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SYNERGY

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EDITORIAL

It gives me immense pleasure to bring before you Synergy-I.T.S Journal of IT and Management, Vol 18. No.1.

This issue of the Journal furthers our tradition & commitment to bring together a variety of papers from diverse disciplines, capturing insights of consumer behaviour from private vs national label to two wheelers, detailed study of e-commerce industry to food supply chain management, understanding intelligence through Bhagwad Gita to investigation of Mobile security problems.

Dr Hanuman Sharma's study focused upon the present and future position of private labels in the market and ensuing challenges to national labels. Dr Prashant Sharma and Dr Ajay Sharma reflected upon the factors affecting consumer behaviour while purchasing a two wheeler . Dr Vibha Singh carried out an extensive study on food supply chain management to highlight various dimensions and limitations through case studies. Sunil Kr Vishwakarma and Dr Smriti Asthana conducted research on last mile delivery problems from the perspective of customers in India under the background of growing popularity of online buying behaviour. Dr Rajendra Kumar elaborated on supremacy of human intelligence in the era of artificial intelligence with the glimpse of Bhagwad Gita quotes. Shrey Bhardwaj and Anil Bhardwaj discussed about the security issues with smartphones & mobiles and safety measures to overcome those issues.

As it is evident, the contributed papers delve into multiple aspects of management in different spheres of business and intellectual pursuits offering new perspectives and strategies to engage the reader and spur innovative thinking.

At Synergy, it has always been our endeavor to provide a framework for the furtherance of research into different aspects of Management and Information Technology. It is hoped that the present issue shall continue the tradition of aggregating path breaking research ideas from such diligent minds.

Editor-Synergy

Consumer's Choice to Private Labels vs. National Brands

A Case Study in Gurugram, Haryana

Prof (Dr) Hanuman Sharma

Abstract:

National brands are popular brands of manufacturers and generally dominate market scenario, where the organized retail and private labels are rapidly gaining share at the cost of manufacture brands. Since the retail sector is growing at a very fast pace, national brand manufactures will have to contend with competition within distribution channel- which needs revised marketing strategies, locally and with private labels- to thwart the challenges/threats of private labels in retail stores. With economic slowdown & crises, poverty, and drop in living standards, the consumers had become more sensitive to prices without jeopardy the quality to a certain extent, hence, prefer the private labels. Retailers have felt the mounting demand, hence, invested and earned remarkable profits with private labels. This paper strives to reveal the present and future of private labels and ensuing challenges to national labels.

Key words: National Brands, Private Labels, Retail Industry, Retail Strategies, Retail Brand Development, Private Label Strategy, E-commerce

Background and Introduction:

Consumers consider a large number of brands/labels to meet their needs. Private labels (PLs) first came on scene in the US, Europe and in India about two decades ago. Initially, PLs did not bear the name of retailer but simply 'generic' name like 'milk' or 'butter'. In 1969, Schurttle observed, "Products owned and branded by the organizations whose primary objective is distribution rather than production"; means 'Private Label' products encompass all merchandize sold under a retailer's brand, could be retailers' own name or a name created exclusively by the retailer. White Label – when retailer take someone else's product and put his name on it (selling a product that is developed, controlled and serviced by someone else); Private Label – when retailer contracts with a manufacturer to produce a product to his specifications, giving him maximum possible profit margin; Wholesale – when the retailer is selling someone else's product which he has purchased in bulk, just as a middle man; Store brand (SB)– A brand, usually for multiple products and unadvertised, for products only sold at a particular group of retail outlets. In

this study, PLs encompass all brands/labels sold in retail industry, which are not national brands (Nbs).

The assortment that retail chains sell as their PL products is often cheaper than the rest of the assortment in retailing. Therefore, customers with more sensitive response to changes in prices or low income are generally more interested in purchasing PLs. The basic feature of the PL products is the value assessment as a price-to-value ratio. Research on consumer preferences is of great importance in the context of competitive ability of branding/labeling. Developing market-leading brand/label capacities is essential for long-term competitiveness.

Global Scenario of Retail Industry and Private Labels

PLs are generally brands marketed by the retailer using the retailer's own name (e.g., Kroger, Safeway, Select) or a brand name associated with the retailer (e.g., Great Value and Sam's Choice of Wal-Mart). In last few decades, there has been considerable growth of PLs often at the expense of NBs. Sree Rama Rao (2010), Nestle has stable global and country specific national brands in its product line, but its expansion strategy is too pronged; in some markets it acquires well established national brands when it can and builds on their strengths – there are more than 7,000 local brands in its family of brands. Unilever also uses mix strategy – in Poland it introduced Omo brand detergent (sold in many other countries) but it also purchased a local brand, Pollena 2000. Despite a strong introduction of two competing brands, Omo by Unilever and Ariel by Procter & Gamble, a refurbished Pollena 2000 had the largest market share a year later. Sainsbury, avidly develops new products launching 1,400 to 1,500 new PL items every year and weeds out hundreds of others, no longer popular. PLs are important in Europe and in many developing countries compared to the US as observed by the growth in PL sales from 12 percent to 34 percent in Germany. The balance of power in the marketplace shifted in favour of the retailer, as can be explained by the remarkable growth of Wal-Mart in the US and other developing and developed countries. Forty percent of Wal-Mart sales consists of PLs (Rs. 5,16,600 crores); Fifty percent for Tesco (Rs. 1,47,600 crores) and they are capturing large portion of retail market in developing countries.

In the last decade, modern trade retail chains and their PLs are some of the most visible elements of the transformation in Central and Eastern European(CEE) countries. Roman Bazun's paper describes the situation and the potential of PLs in seven CEE countries (Hungary, Czech Republic, Slovakia, Poland, Lithuania, Latvia, Estonia) and Russia. TNS's Asian panel network, reports on the size and growth of the PLs FMCG sector in 48 countries.

A Synoptic View of Indian Retail Industry

In the post liberalization era, the retail industry in India had experienced an unprecedented boom. India is identified as the third most attractive retail destination in thirty emerging global markets, receiving global recognition and is witnessing a significant change in its growth and investment pattern. International retailers are also keenly watching the Indian government's policies, which presently allow foreign retailers limited entry only—either through franchising deals with local partners or joint venture partnerships with Indian companies. It is not just the global players like Wal-Mart, Tesco, Carrefour and Metro group are eying to capture a pie of this market but also the domestic corporate behemoths like Future Group, Reliance, Tata Group, Modi, Aditya Birla group, K Raheja Corp, and Bharti have entered the retail industry in big way. As per Business Encyclopedia (2017), current PLs sale of Bharti retail is 15 to 20 percent and company is planning to increase it to 30 percent. Revenue share of Shoppers Stop is about Rs. 200 crores. PLs share of Spencer's is 60 percent into 650 product categories and its sale of PLs is increasing at the annual rate about of 40%.

Modernization of the Indian retail sector is reflected in rapid growth in sales of supermarkets, departmental stores and hyper marts. Sales from these large-format stores expanded to fifty two percent from twenty four percent during 2008-18, according to a latest report by Euromonitor International, a leading provider of global consumer-market intelligence. In a developing country like India, a large chunk of consumer expenditure is on basic necessities, especially food, hygiene products, beverage, cosmetics, frozen goods, stationary products and tobacco accounting for as much as 63% of retail. Rise in sales through modern retail formats is expected to continue during the next few years, however, affected because of slowdown economy, but there is rapid growth in numbers of such outlets due to consumer demand and business potential.

In present retail market, by no means, PL is a cheaper imitations of mainstreams brands; these are unique products, designed to meet specific consumer needs. They are answer to the classic Indian consumer paradox: 'I don't want to spend more, but I want more from the product'; and meeting consumers' expectations. It is where the balancing of brand-consciousness and value-consciousness happens. PLs are creating a win-win situation for Indian retailers, consumers, as well as supporting 'Make in India' initiative. The current era symbolizes the wakeup call to NBs manufactures to effectively combat the challenges of PLs.

Review of literature

Richardson (1994) found that private-label brands were considered by shoppers to be inferior in quality compared to national brands. Burton (1998) pointed out that the danger for a retailer using low prices alone, to compete, is that some consumers may use price as a proxy for quality. There are vast differences in penetration of PLs depending on retail structure, culture, and geography worldwide. Seonaid Anderson and Helen Passingham's paper outlined the current status in Asia and predicts the future of PLs in Asia. The presence of PLs in Asia is linked to the development of trade structure by country as well as the presence of global retailers. Thomas Bachl's paper addresses the role of PLs within the perspective of Western Europe; reviews the main factors affecting PLs development within the region, the future of PLs vs. NBs, and the impact of super-centers and hyper-markets in the changing equity of PLs. According to Blazeska (2013), "a need to create low cost products and services; a need for creating loyal customers; taking the opportunity to make greater profits; the continuous change of shopping habits of consumers; fulfilling the unsatisfied needs of consumers". The Future group plans to increase its PL portfolio by adding more than 60 products to its PLs range; (An article by Mudra Institute of Communications, Ahmedabad -MICA in India Retail Report 2013). Technopak's report (2017), food and grocery segments are key drivers accounting for 20-25 percent, and sometimes even 40 percent of all categories in PLs. As per Business Encyclopedia (2017), Europe has the highest PLs brand share of approximately 49 percent from last ten years followed by US, Canada and Australia having about 18-24 percent, which shows a rapid growth of PLs. The same report has estimated growth up to INR 64,700 billion by 2018-19 in India.

Current Scenario of PLs in Modern Retail

Retailers are perceived as being brands in themselves rather than distributors of manufacturer brands. Many retailers have developed such a strong consumer franchise that customers are more loyal to the retailer's PLs than Nbs. It is mainly due to extensive development of ownbrand and a more marketing-oriented approach to retailing. Retailers have been rewarded for their focus on customer needs and aspirations by increased level of trusts from customers. Initially, products were positioned as cheap alternatives to manufacturers' brands, however, in recent years; retailers have upgraded the quality of their own branded goods. According to Nielson's retail audit of PLs across thirty countries and eighty product categories, PLs grew faster than

manufacturer brands. Consumers in developed markets, Europe and North America, are already big believers in PLs; and emerging markets of developing countries are catching up fast.

E-commerce in Retail Industry and effect on PLs

E-commerce entered market place in the country during early 2000's and has grown many folds in the last few years. With Jio, Indians are now quite well versed with terms like e-commerce. With nearly 600 million people using the internet and many preferring online shopping, retailers are targeting these price sensitive customers to create brand loyalty and earn high profit margins. Many retailers are using e-commerce platforms as preferred platforms for start-ups to launch their PLs. E-commerce sites also provide opportunity to behave like merchandise companies or to launch their exclusive retail operations. Needless to say, big international/national brands would not leave market place without giving a strong fight. These brands are looking to get a bigger chunk of the emerging \$200 billion e-commerce market of India. Nestle had announced its plans to launch lower-cost breakfast cereals. With Walmart's entry in India by \$18 billion purchase of the online retailer Flipkart, e-commerce war is likely to revolve around PLs. Online retail market increased from 10 to 15 percent during financial years 2013-14 and 2018-19, as per Business Encyclopedia (2017).

