplete, imprecise requirements and wishes of the potential users into complete, precise and formal specifications. This formal specification is known as SRS i.e. Software Requirement Specification. These Requirements are transformed into information package in the form of dimensions, hierarchies and facts to build a data warehouse. Hospital can be seen as an example of a complex system. This paper considers Hospital as a case study for which a software system has been developed taking the mentioned approach into account. In this paper we study information package for Hospital Automation System.

Keywords: Requirement Engineering, Software Requirement Specification, Software Development Life Cycle, Data Warehouse

INTRODUCTION

Requirements engineering is one of the most important part of software engineering. Requirements engineering is the disciplined application of proven principles, methods, tools and notations to describe a proposed system's intended behavior and its associated constraints. Requirements Engineering is a step of software engineering, which focuses mainly on the designing of the system that users want. Perhaps the most concise summary comes from Barry Boehm: requirements are "designing the right thing" as opposed to software engineering "designing the thingright" (Boehm, 1981)."Software requirements engineering (RE) is the process of discovering that purpose, by identifying stakeholders and their needs, and documenting these in a form that is amenable to analysis, communication, and subsequent implementation". This Phase plays a very significant role in software engineering to develop effective software and in reducing software errors at the early stage of software Development. Hence software developments and maintenance cost will be less moreover customer will get their desired system. There are four Phases of Requirement Engineering:-

- Requirement Elicitation
- Requirement Analysis
- Requirement Documentation
- Requirement Review

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Requirement Elicitation is also known as gathering of requirements from the customer. It is the first step of requirement engineering. It is the most difficult and critical aspect of software development, as the real requirements resides in the mind of the customer. It is basically a meeting between the customer and the Stakeholder. It is the activity that helps to understand the

actual need of the customer. There are various elicitation techniques which can be used to gather the requirements of the customer like Interviews, Brainstorming session, Facilitated Application Specification Technique (FAST), Quality Function deployment (QFD), Questionnaire etc.In the phase of defining requirements we need to concentrate on what information the users need not on how we are going to provide the required information. In past the operational systems such as order processing, inventory control were not intended to provide strategic information as they were designed to provide transactional information. The traditional methods applicable to operational systems are not adequate to gather requirements. Several attempts made by IT department failed to provide strategic information from operational systems. In challenging times good decision-making becomes critical. The best decisions depend upon the availability of proper strategic information in the enterprise. The possible source for that data is a well-designed data warehouse. Data Warehouse (DW) systems are used by decision makers to analyze. A Data Warehouse is a subject oriented, integrated, non-volatile and time-variant collection of data in support of management's decisions.

Business Dimensions for designing Data Warehouse

The new methodology for determining requirements for a data warehouse system is based on business dimensions. A dimension is a structure that categorizes facts and measures in order to enable users to answer business queries. Examples of Commonly used dimensions are region, products and time. Business dimensions form the basis of new methodology for requirements definition. It flows out of the
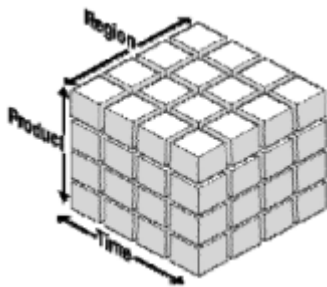
requirements of the user to decide the base for the analysis of business dimensions. It comes up with the measurement and the relevant dimension that must be captured and stored in data warehouse. The users tend to think in terms of business dimensions and analyze measurements along such business dimensions. It forms the basis for gathering requirements. The business dimensions and their hierarchal levels form the basis for development of all phases.

Fig 1: Shows the analysis of three business dimensions Region, Product and Time
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Information Packaging Methodology

Today most of the data warehouses are working with dimensional data. Business data is dimensional in nature. Business dimension comes up with a new concept known as Information Package. The information modeling comprises techniques that help in understanding how to model and package this dimensional business data for data warehouse dimensions, because it focuses on the multi dimensional nature of business data. Information packages define common subject areas and key business metrics. It also decides how the data must be presented by determining the frequency for data refreshing. For example, if you were a sales manager for Automobile products you must analyze sales according to following business dimensions customer demographics, product and time. It breaks out the information package, often referred to as a data cube, for the following business dimensions:

- The Time dimension, which is calculated in the month of December.
- The Product dimension, which is calculated on the basis of automobile products.
- The Customer demographics dimension, which is calculated for customer age.
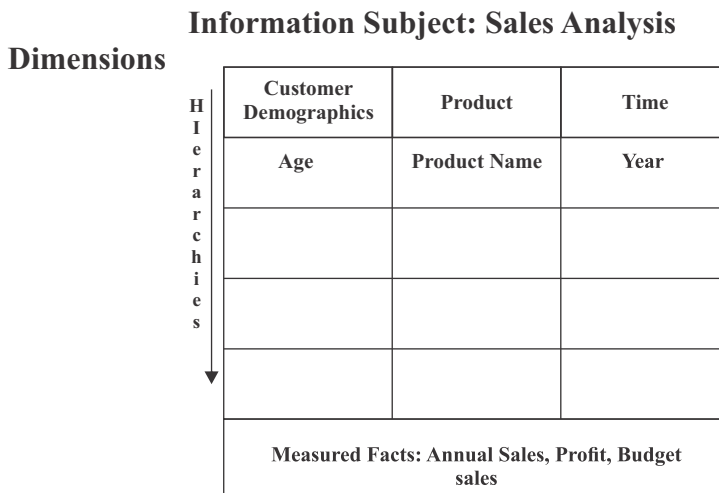
Information Subject: Sales Analysis