Great Challenge from International/National Brands

There had been some hiccups because of new FDI policy, but, recently the Department of Industrial Policy and Promotion said, "It is clarified that present policy does not impose any restriction on the nature of products which can be sold on the marketplace." International and national big players are entering in different ways into the retail market with their own PLs to give tough challenge to the local retailers. Samsung, the world leader in smartphone business, was struggling in India due to the fierce competition from its Chinese PL counter parts. Therefore, it recently launched various new smartphones for the Indian market. The company is also doubling its smartphone production more specific to the Indian market. Flipkart had invested \$40 billion in multiple fashion start-ups, whereas AKS clothing recently had crossed the INR 100 crore marks.

Increasing Acceptance of Private Labels with Indian Shoppers

There had been many ups and downs in retail industry during the last decade. Global recession in

general, and particular in India, has given significant thrust to acceptance of PLs by shoppers. Almost all major retailers like Reliance Retail, Future group, Aditya Birla Retail, Bharti, Wal Mart Retail, Hypercity, Infiniti Retail, Trent, Shoppers Stop etc., offer PLs in their merchandise mix. PLs has seen growth of groceries by 15% in super-markets and 30% in hyper-markets of its total value sales. Entry of PLs in apparels, footwear, toys, electronics, paper products, stationary, hygiene and appliances etc. enabled the retailers to expand their offerings. The Apollo Pharmacy and Guardian Pharmacy entered into PLs in 2010 in health, beauty and personal care products. Currently PLs market in India is estimated to be around Rs. 13 billion, which accounts for 10-12% of organized retail in India. Retailers, like Pantaloon, Trent, Shoppers Stop and Spencer's have increased their focus on PLs retailing. PLs constitute 90% of Trent's, 80% of Reliance's and 75% of Pantaloon's overall sales. Aditya Birla Retail had increased the share of own brands in sales from 3% to 10% in last three years.

It was estimated (Euromonitor, 2017), that PL margins for electronics goods is about 20% higher compared NBs and for clothing it is about 30 to 50%. Big retailers including, Future Group, Aditya Birla Group, Shoppers Stop, Reliance etc., have a rich list of PLs. Since these brands are owned by retailers themselves, their margins are higher and part of it can be passed on to the buyers in different ways, which enhances the interest of shoppers. Myntra launched its PLs named - Roadstar Go, Flipkart launched its PLs named Smart Buy, Amazon launched its PLs brands AmazonBasics which sells everything ranging from stationary to power bank, Echo which is basically a smart speaker brand, Solimo for dry fruits, Myx the women's clothing brand. Bigbasket is another big player in the arena having multiple PLs named as Fresho, Tasties, Royal, and Popular. As per various global watchdogs, Amazon can earn as much as \$25 billion of revenue by the end of 2022 from its PLs business.

Research Methodology

Objectives of the researcher:

1. What are the salient attributes at which consumer's choose PLs or NBs?
2. What are consumer's attitude to PLs and NBs?
3. Consumers' view on future of PLs.
4. Open end questions to find out reasons to buy PLs.

Research Design

Exploratory research design was utilized for this research.

Sampling Design and Data Collection

One hundred shoppers in two different standard popular stores in Gurugram, Haryana, were contacted in November 2019 to respond to the survey questionnaire. Customers for grocery and food products were included in the study. 94% customers responded and corrected questionnaires were received. Trained management students administered the questionnaires. Only those individuals were requested to fill the questionnaires, who shopped for food and grocery at least twice a month from organized sector retail stores. The names of well known organized sector stores were listed to enable them to respond to questions.

The study shows 61% responded affirmatively that they buy PLs. Total 34% of the respondents were male and 66% were female. The education level, 29% respondents had graduation, 38% were post-graduate and 33% had technical qualification. In terms of age, 41% were below 30 years, 38% between 30-40 years and 21% were over 40 years. Regarding income, 39% had a monthly income below 40,000INR, 38% had between 40,001 to 60,000 INR and 23% respondents had income over 60,000 INR.

According to these data, the average consumer profile that purchase PLs are woman up to forty years of age, with education of post-graduation and with average& high average monthly income.

Figure 1
Private labels

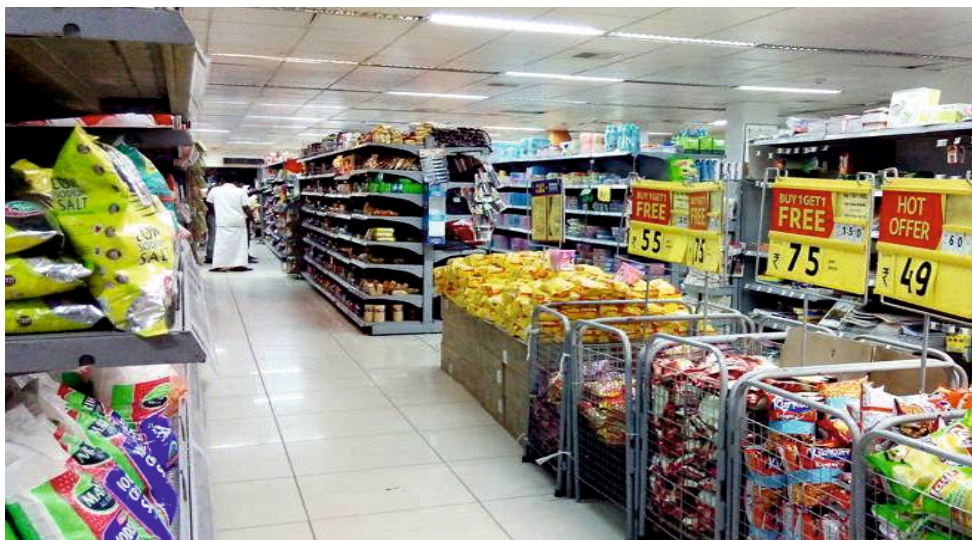


Table1**Comparative prices of few national brands vs. private labels**

<u>Product</u>	<u>Price per unit in INRs</u>		
	<u>National Brand</u>	<u>Retailer 'A' Local Brand</u>	<u>Retailer 'B' Local Brand</u>
Refined Oil 1 ltr	147	132	127
Liquid soap 750 ml	123	102	97
Detergent 1 Kg	103	88	87
Sanitizer 1 ltr	691	533	523
Tomato Sauce 500ml	206	165	154
Room Fresher 500 ml	232	197	179
Tea 1 Kg	376	317	315
Vermicelli 1Kg	167	59	58
Desi Ghee 1 ltr	540	432	412
Floor Cleaner 1ltr	157	117	105
Total (INR)	2,742	2,142	2,057
%age of Savings	--	22%	25%

Table 1 above shows that the prices of PLs are lower than those of NBs, in some product categories even lower than 35%.

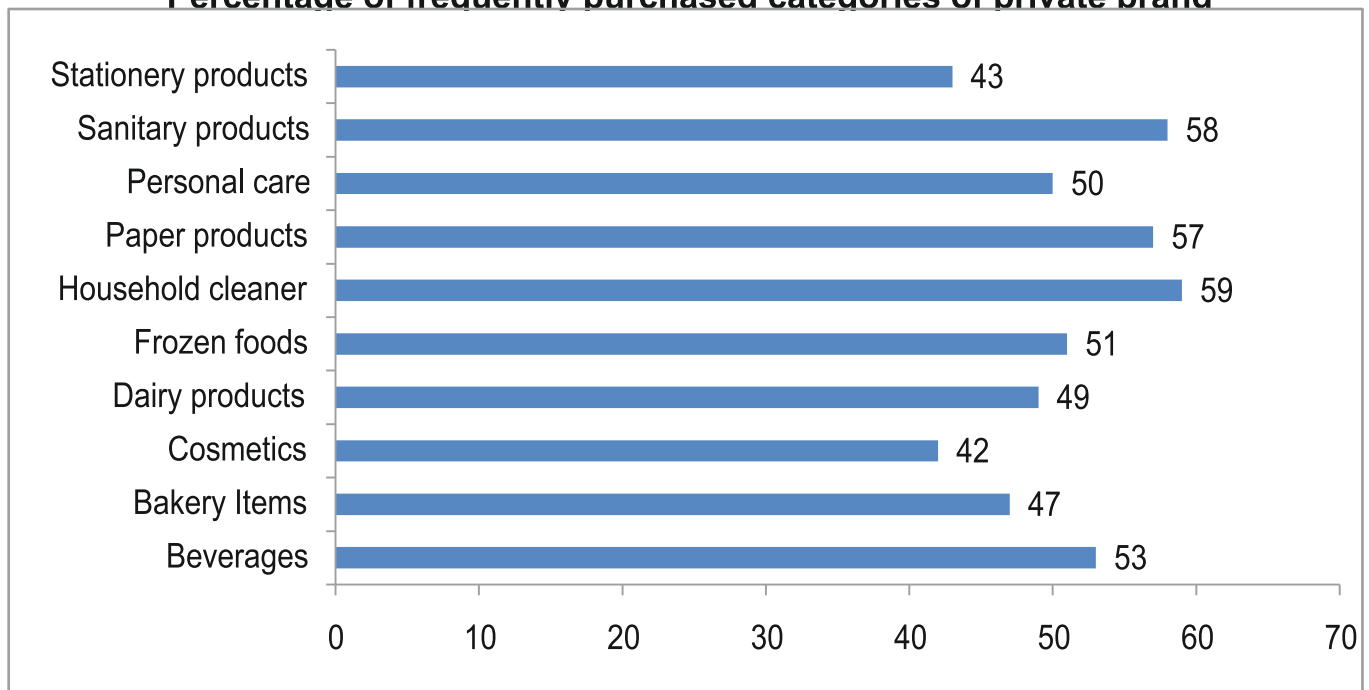
On the question of what kind of range/categories PLs consumers buy frequently, they provided the following responses which are described in Table 2 and Figure2, below:

Table 2**Percentage of frequently purchased categories of private brands**

<u>Product Range</u>	<u>Percentage</u>
Beverages	53
Bakery Items	47
Cosmetics	42
Dairy products	49
Frozen foods	51
Household cleaners	59
Paper products	57
Personal care	50
Sanitary products	58
Stationery products	43

Figure 2

Percentage of frequently purchased categories of private brand



The above table 2 and figure 2 shows that shoppers are maximum inclined to purchase PLs in household cleaners followed by sanitary products; paper products; beverages; frozen foods, personal care; dairy products; bakery items; and cosmetics.

Conceptualization

Multi-attribute models and brand attributes drawing from past studies, various attributes have been identified to assess the consumer's evolution. Based on review of the studies following PLs attributes in priority have been included:

- Price
- Risk
- Freshness
- Prestige
- Quality
- Health
- Brand image
- Packaging

The “Adequacy-Importance” of multi-attributes model is used here, which happens to be one of the widely used models appearing in consumer behavior research. This “Adequacy-Importance” model can be described as follows:

Table 3
Price Quality Strategy

Private Label -Product Attribute and Category Choice	Implications
Lower price and higher quality	Most beneficial category to enter if the lower price can come from disintermediation and part of the savings can be used to enhance quality and raise the retailer's margin
Lower price and lower quality	Retailer must know his segment. Is inventing a new segment? Needs to be sure of the PQ -WP equation
Higher price and higher quality	Niche. Does retailer have customers who will pay premium?
Higher price -lower quality	Rejected

$$A = \sum P * D$$

Where –

A = Individual's attitude towards the brands

P = Attribute's importance (dimension) for the person

D = Individual's evolution of brands w.r.t the corresponding attribute (dimension).

The Survey

Eight brand attributes were identified & fitted into this model. For measuring the importance ('P' in the "Adequacy-Importance" model) according to each of the eight brand-attributes on 5point category scale; where 5=most important and 1=least important, the following questions were asked:

- I believe that the price I pay for goods should give me value for money is.....
- I believe that the quality that I should get when I buy a product is....
- I believe that it isthat the products I buy are free from risk.
- I believe that I am buying healthy goods is...
- I believe that I am buying fresh goods is...
- I believe that buying goods with a very good brand image is.....
- I believe that it is that the goods are buying are prestigious
- I believe that good quality packaging of goods is...

Individual's brand-attribute question will then be multiplied with corresponding question evaluating the degree of presence of the attribute in both PLs and Nbs.

Questions measuring 'D' in the "Adequacy-Importance" model was rated on a 5 points Likert scale; where: 5=strongly agree and 1=strongly disagree:

- I believe that PLs available in the store are excellent value for money...
- I believe that PLs available in the store have excellent quality....
- I believe that PLs available in the store are risk-free to buy...
- I believe that PLs available in the store are healthy...
- I believe that PLs available in the store are fresh...
- I believe that PLs available in the store have an excellent image....
- I believe that PLs that the goods are buying are prestigious
- I believe that PLs available in the store have excellent packaging....

Same questions were asked by replacing "private brands' with 'national brands'.

Data Analysis

Attitude towards PLs for the 94 respondents were calculated as per the following:

$$Apl = P1 * Dpl1 + P2 * Dpl2 + P3 * Dpl3 + P4 * Dpl4 + P5 * Dpl5 \dots P94 * Dpl94$$

Where

Apl = Individual's attitude towards the PL

P = Attribute's importance (dimension) for the person

Dpl1 = Individual's evaluation of PL w.r.t the corresponding attribute (dimension).

For attitude towards national brands for all 94 respondents the same formula will become:

$$Anb = P1 * Dnb1 + P2 * Dnb2 + P3 * Dnb3 + P4 * Dnb4 + P5 * Dnb5 \dots P94 * Dnb94$$

Where

Anb = Individual's attitude toward the NB

P = Attitude's importance (dimension) for the person

Dnb = Individual's evaluation of NB w.r.t. the corresponding attribute (dimension).

Calculations were done for all eight attributes, which is given in Table No. 4 below:

Table 4

Test of significant difference between attitudes towards PL vs. NB

Brand Attribute N=94	Attitude towards PLs		Attitude towards NBs		t-test for equality of means; df:94
	Mean	Std. Dev.	Mean	Std. Dev.	
Price	17.2	1.15	15.4	2.24	6.26*
Quality	12.4	1.33	16.8	1.23	-14.94*
Risk	12.6	1.44	16.5	1.29	-12.03*
Health	14.1	0.99	13.8	1.13	1.99
Freshness	13.8	1.81	13.5	1.99	1.35
Brand image	11.1	1.66	13.0	1.21	-8.19*
Prestige	12.1	0.34	13.5	1.35	-10.54*
Packaging	12.5	1.22	12.4	1.41	1.97*

The t-test values denoted by Asterix (*) convey that there the difference in means is statistically significant at the 5% significance level (calculated t-value greater than 2.0).

Discussion

Data analysis of consumer attitudes towards NB and PL shows that there is perceived difference between NB and PL on the attributes of price, quality, risk, prestige and brand image. However, there appears to be no perceived difference on the attributes of health, freshness and packaging. It could be due to sustained efforts on in-store promotions of PLs. On all other factors, the comparison between private NBs and PLs is as follows:

NB>PL (NBs perceived to be better than PLs): Quality, Risk, Prestige and Image.

PL>NB (PLs perceived better than NBs): Price.

PL=NB (PLs and NBs perceived to be the same): Health, Freshness and Packaging.

Results of study are not different from the results obtained in other retail market studies. Price and Quality perception are an important element relating to PLs use, brands in a category are seen as sharing a similar quality, and then PL use is often observed to increase. In this study, finding shows that reduced price and improvement in quality, health, freshness, and packaging of PLs draw the attention of customers.

Conclusion and Managerial Analysis

PLs are becoming redoubtable competitors, as they provide retailers with high margin. These PLs receive preferential shelf space, strong in-store promotion; perhaps most important for consumers' appeal, since these are quality products at low price and also provide value for consumer's money. Retailers' PLs are available in beverages, bakery items, cosmetics, dairy products, frozen foods, household cleaners, paper products, personal care, sanitary products, stationery products and distribution is only available within the retail chain. PLs are capturing local areas in different new product categories. They are expected to increase their market share and become more pervasive in variety of products. The result is that manufacturers of NBs are under tremendous pressure to cut prices, pass-on profits to consumers in different ways, further improve their quality to ensnare customers and use promotional schemes for retailers. To capture further market and retain the share, the retailers of PLs have to further improve/maintain their product quality, packing, freshness, thereby reducing the risk factor.

Basic reasons for the development and growth of PLs

- The shift of power from national brand marketers to national retailers
- The ready availability of high quality and low priced PLs production capacity
- A strong “house brand” perspective of key retailers
- Introduction and growth of e-commerce
- Entry of new global and national players in retail industry as well as in PLs.

Reasons why private label brands are thriving in today's market

- Providing better value: PLs offer comparatively good quality items at reduced price and almost 74% of consumers say that private brands are now a better value for their money. Approximately 60% of respondents said they want to see more deals customized to their shopping habits. Top retailers are using private-label brands to do so, with some now offering proprietary brands in sectors of clothing and beverages.
- Driving loyalty: The more unique a retailer's private-brand lineup is, the more loyal its shoppers are. Consumers said they shop at a store specifically for its private brand. Increased loyalty aligns with trustworthiness too, and about 68% of consumers said they trust private-label brands just as much as national brands.

- **Prioritizing health:** Wellness brands are the fastest growing private-label segment. Touching on the healthy-eating trend most of the consumers said they want to see more private brands in the fresh category. More so because retailers with proprietary brands notice the request and concern of their consumers like removing sugar and sodium from private-label products.
- **Emphasizing customization and experience:** PL retailers are dabbling with create-your-own products and services, that too for a good reason. Approximately 73% of the consumers have chosen, recommended, or paid more for a brand that provides a personalized experience or service. Moreover, younger consumers want an engaging shopping experience that includes interacting and providing feedback to retailers. Around 77% of millennials said experiences are more important than products.
- **PLs made for India:** Indian market is complex and diverse. Markets are within market, with each set of consumers exhibiting needs and preferences that are influenced by their distinct culture and lifestyle of their region. Consumer habits and preferences yield some very interesting insights as per the recent survey.
- **With PLs retailers and customers in win-win situation:** Optimization of supply chain enables retailers to pass on the benefit of cost to the consumers, thus best value for money, 'win-win' situation or offering 'more for less'.

Future Impact of Private Labels

Many retailers have increased their overall profits by offering PL products, since there are colossal margins to be achieved from PL products, which are 30-40% higher margins than branded products. Retailers are not any more offering low quality products for a lesser price, but they are creating new levels of differentiation, better pricing for a good quality product with new merchandising and promotion strategies. As per retail IBEF's report for the fifth time, India has topped the Global Consumer store formats constitute a major part of Indian retail store for the largest share of revenues at seventy four percent of the total retail with introduction of several domestic and international apparels.

One major advantage to the retailers in India, and which works in favour of PLs, comes from the

fact that Indian consumers are less brands conscious and more price, quality and freshness conscious. Most major retailers have introduced PLs not only in food & grocery products, but also in apparels, accessories, consumer durables, toys, healthcare, home furnishings. Business Encyclopedia (2017) reports growth of PLs in apparel industry from present US \$ 45 billion to 122 billion by 2025 in India. Aditya Birla's PL is covering seven brands across 290 products category and increasing its share day by day. Spencer's PL has increased its share from 10 to 20 percent in food category, beverages, homecare and personal care. Panataloons' PL brands Tasty Treat, Fresh n Pure, Cleanmate, Caremate, Sachn have increased their share from 15 to 40 percent. KPMG have market penetration share from 20 to 30 percent.

Future Studies

Possible areas for future studies could be: The positioning of NBs/regional brands vs PLs and strategies need to be adopted to counter each other and generate healthy competition, to study about the label, private label or whole sale or store brands which are more used or liked by consumer, studying the types of strategies the national brand manufactures are using and mapping the progress by using mix strategy in NBs and PLs, studying the impact of competition from PLS on the prices of NBs and exploring the types of loyalty or retaining strategies used by the retailers to retain their customers.

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An Analytical Study of Consumer Buying Behavior in Context of Two Wheelers

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Abstract

Two wheelers are important medium of transportation in India. It is very popular in middle class. Certain aspects are considered before purchasing a two wheeler. Such as looks and design, fuel efficiency, engine capacity, on road price, maintenance cost etc. After a through searching and extensive analysis, a customer takes the decision to purchase a particular brand of two wheeler. As a two wheeler, serves for several years. The decision related with its purchase is generally not done in a very short time span. In our present study, we have tried to analyze & sum up the major factors that are considered while purchasing a two wheeler out of a number of factors. Whenever a customer, is going to purchase, a two wheeler, although he may think on several dimensions, before making a purchase but there are two or three factors on which he emphasizes the most. An analysis of consumer behavior is our concern.

Introduction : In modern world , everyone requires to commute from one place to another place. Remaining static is not practical & feasible in our society. There are various methods of transportation available around us. Out of them opting the ride of two wheelers is also one of the options. It is time saving and economic in nature. Two wheeler ride is very popular in countries having low or medium per capita income. Basically scooties and motorbikes come under this category. It is a preferred mode of transportation for middle class people. Several benefits are associated with them. Two wheelers are economic option for transportation consuming little fuel in comparison to four wheelers. Millions of two wheelers across the world perform the transportation services. Indian auto industry sold 11.77 million units in 2011. Sales of two wheelers show a rapid rise in this decade. Year 2019 witnessed sale of 21 million units. Two wheeler production comprises majority of vehicles produces in India.

Objectives of the study: Two wheelers are important medium of transportation to millions of people worldwide. Some people buy them for entertainment rides. There are various aspects that

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influence the decision of the buyer to purchase a two wheeler, such as low price, fuel efficient, engine capacity, brand name, after sales service, looks and design, discount schemes etc. A buyer has several things in his mind before making the purchase decision. In the study it is an attempt to search out for main factors out of so many factors responsible for making the purchase decision. For the sake of convenience a large city, Meerut in western Uttar Pradesh is selected for the study. The data is gathered from this city.

Research methodology: To conduct the research, it is essential to have a structured format of study. A mix of exploratory research design and descriptive research design is used, such type of pattern is suitable for this research as we want to explore the factors responsible for the decision of purchase of two wheelers. To do it , we need a properly structured closed ended questionnaire with several questions so inspite of using a single research design, the mix research design has been proved useful.

Sampling technique: Convenience sampling is used. Samples are taken from four different zones, east, west, north & south of the city and a total of 137 respondents have been surveyed.