Dimensions

	Customer Demographics	Product	Time
	Age	Product Name	Year
Measured Facts: Annual Sales, Profit, Budget sales			

(Hierarchies — vertical label on left axis)

Fig 2: An Information Package

Levels of Refinement

The information packaging methodology focuses on several different levels or cuts of the information models that are derived during the process of building a data warehousing system. Each level is essentially a refinement or more detailed

version of the previously developed data model. It is basically recognized as the necessary foundation for building a database that is well-documented and that fully satisfies user requirements.
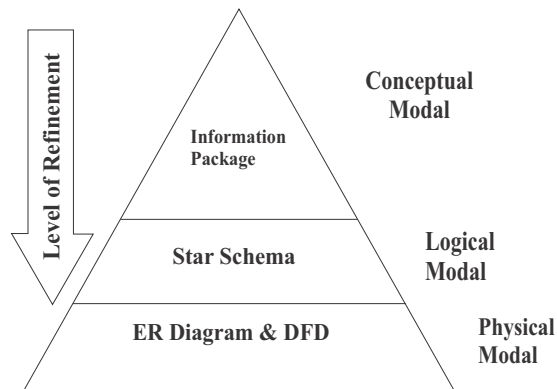

Fig 3: Levels of Refinement

Project team builds in quality and subject oriented data warehouses as needed by user through multiple levels of detail during the design of a data warehousing system. The **conceptual design** relies on a graphical notation that facilitates writing understanding, and managing conceptual schema by both designers and business users. It involves the design of Information package for the data warehouse on the basis of user requirement. The **logical design** ensures that all business requirements, definitions, and rules are supported. This level incorporates the creation of Star schema as the next level. The star schema separates business process data into facts, which hold the measurable, quantitative data about a business, and dimensions which are descriptive attributes related to fact data. The **physical design** ensures optimal performance in the planning of Entities, relationships, data types, and properties. It involves the designing of Entity Relationship diagrams and Data Flow Diagrams. **Problem Statement of Case Study** Today Hospital is the need of every individual for all age groups in the society. To overcome medical needs of the person Hospitals have the required Infrastructure, treatments and various health care facilities. In past days, manual system is used which lack information retrieval, lacks immediate information storage, Error prone calculations, preparation of accurate reports. So, there is the need to automate the Hospital system to handle these problems in more efficient manner. The **hospital automation system** is designed in such a way that it covers all the basic needs and handles patient department, doctor department, outpatient department, doctor's appointment details, operation theater details, billing details, Pharmacy details, patient information details and all other departments. It provides better result to a present hospital. Using the hospital Automation system consumes less time, provides quick and accurate result and ignores manual work. It also

provides proper coordination with the entire system and quick decision making. Figure 4 illustrates the problem area of Hospital Automation System. The possible dimensions for record keeping process of this system are patients' profile, doctor's profile, medicine, time, payment method, ward and bill. Hierarchies and categories are included in the information package for each possible dimension. We summarize the hierarchies and categories for each dimension as follows:

Patient's Profile: Patient_ID, Name, Age, Gender, Address, Contact no., Case history, Disease, Doctor_Name Doctor's Profile: Doctor_ID, Name, Age, Gender, Address, Contact no., Specialisation, Type_of_Appointment Medicine: Name, Composition, Brand, Year of manufacture, Year of Expiry, Price Time: Year, Quarter, Month, Date, Day of week, Day of month Payment Method: Finance Type, Term (Months), Interest Rate, Agent Bill: Date, Time, Amount, Mode of Payment,Patient_Name Ward: Room_Type, No_of_beds, Price

Information Package : Hospital Automation System Dimensions

Patient's Profile	Doctor's Profile	Medicine	Time	Payment	Bill	Ward
ID	ID	Name	Year	Finance Type	Date	RoomType
Name	Name	Composition	Quarter	Term (Months)	Time	No_of_beds
Age	Age	Brand	Month	Interest Rate	Amount	Price
Gender	Gender	Year of manufacture	Date	Agent	Mode_of_payement nt	
Address	Address	Year of expiry	Day of week		Patient_name	
ContactNo.	Contact No.	Price	Day of month			
Case_history	Specialization					
Disease	Type_of appointment					

(Hierarchies — indicated vertically along the left side)

Facts: Annual Revenue, No. of Patients visited, Occupied Rooms, vacant Rooms, Unavailable Rooms

Fig 4: Information Package: Hospital Automation System

Future Scope – Analysis of Hospital data using SPSS

This paper has scope for further improvement. In future we can analyse the data using SPSS Software. SPSS Statistics is a tool used for analysis. These products are used for survey authoring and deployment, data mining, analytics, collaboration and deployment. SPSS stands for Statistical Package for the Social Sciences. SPSS Statistics is software for managing data and calculating a wide variety of statistics. It is used by market researchers, health researchers, survey companies, government, education researchers, marketing organizations, data miners and others. The many features of SPSS Statistics are accessed by pull-down menus or can be programmed with a 4GL command syntax language. Command syntax programming has the benefits of reproducibility, simplifying repetitive tasks, and handling complex data manipulations and analyses. We can take any two attributes i.e. Patients case history and disease to find Covariance, Correlation, chi square test ($x2$) to compare the attributes. Comparison of attributes shows the type of relationship between them i.e positive or negative relation.

CONCLUSION

Through our research, analysis, and design, we transform requirements into an information package for data warehouse, and finally produce an automation system. These techniques are important and will assist in better information packages—a requirement for the architects and designers of a data warehouse. This concept of the information packaging methodology will build the required data architecture and functionality for your data warehouse. This paper helps us to analyse hospital data in the form of dimensions, hierarchies and measurable facts.

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