Data collection: For effective study, both primary and secondary data is collected. Secondary data is collected from various magazines, journals, books, news papers etc to have a better insight into the topic. Primary data is collected with the help of properly constructed questionnaire.

Data analysis: SPSS software is used for data analysis. Factor analysis technique is adopted to find out relevant factors responsible for the purchase decision.

Limitations of the study: Due to time paucity, sample of only 139 respondents have been surveyed. If the sample size would have been bigger more accurate results could be produced.

Review of literature:

Dr. Duggani yuvaraju (2014) study at Tirupati indicated that significant difference exists among the preferred factors for purchase decision of two wheelers such as design, mileage, pickup and price. He suggested for more emphasis on T.V ads, service at the doorstep and reduce the cost of

two wheeler. Karolina iliesaka (2013) in her study found that marketing managers must make provisions for the improvement of services quality in two wheelers to augment their sale. Saraswathi. S (2008) in the study of post purchase satisfaction level of customers of two wheelers in Hyderabad & Secunderabad city emphasized that services in specific problem areas should be improved such as specialized skills, test ride satisfaction etc. Zamazalova (2008) has stated the main factors behind customer satisfaction regarding two wheelers. These factors were product quality, price, distribution and image of the brand. Dr. Raj A. Jesu Kulandai, & Prof. Kaviarasu S. John (2015) mentioned in their study that buying behaviour of two-wheelers in Chennai city is influenced by a number of marketing stimuli offered by the manufacturers. Most of the respondents have stated that Fuel-efficient, reliable brand and availability of spare parts are the most preferred factors for buying of a two wheeler. Dr. Ronald Mani & Mr. Debasis Tripathy, (2013) assessed the customers buying behaviour of two wheelers owners from Allahabad, Lucknow and Varanasi cities Most influencing factor was design followed by mileage, further speed & technology. Rajesh Mahotra & Sachin Kumar Sharma, (2012) conducted the study on the two wheeler consumers purchasing behaviour. This research also focused on the market size of various two wheeler producers in Jaipur city. The research concluded that Hero motor corp is first while Bajaj is second in terms of market size. Research highlighted mileage and power as most important factors while price was least important according to customer. M. Sathish & A. Pughazhend, (2011) studied to know the buying motives of consumers and their behaviour regarding two wheelers. Customer decision factors are need, purchasing power and the price of the two-wheeler. Research indicated that though the customers may not have sufficient purchase power then also they preferred costly two wheelers over cheap two wheelers. It was due to their features, reliability and aesthetic value.

Findings & Analysis:

Table 1

		Age			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<25	85	61.6	61.6	61.6
	25 to 30	20	14.5	14.5	76.1
	31 to 35	12	8.7	8.7	84.8
	36 to 40	9	6.5	6.5	91.3
	>40	12	8.7	8.7	100.0
	Total	138	100.0	100.0	

Table 2

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	95	68.8	68.8	68.8
	Female	43	31.2	31.2	100.0
	Total	138	100.0	100.0	

Table 3

Family income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<2.5 lakh	68	49.3	49.3	49.3
	2.5 lakh to 5 lakh	34	24.6	24.6	73.9
	>5 lakhs to 7.5 lakhs	18	13.0	13.0	87.0
	>7.5 lakhs	18	13.0	13.0	100.0
	Total	138	100.0	100.0	

KMO and Bartlett's Test

Table 4

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.844
Bartlett's Test of Sphericity	Approx. Chi-Square	272.196
	df	45
	Sig.	.000

Table 5**Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.442	34.418	34.418	3.442	34.418	34.418	2.761	27.607	27.607
2	1.212	12.122	46.540	1.212	12.122	46.540	1.636	16.364	43.971
3	1.036	10.359	56.899	1.036	10.359	56.899	1.293	12.928	56.899
4	.771	7.708	64.606						
5	.696	6.962	71.569						
6	.670	6.704	78.273						
7	.637	6.368	84.641						
8	.570	5.705	90.345						
9	.553	5.529	95.874						
10	.413	4.126	100.000						

Extraction Method: Principal Component Analysis.

Table 6**Rotated Component Matrix**

	Component		
	1	2	3
On road price	.722	.072	-.013
Engine capacity (cc)	.364	.036	.678
Looks and design	-.050	.143	.824
Fuel efficiency	.689	.107	.140
Running Maintenance cost	.522	.391	.212
Discount schemes	.771	.099	.092
Resale value	.736	.172	.099
After sales service	.450	.531	-.160
Driving pleasure	.045	.765	.207
Purpose of purchase	.130	.734	.055

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Out of the total 138 respondents covered 85 are lesser than 25 years of age, 20 are from 25 to 30 years of age, 12 are from 31 to 35 years of age, 9 respondents are from 36 to 40 years and 12 are above forty years of age. It is clear that the majority of respondents are youngsters. 76.1 % of

respondents are up to 30 years of age. 95 respondents are male and 43 respondents are female. It indicates that majority of respondents are male. 68 of the respondents have less than 2.5 lakh Rs income per annum. While 34 respondents have, income from 2.5 lakh to 5 lakh Rs per annum. 18 respondents have income from 5 to less than 7.5 lakh Rs per annum. Another 18 respondents have annual income more than 7.5 lakh Rs per annum. We can say that 73.9 % of respondents have income up to 5 lakh Rs per annum. So this is the segregation of respondents as per age, gender and income.

Table 4 shows the value of KMO test. It is Kaiser-Meyer-Olkin measure of sampling adequacy. It indicates the proportion of variance in variables that might be caused by underlying factors. High values from .5 to 1 indicates factor analysis is appropriate. While values less than .5 indicates that factor analysis is not useful. The value of KMO is .844, it is significantly high. Clearly indicating that Factor analysis is appropriate in such condition. When we go for Bartlett's test of sphericity, we find the value of p is .00, which is also significant. When the value of test is less than .05, its value is significant and factor analysis is applicable. It leads to the rejection of the assumption that the correlation matrix is an identity matrix. We can say that the initial set of variables are highly correlated. As here all the three factors have eigenvalues more than one.

Now when it is finalized that factor analysis is appropriate for analyzing the data. We proceed further. Our goal is to identify the minimum number of factors that will be responsible for maximum variance in data. Then we adopt the method of principal component analysis. Here, the factors are known as principal components. Table 5 shows the application of principal component analysis. The first part of the table gives the initial Eigen values. The Eigen value for a factor indicates for the variance caused by the factor.

In our case, the total variance caused by all the ten factors is ten. Because the total variance accounts for the total number of variables. The variance caused by the first factor is 3.44, that is $3.44/10$ or 34.41 % of the total variance. Similarly, the variance caused by the second factor is 12.12 % and the variance caused by the third factor is 10.35 %. The total variance caused by these three factors is 56.89 %. We follow the approach of considering the number of factors with more than one eigenvalue. Here, only three factors have eigenvalue more than one. The second table shows the variance before rotation. The third part of the table shows the variance explained

by the extracted factors after the rotation.

Though the unrotated factor matrix shows the relationship between individual variables, it does not supports too much for the factors that can be interpreted. For the sake of interpretation, factor matrix is rotated. The variance is redistributed among different factors after rotation. Although the total variance remains same before rotation and after rotation. We have used varimax method of rotation. It minimizes the number of variables with high loadings. Therefore, making the interpretation of factors easier. The result of factor analysis indicates three factors. These three factors are shown in table 6.

Factor 1 has high coefficients for variables, on road price (.722), fuel efficiency (.689), running maintenance cost (.522), discount schemes (.771), and resale value (.736). All these variables are associated with each other. These variables represents money factor ie money could be saved or not. Therefore , we label factor 1 as money saving factor. This factor clearly indicates that the general public is too much concerned to save money while making the decision to purchase a two wheeler. While purchasing the money should be saved and even after purchasing it should be economic in running. At last, it should give some resale value. Therefore, the biggest cause of concern for customers while making the decision to purchase the two wheeler is money. Money should be saved in any case.

Factor 2 has high coefficients for variables, after sales service (.531), driving pleasure (.765) and purpose of purchase (.734). The customer is clearly concerned with the services that will be provided after the purchase of two wheeler. It could be anything after sales service, driving service or service provided to the customer by the wheeler after the purchase. It could be any type of service. Therefore, we label this factor 2 as services factor. We can say that the customer is interested in services associated with the two wheeler.

Factor 3 has high coefficients for variables, engine capacity (.678) and looks and design (.824). Both of these variables are related with the features of two wheeler. It is looking attractive or the capacity of engine is good. Hence, this factor is labeled as Features. Clearly the customer looks into the features of the two wheeler before the purchase of a two wheeler. In a nut shell, we can say that there are three basic factors -money saving, services and features, on which the customers emphasize before purchasing the two wheeler. The research can add value to two wheeler manufacturing companies. They can improve on these factors useful for customers and can actively promote their sales.

Conclusion: Purchase decision of two wheeler is a complex process. Two wheelers are a popular medium of transportation. Several things are considered before making the purchase decision of a two wheeler. In our study, the foremost factor is money saving factor. The customers are keenly inclined towards saving the money while purchasing the two wheeler. They need economy in purchase. The second important factor is the services that will be provided by the two wheeler. Customers actively require specific convenience before making the purchase decision. The third important factor is features. There are certain features that are required by the customer while finalizing the purchase decision.

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Food Supply Chain Management : CSR, Traceability and Associated Concerns

Vibha Singh

ABSTRACT

Food Supply Chain Management (FSCM) is important to avoid food wastage. Some cases of FSCM have been discussed viz. Halal, Dairy, Processed food. Four kinds of supply chain risks have been elaborately discussed in the case of dairy industry. As far as Corporate Social Responsibility (CSR) is considered, there are mainly 8 elements: animal welfare, biotechnology, health and safety, environment, labor and human rights, community, fair trade, procurement. FSCM Traceability is explained using its four factors, namely breadth, depth, accuracy and access. Hindrance motivated FSCM strategy has been taken into account as it can be proved a potential solution for solving common supply chain problems. It is based on the principle of identifying the key barriers in a supply chain and eliminating them through proper modelling and simulation. Importance of quality control in food supply chain management has been discussed. Various cases have been taken into consideration which highlight the significance of quality commitment towards consumer and looking beyond food safety as well food quality through the lens of food defence. Last but not the least, sustainability in food supply chain has been described.

KEYWORDS

Halal, Dairy, Processed, Corporate Social Responsibility, Traceability, Sustainability

INTRODUCTION

As the food is reaped and collected, it should be reserved, conveyed and distributed in order to make sure that it gets to the final consumer on time. It has been promulgated that about one-third of the food is wasted every year. This one-third amounts to approximately 1.3 billion tonnes. Out of this one-third, about two-thirds of the food wastage i.e. 1 billion tonne takes place during supply chain [14]. For instance, the primary reason behind the wastage of 492 million tonnes of biodegradables like fruits and vegetables globally in 2011 was incompetent Food Supply Chain

Management (FSCM). So, FSCM is very much important to prevent food wastage.

FEW CASES OF FOOD SUPPLY CHAIN MANAGEMENT

➤ Halal Food Supply Chain Management (HFSCM)

Halal Food Supply Chain Management can be explained as “controlling and administering the flow of material, information and capital; through strategic coordination and collaboration of stakeholders, as to create value to improve the performance of the supply chain, in such a way that Halal and Topyib is extended from farm to fork” [5]. The utmost important feature which needs to be kept in mind while tackling HFSC is “integrity risk prevention”. As this supply chain follows farm-to-fork concept, integrity risk becomes a major issue. Although food industries implement various quality systems to minimise the risk but these procedures alone are not enough if we look at the broader picture.

➤ Dairy Food Supply Chain Management (DFSCM)

Perishable commodities like dairy suffer the risk of very limited shelf life, which in turn leads to product wastage if their inventories are not managed properly in the supply chain. The paper titled “Risk analysis and mitigation for perishable food supply chain: a case of dairy industry” highlights four kinds of risks in the supply chain: environmental risk, supply risk, demand risk and process risk [11]. The detailed description of these four sorts of risks is given below:

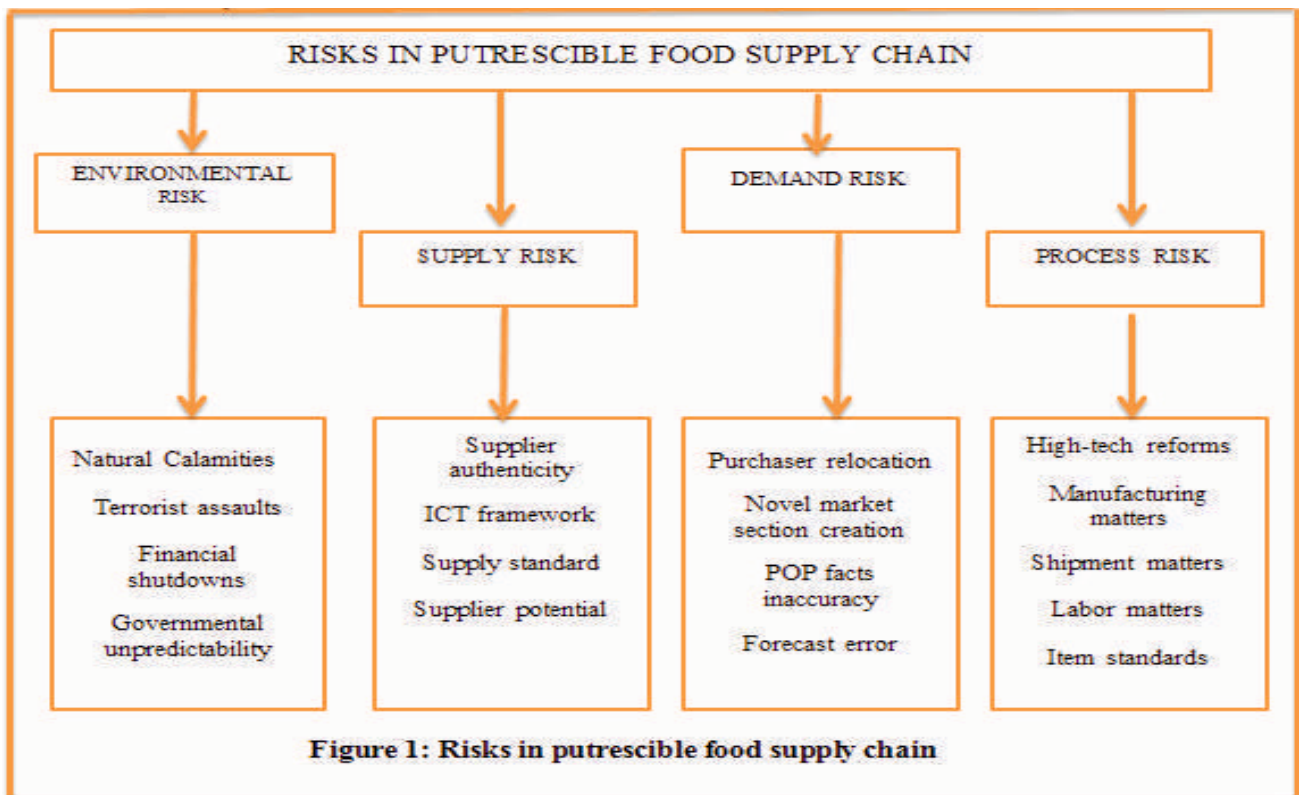
➤ **Environmental Risk:** These risks result from the outward surroundings in which the supply chain has to function. There are a very broad variety of environmental elements which can affect a particular unit or the entire supply chain. Some exemplars are dangers resulting from natural calamities and terrorist assaults, financial shutdowns and governmental unpredictability. The earth tremor and following seismic sea wave in Japan (2011), shifting of Tata Motors Ltd. car manufacturing plant to western segment of India (Sanand, Gujarat) from eastern segment (Singur, West Bengal) (2008) were environmental risks that happened.

➤ **Supply Risk:** Supplier is a very significant component of the supply chain. If supplier becomes non-performing, it can lead to a number of problems related to article standards, impediments, article stature etc. Hence, it is very crucial to lower the downstream perils of the supply chain. As

far as putrescible food supply chains are considered, supplier authenticity, ICT framework, supply standard and supplier potential are the upstream perils to be tackled. According to Norman et al. (2004), selection of numerous suppliers is a much more preferable concept for minimizing operational and disruption risks [10].

➤ **Demand Risk:** Demand risks result from the variation in the demand for the items. Apart from dealing with unpredictability in volume, demand risks also circumscribe demand mix when we consider numerous product forms. This category of risk emerges from purchaser relocation, novel market section creation, deformed knowledge sharing by traders, point of purchase (POP) facts inaccuracy and perils of prediction mistakes.

➤ **Process Risk:** These internal risks originate due to the processing of raw material into final marketable item in the company. High-tech reforms in factory and item standards, manufacturing matters, shipment matters, and labor matters fall under this risk category. 2011 Maruti Suzuki plant labor walkout serves as a well-suited example for this risk category, which led to an abrupt stop in car production for almost a month. A schematic representation of four kinds of risks is given in figure 1 below.



➤ Processed Food Supply Chain Management (PFSCM)

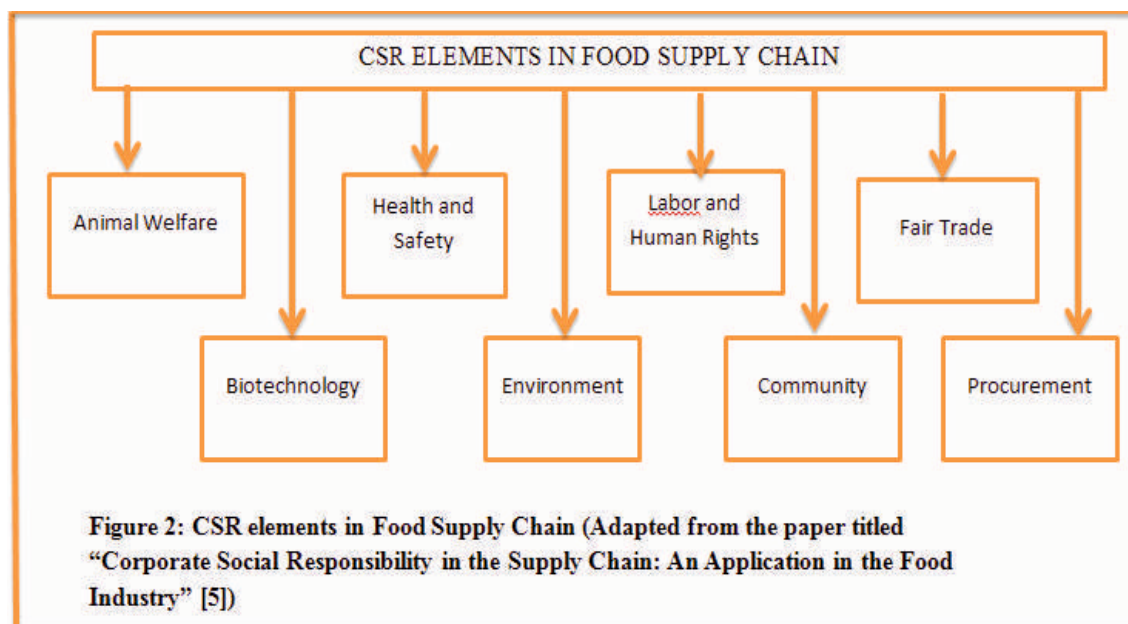
All food that has undergone through some value addition is known as processed food [7].

The three stages of processing involved in preparation of these foods are as follows:-

- STAGE 1: This involves cutting, washing and packaging newly harvested foods and vegetables and selling them at +4 to +6 degree.
- STAGE 2: This stage involves actual preparation of processed food by changing fruit and vegetable particles, puree, chilled fruits and vegetables, meat, poultry and fishery. There is a need for refrigeration units at this stage.
- STAGE 3: This stage involves manufacturing of juices and ketchups, namkeens (Indian snacks like groundnuts, potato fries etc.), snacks, noodles, canned food, coffee, tea bags (under ambient environment), sterilized milk, curd, gelato (makes use of freezer).

As per the nature of foods, it varies whether refrigeration units are required for PFSCM. For instance, items related to bakery and fast moving consumer goods (FMCG) do not need a cold chain.

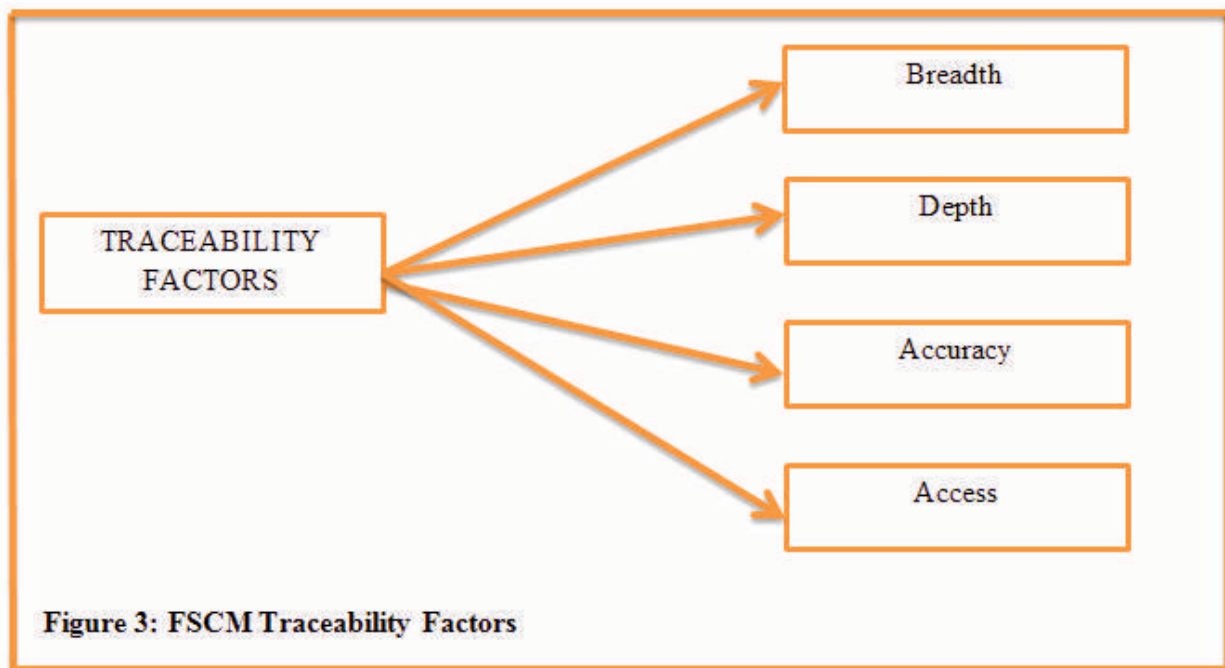
CORPORATE SOCIAL RESPONSIBILITY (CSR) ELEMENTS



After going through several publications, it has been concluded that CSR is emerging as a vital aspect of food industry. In addition to the primary fact that food is the basis of our existence, the other reason behind CSR acquiring such importance is the complex, manpower intensive character of food supply chains.

Efforts have been made by some ethics researchers to systematize CSR components of the food supply chain. For instance, Wade et al. (2001) assessed attributes like wildlife well-being, equitable commerce, bioengineering, fitness and agrarian practices [9]. On similar lines, Busch et al. (2003) appraised well-being, security, surroundings, manpower, quality and wildlife health [1]. As noted by Maloni et al. (2006), the drawback of these publications is that they do not minutely evaluate the analogous supply chain inferences. Moreover, they do not include few teachings validated through Purchasing Social Responsibility (PSR) / Logistics Social Responsibility (LSR) texts. This is how Maloni et al. (2008) came up with an elaborated structure of CSR utilisation in the food supply chain, as indicated in figure 2 [8].

FSCM TRACEABILITY



Traceability can be explained using the following four factors [9]:

- BREADTH: quantity of characteristics attached to each traceable entity.
- DEPTH: the extent to which traceability system (TS) traces the batch without any error. This

process can proceed either in upstream or downstream direction in the supply chain.

- **ACCURACY:** the level of surety with which the system can identify a specific item's motion or features.
- **ACCESS:** the pace with which tracking and tracing details can be conveyed to supply chain members and the pace with which sought particulars can be dispersed to public health officers at the time of food-associated exigencies.

HINDRANCE MOTIVATED FSCM STRATEGY

Many unit operations get involved as the food item moves through the supply chain. If we look at the food supply chain closely, we will observe that the key people involved are: transportation people which ensure that the food reaches at its destination on time, logistics people, consumers who can be either retailers or final product users. Every bit of the food supply chain is very much “guided and monitored”.

Inspite of the fact that food supply chain is so well regulated, there are many hindrances which still manage to seep into the robust food supply chain management structure [12]. This is because FSCM is a very complicated affair which is influenced by several social, economic and environmental factors. This complicated nature of FSCM can be attributed to many factors like consumer preferences, production, manufacturing etc. Amidst all this, employees of FSCM try to optimise the whole process and achieve the required balance. Therefore, there is an approach called “hindrance motivated approach” which can help in ensuring smooth functioning of the supply chain by removing the common hindrances (problems) encountered in a supply chain. These common problems can be related to environment, food shelf life, traceability, transportation, logistics etc.

QUALITY CONTROL IN FOOD SUPPLY CHAIN MANAGEMENT

Quality control is an integral part of food supply chain management. Hu et al. (2019) in his paper has highlighted the importance of four-echelon theory in quality control of food supply chain [4]. As most papers concentrate on two-echelon supply chain theory, research on four-echelon is much appreciated. Study clearly concludes that amongst all the criteria considered, “quality commitment” to the end users is the most important thing.

In order to understand quality control aspect in food supply chain management better, Chen et al. (2014) studied the famous case of Chinese adulterant milk [3]. Results indicate that instead of random disseminated strategy, there is a need for “conclusive” plan. Through the implementation of a conclusive plan, we will be able to integrate good features in the required pattern to achieve the end result.

Ling et al. (2020) in his study emphasized the need to look one step further than “food safety and food quality” to achieve the goal of proper quality control. Research elaborates on the idea of “food defence” to ward off the threats which cannot be prevented by keeping only food safety and food quality in mind [6].

SUSTAINABILITY IN FOOD SUPPLY CHAINS

Food supply chains manufacture, operate, dispense and deliver items via a complex nexus of interconnected players. This present framework and concept of supply chain is the real cause of unsustainability [2]. In spite of the fact that every player in the supply chain can add to the general sustainability of the finished item, the truth is that we need much more systematic attempts to gain noteworthy developments. So, players involved in the supply chain must strive to watch beyond their frontiers and involve numerous varied members in this revolution. Many times, these members are not the main partners of the organisation, but less conventional players like non-governmental organisations (NGOs) or research centres.

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Impact of Last Mile Delivery in E-Commerce Industry: An Indian Customers' Perspective

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Dr Smriti Asthana²

ABSTRACT

E-commerce as the fruit of internet and commerce is growing with a rapid speed in India. It has not only contributed to the economy, but also has shaped people's way of living, especially with the service of home delivery. Today a consumer enjoys the various choices of products with reasonable prices and the convenience of receiving the parcels with a single click of a mouse. Meanwhile, the problem of not-being-at-home and repeated delivery have caused trouble for both consumers and logistics service providers. Therefore, it takes a lot of co-operation and innovations to build this convenience, which we call 'last mile delivery(LMD)'.

This research paper aims at identifying the bottlenecks and exploring the possible solutions to these bottlenecks in the last mile delivery service in India, under the background of growing popularity of e-commerce from the perspective of consumers. Since consumer needs are in the center of e-commerce and last mile delivery for any company in the world, thus the researchers have made an attempt through this research paper to bring to light the consumers' expectations and the factors that determine their present satisfaction level from the last mile delivery, this will give an important direction and implication for e-commerce retailers and the logistics service providers in India.

Keywords: Last Mile Delivery, E- Commerce, Logistics Service Provider, Third Party Logistics

1. Introduction

“Indian economy beating the expectations of the market of 6.9 percent grew 7.2 percent year-on-year in the last three months of 2017. It is the strongest growth rate since the third quarter of 2016, boosted by a jump in investment and public spending (Trending Economics 2018)”.

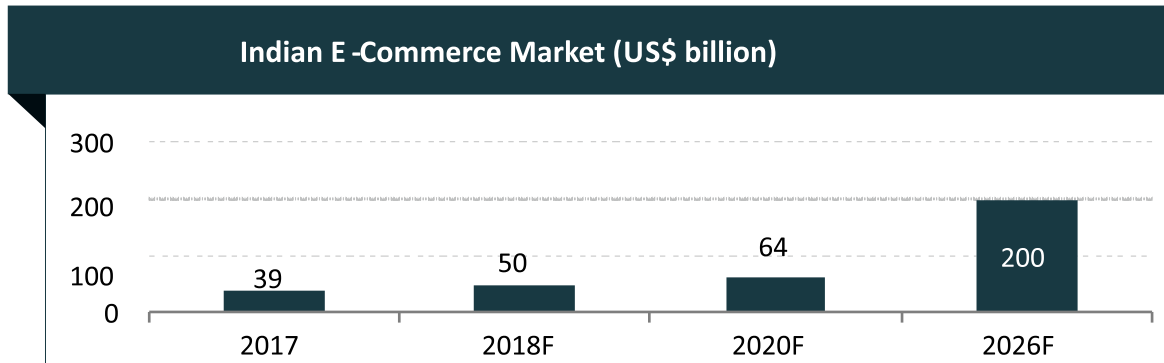
Nowadays, we are witnessing a new era, where e-commerce is booming. “By the year 2034, the Indian e-commerce industry is expected to become the second largest market in the world

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by surpassing the US. According to Research Agency Aranca, by the end of the year 2020, the Indian e-commerce market is expected to reach US \$64 billion from US \$ 39 billion as of 2017 , figure 1

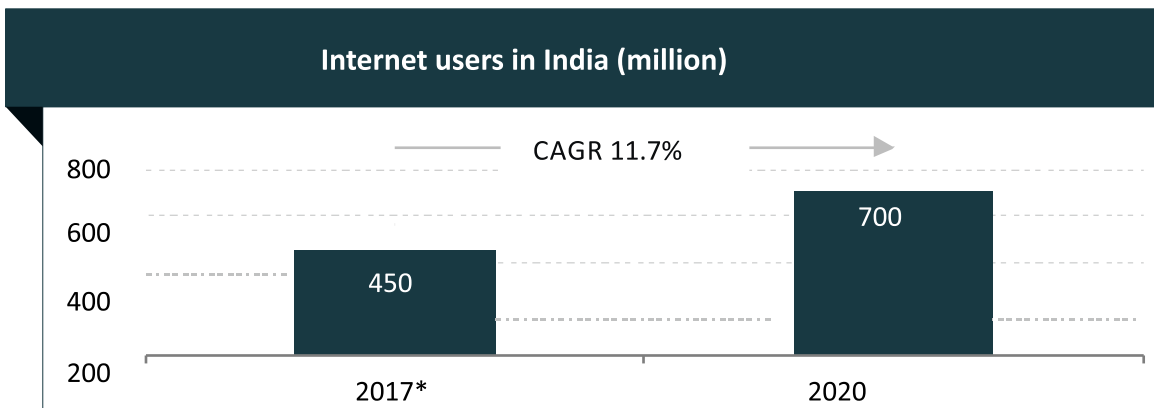
Fig 1 : Indian Ecommerce Market



Source: Media sources, Aranca Research, December 2017

Also with growing internet penetration, internet users in India are expected to increase at a compound annual growth rate (CAGR) of 15.6 per cent from 450 million at the end of 2017* to 700 million by 2020 as shown in figure 2.

Fig 2: Internet users in India



Source: Media sources, Aranca Research, December 2017

The most obvious requirement with online purchasing is that the goods are tangible and need to be stored and transported to the final consumer. The largest impact of e-commerce on logistics service is the increase in last mile delivery with smaller size shipment. The key issue of how to deliver the commodity to consumers in a more reliable and solid way is therefore very important

and it should not be neglected. Besides, the increase in the complexity of transactions and rise in the demand of speedy and accurate deliveries reinforced the need for quality logistics services. The Indian logistics industry which provides employment to more than 22 million people has grown at a compound annual growth rate (CAGR) of 7.8 per cent over the past five years. According to the Economic Survey 2017-18 tabled in Parliament “With the implementation of GST, the Indian logistics market is expected to reach about US \$215 billion in 2020, growing at a CAGR of 10.5 per cent (Government of India, Economic Survey 2017-18)”. “The Indian Express Industry is growing at the rate of around 25% annually and is valued at Rs. 10,000 crores (Express Industry Council of India)”.

2. Research purpose and Statement of the problem

There are many academic researches which have been published about the integration of e-commerce and last mile delivery problems. However, only a few are there who consider about the last mile delivery problem from the perspective of customers.

The authors thought that it is important to conduct research on last mile delivery problems from the perspective of customers in India under the background of growing popularity of online buying. This paper tries to dig out the problems and provide sound suggestions for the third party express couriers in offering required service to customers.

3. Literature Review

This part of the research paper provides the related theoretical knowledge of e-commerce business, last mile delivery service, problems faced by consumers and logistics service providers and the existing solutions available to the LMD problem in developed countries and how it would be the backbone of the e-commerce industry in the times to come.

E-commerce Industry in India

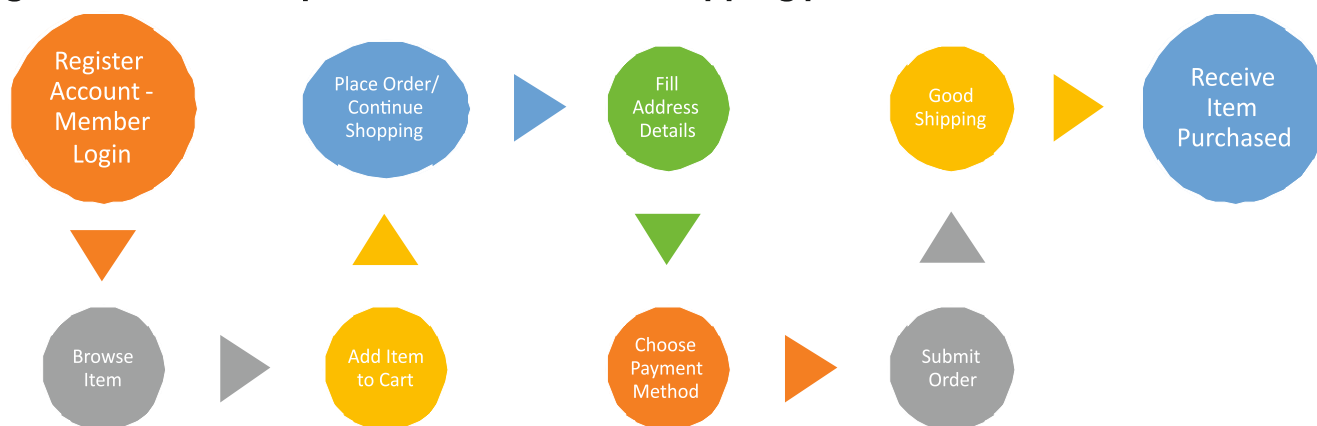
The rapid growing technology of internet has permeated almost every aspect of our life. It is such a powerful tool that has shaped business since it provides unlimited opportunities and options for both companies and customers. E-commerce differs from traditional business in many ways, one of the most distinguished one is that e-commerce makes it much easier to reach global market for various kinds of goods and services with the flexible communication between producers, suppliers and customers. E-commerce can be taken up by almost every possible economic

relationship such as business to business (B2B), business to customer (B2C), customer to customer (C2C). With the increasing consumer wealth, launching of much awaited 4G networks and with the increase in smartphone adoption, the Indian e-commerce market is expected to reach US \$200 billion by 2026 from US \$39 billion as of 2017 (India brand Equity Foundation, Feb 2018). In tier II and tier III cities people have limited access to brands but high aspirations, e-commerce is increasingly attracting those customers day by day. Many established businesses such as Croma, Shoppers Stop, Reliance, Lifestyle, etc. have setup online transaction channels hand in hand with offline trading. Earlier who could have thought of food and grocery as items for online trading. As with the change in time, consumers are opting for adaptability and convenience with the change in working habits, there are now number of small and large e-commerce companies which are selling provisions and food items like Grofers, BigBasket, Amazon Now etc. “Year-on-year India's e-commerce industry's sales rose 40% to reach US \$1.5 billion during the five-day sale period ending September, 2017 (India brand Equity Foundation, Feb 2018)”, backed by huge deals and discounts offered in Flipkart's Big Billion Day, Amazon's The Great Indian Sale and by many other major e-commerce companies.

Online-shopping process

E-commerce is different from traditional business because of its nature of electronics, thus the way it operates is also distinguished from other type of business. A model of online shopping process is given below:

Diagram 1: The descriptive model of online shopping process



Source: Author's own compilation based on literature review.

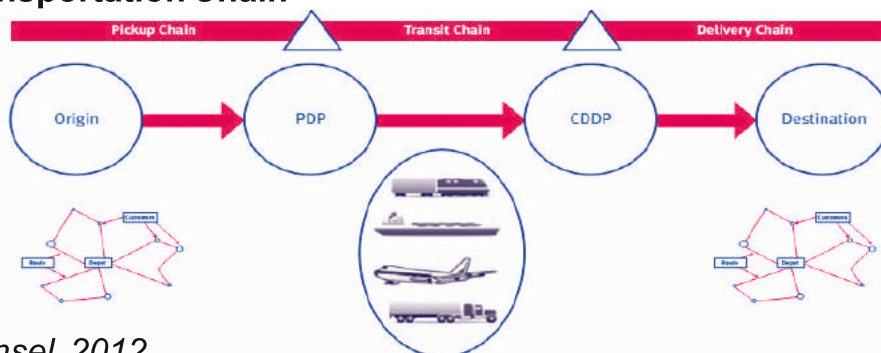
From above diagram 1 it can be seen that the online shopping process is fairly simple. Once the purchase is made, the order fulfillment has large impact on customer satisfaction, which decides whether customers will retain their loyalty or not. Customers are concerned about the delivery schedule and options, handling fees/delivery charges and return services. The transaction might be terminated because of failure on any one of these factors.

One of the reasons behind the ever-increasing trend of online shopping is the value and convenience. Internet provides readily access for consumers to search and compare prices of products. Not like traditional retailing, customers visit shops to purchase; online shopping makes it possible that product is delivered right to your house with just a click of a mouse. Therefore, convenience means the speed and accuracy of product delivery, and the moment customer receives the parcel puts a period to the transaction. This service is very important because it determines whether the expected value can be perceived by customer, and customer puts trust in this process. Living up to the promise of efficient delivery will certainly add value to online shopping experience and it pushes the whole chain into a beneficial circle.

Last mile delivery

LMD is the last phase of delivery that involves the dispatch and shipping of products from the mother hubs/warehouse and to the delivery centers, from there they are shipped out to the customers. Three operating models have emerged to fulfil last mile deliveries. The first consists of parcel logistics providers. Second, small retailers who use 3rd party platforms or existing courier services with the capacity to offer instant or scheduled delivery. And third, large retailers who maintain their own fleet to handle same-day deliveries. The delivery channel of e-commerce can be separated into three parts.

Figure 4: The Transportation Chain



Source: Van Woensel, 2012

As presented in above figure 4, the forward transport chain is divided into three parts. The collection point varies between different parts. Pickup Chain equals to the first stage of order fulfilment, which is responsible for assorting the products from (nearest) warehouse and sending to Pick-up Decoupling Point (PDP). Transit Chain is network of transport and the link of POP and CDDP (Customer Delivery Decoupling Point) however not necessarily all the products are needed to go through the network path (same city delivery). The last mile delivery, means handing over the product to the final customer. It is the only stage that has direct contact with customers and accounts for high cost due to its complexity; therefore last mile delivery is the leading factor in the structure of the transport chain and drives the efficiency of the whole transport chain.

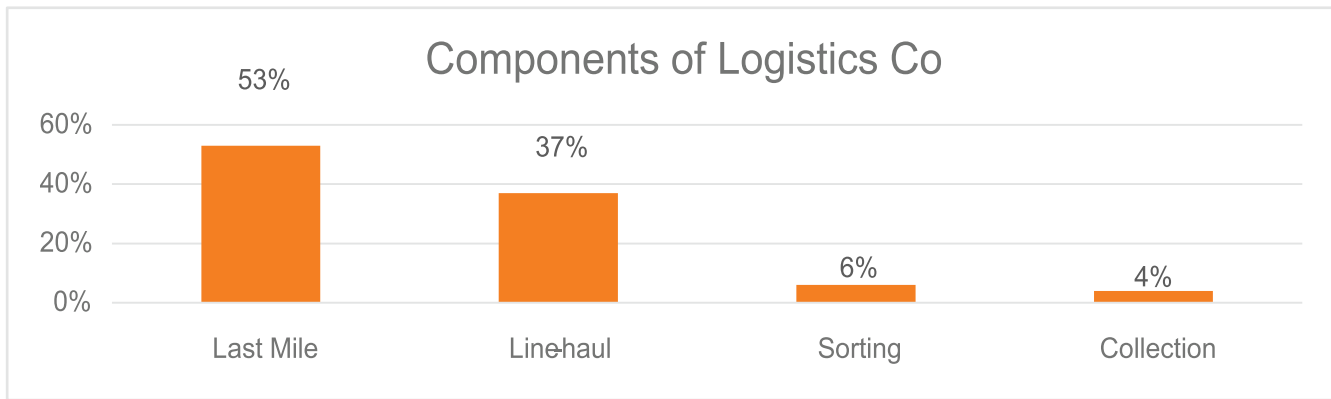
“Day-by-day customers' expectations are rising for fast shipping. Most consider fast shipping to be within two days, while just a year earlier most said it was within three or four days. The consumers' expectations for fast delivery have increased but their willingness to pay extra for the same has fallen down, with 64 percentage of the surveyed customers unwilling to pay anything extra for two-day shipping. And from the customers' point of view whether it is first mile, middle mile or the last mile, for them all are equal. They just want it NOW (Deloitte study, 2016)”.

Last mile delivery is the final stage of a delivery service, which consists of several activities and procedures that are essential from the distribution center to the final receiver. Human force is a key performance for last mile delivery, as a courier boy who brings the product to the door is the only person that a consumer would meet during the whole online shopping service. An online shopping experience could be easily influenced by a poor LMD experience.

Bottlenecks in last mile delivery in India

Although nowadays last mile delivery is highly appreciated by online shopping consumers, there are issues existing in this service, and these issues consequently result in low efficiency and dissatisfaction of customers. Table 1 shows the components of logistics cost and it can be seen that 53% of the total logistics cost comes from last mile delivery.

Table 1: Components of Logistics Cost



Source: https://mettl.com/resources/media/IndiaInternet_Time_to_login.pdf?33.0.6, Last accessed on 19th February 2020.

For consumers, the main issues are that the deliveries are not always on-time; the day on which the product is expected to arrive customer gets a message in the morning that the order is on the way and is expected to be delivered at the end of the day, with no exact delivery window the customers are forced to stay at home entire day to receive the parcel; in the days of free delivery there are still some companies which are charging high delivery rates and the delivery time when the order is placed to when it is received by the customer is too long in some areas, in rural places, hinterlands and some north east areas people have to wait 15-20 days sometime the entire month to receive the parcel, there is still no real time tracking facilities for the parcels which makes customers worry and they have to call customer service of the company to enquire about their parcel which is a time consuming process, returning an online product is also a cumbersome process as many e-commerce companies does not have pickup facility available at customer address and the customer have to courier the product by themselves.

From the view of carriers, they claimed additional cost for repeated delivery; 15-20% of delivery have to be done second time, invalid or incorrect address details, hard to find location, customer not being home to accept delivery, lack of parking space, narrow gullies – the two sides of the lane are filled with houses that are almost stuck to each other and sometimes there comes a cable wire that has clothes hanging on it comes in between the delivery boy and their bike rides, purchaser no longer need the delivery, collecting cash for the COD orders is a cumbersome as well as risky

process, carrying of heavy bag with all the couriers in high rise buildings with no elevators, handling rude customers, doing proper quality checks before accepting the return orders as some customers keep the original products and return the fake product which then after quality check at the company is charged to the delivery boy and the original amount of the product is deducted from their salary, so these are some of the problems faced by the delivery boys. Despite the emergence of several logistics companies in India, deliveries to smaller villages and towns are still a challenge because of the poor infrastructure. Most logistics companies have good connectivity to Tier I, II and III cities. However, their costs increase by INR 200-300 per package to deliver to smaller towns and villages. Traffic congestion in urban areas and the distance in remote areas both add time and cost.

The major factor that affects the successful home delivery operation is 'not-at-home' problem. Most home delivery services inform the consumer a time range on a day that the products will be delivered, but it is this time that most of people are at work or outside. As a result, around 20% of small packages dispatched to customer homes fail to be delivered at first attempt. This long empty window period lead to poor customer services and logistics inefficiencies.

Research Methodology

To answer the established research questions an exploratory study was performed. Multiple methods were used to collect data. Primary data is collected through a survey of online shoppers and secondary data from literature, quality news and published data, to serve strengthening the argument. Quantitative part includes the analysis and interpretation of data obtained from the survey conducted online through surveymonkey.com. The questionnaire was circulated to 200 customers and the number of responses received was 168.

Statistical Software SPSS and MS Excel have been used for the purpose of Data Analysis. Factor analysis has been used to identify the factors that influence the customers' satisfaction levels and impact of LMD on buying decisions in online shopping.

Data Analysis and Findings

The data was collected with the help of a questionnaire. Data analysis showed that 81% of the

customers check the assurance programme of the online retailers before making a purchase decision. Assurance programme's gives quality assurance and a faster delivery to the customer. 54% of customers prefer SMS to receive delivery notification. For 93% customers the last order was delivered on time. Same day or Next day delivery has a 57% impact on customers purchase decision. Customers wants more convenient and faster delivery but most of them are not willing to pay extra. On-door delivery comes out to be most attractive of online shopping followed by reasonable price and free delivery. 72% said that delivery time is most important in their shopping experience. When asked about the problems that customers faced during online shopping, frequently customers were facing the problem of unmatched goods followed by long delivery time. 31% customers cancelled the order because of delay in delivery. Direct home delivery was the most preferred delivery mode for receiving the order.

Most of the customers prefer to receive their order between 4 PM to 8 PM followed by 12 PM to 4 PM. When asked about the overall satisfaction with the current delivery experience, only 28% customers were very satisfied. That means there is lot of scope for improvement.

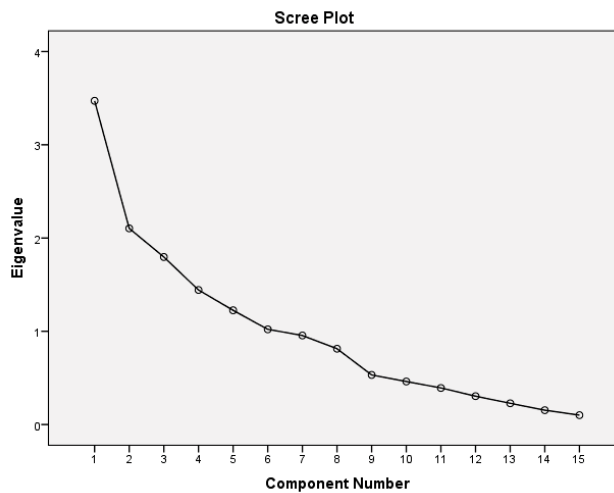
For the purpose of the study Factor Analysis has been used as a statistical tool to identify the factors which are influencing the customers overall experience of online shopping. Factor Analysis also helps in determining the factor loadings. KMO and Bartlett's test is being performed to check the validity of the sample size.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.583
Approx. Chi-Square	333.351
Bartlett's Test of Sphericity Df	105
Sig.	.000

Table 2 shows that with KMO at 0.06, the sample is adequate to undertake the test. P value of Bartlett's test is at 0.000 which is <0.05, hence factor analysis can be undertaken using the dataset.

Chart 1: Scree Plot



Scree plot determines the optimal number of components. It plots the Eigen values of each component which is greater than 1. The point from where the curve changes its direction and becomes horizontal (eigen values less than 1), contribute very little to the variation.

Table 3: Component Matrix

	Component					
	1	2	3	4	5	6
Problem faced in online shopping-untraceable parcel	.911	.161	.139			-.062
Problem faced in online shopping-Damaged Goods	.866	.138	.249	.081		.125
Problem faced in online shopping-long delivery time	.813	.203	.107	-.094	.126	-.262
Problem faced in online shopping-Unmatched goods	.801	.266	.201	.264		.215
Delivery time most important detail in your shopping experience?		.778	-.181	-.128		.057
Customer rating most important detail in your shopping experience?	-.299	.560	.213	.354	-.286	-.361
Payment option is the most important detail	-.365	.492	.243	-.230	.369	.339
Pay extra for a more convenient and faster delivery option?	.161	.122	-.779	.066	-.234	.052

	Component					
	1	2	3	4	5	6
Does the “Same Day Delivery” or the “Next Day Delivery” option makes any Impact on your purchase decision?	-.078	.567	-.579	.106	.162	-.326
Seller rating is the most important detail	-.390	.327	.501	.102	-.345	-.144
Return policy	-.184	-.137	.341	.572	.148	.170
Return Process is the most important detail	-.249	.493	.232	-.522	.105	.255
Cancelled Purchase	-.283	.175	.219	.366	-.050	-.147
Most attractive factor of online shopping for you				.310	.865	-.221
Delivery mode preferred	-.067	.222	-.339	.554	-.061	.587

Extraction Method: Principal Component Analysis.

a. 6 components extracted.

As per Table 3, the Component matrix shows the 6 extracted components. This unrotated component matrix displays the correlation between variables and the extracted components. These correlations are known as factor loadings. The first factor is highly correlated than the second and second factor is more highly correlated to the variables than the third, so on and so forth.

Table 4: Communalities

	Extraction
Delivery time most important detail in your shopping experience?	.659
Customer rating most important detail in your shopping experience?	.786
Seller rating is the most important detail	.660
Payment option is the most important detail	.739
Return Process is the most important detail	.708
Problem faced in online shopping- Unmatched goods	.870
Problem faced in online shopping- long delivery time	.807
Problem faced in online shopping- untraceable parcel	.880
Problem faced in online shopping- Damaged Goods	.855
Cancelled Purchase	.317
Pay extra for a more convenient and faster delivery option?	.709
Does the “Same Day Delivery” or the “Next Day Delivery” option makes any impact on your purchase decision?	.807
Most attractive factor of online shopping for you	.895
Delivery mode preferred	.823
Return policy	.547

Extraction Method: Principal Component Analysis.

Communalities in Table 4 explain the proportion of variance due to common factors and shared by several items.

Table 5: Total Variance Explained

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.471	23.143	23.143	3.213	21.421	21.421
2	2.104	14.024	37.166	1.827	12.183	33.605
3	1.797	11.978	49.145	1.787	11.917	45.521
4	1.443	9.619	58.764	1.732	11.550	57.071
5	1.225	8.166	66.930	1.255	8.370	65.441
6	1.021	6.807	73.737	1.244	8.296	73.737

Extraction Method: Principal Component Analysis.

Total variance table 5 displays the total variance, percentage variance and cumulative percentage variance for both unrotated and rotated components. The cumulative variance of both the parts is 73.74%. For unrotated components, the first component explains the maximum variance, followed by declining variance of the second, third... and sixth component.

Table 6: Rotated Component Matrix

	Component					
	1	2	3	4	5	6
Problem faced in online shopping- untraceable parcel	.912	.055	-.143	-.092	-.123	
Problem faced in online shopping- Damaged Goods	.908	-.105	-.102		.052	-.065
Problem faced in online shopping- Unmatched goods	.894				.262	
Problem faced in online shopping- long delivery time	.814	.156	-.108	-.060	-.303	.114
Does the “Same Day Delivery” or the “Next Day Delivery” option makes any impact on your purchase decision?	-.057	.847	.140	.059		.250
Pay extra for a more convenient and faster delivery option?		.660	-.270	-.264	.283	-.224

Delivery time most important detail in your shopping experience?	.187	.570	.178	.504	.095	.066
Return policy	-.053	-.429	.318	-.107	.388	.312
Customer rating most important detail in your shopping experience?		.248	.848	.066		
Seller rating is the most important detail	-.119	-.161	.720	.221	-.084	-.215
Cancelled Purchase	-.114	-.050	.520		.109	.137
Payment option is the most important detail	-.143		.099	.814	.103	.184
Return Process is the most important detail	-.072			.814	-.132	-.143
Delivery mode preferred		.181			.889	
Most attractive factor of online shopping for you						.944

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization

a. Rotation converged in 7 iterations.

In rotated component matrix, each number represents the partial correlation coefficient between variable and the rotated component. These coefficients help in identifying the components. All the variables that have large factor loadings for a given component define the component.

Factor analysis was done for the data collected with the help of SPSS. Kaiser-Meyer-Olkin Measure and Bartlett's test were performed to judge the sampling adequacy of the data. KMO at 0.06 showed that the sample is adequate to undertake the test. In general, anything above 0.5 is considered acceptable. P value of Bartlett's test came at 0.000 which was <0.05 , hence factor analysis can be undertaken using the dataset. The null hypothesis got rejected since the significance value was below 0.05. Next, the optimal number of components were determined with the help of Scree plot. It is the visual representation of how much the factors explains the variance. In general, we are interested in keeping only those principal components whose eigen values are greater than 1. Components with an eigenvalue of less than 1 account for

less variance than did the original variable (which had a variance of 1), and so are of little use. It showed 6 factors which were above the eigen value of 1 and all other potential factors below the value of 1 were not considered. The satisfaction of the customers from the last mile delivery is depending on various measures. To reduce these various measures to a few principal components, the principal components analysis was used. The Component matrix table contains component loadings, which are the correlations between the variable and the component. Because these are correlations, possible values range from -1 to +1. Component matrix showed the 6 extracted components. The Communalities table explains the proportion of variance due to common factors and shared by several items. It showed that home delivery was most important variance factor for the customer satisfaction.

On the basis of the data analysis it can be highlighted that the components of LMD that have an impact on the customer's satisfaction in online purchase are:

- 1) Problems like long delivery time, unmatched goods, and untraceable parcels
- 2) Customers shopping experience in terms of delivery time, sellers rating, and customer rating
- 3) Availability of same day delivery as an option
- 4) Ease of payment
- 5) Availability of return process in case of some issue
- 6) On door delivery being the most attractive factor of online shopping

The results of Principal Component Analysis reveal that last mile delivery is an important factor in enhancing the overall customer satisfaction for a customer buying products online.

Future Scope and Limitations

Appropriate care has been taken to conduct a thorough research. Possibility however remains that some articles on the topic might have been missed out accidentally while conducting literature review. Since the coverage has been exhaustive, it is hoped that possible omissions would not significantly alter the review and conclusion. This study mainly considers the impact of last mile delivery on the ecommerce industry from the customer's perspective. There may be other critical factors that influence the performance of the industry that should be considered in

future studies. The survey for the purpose of the study was done based on 168 responses in different age groups of respondents. Ensuring a better and unbiased response is difficult in the present situation as the Indian ecommerce industry market is fragmented with a handful of serious players. Future studies may look into the issue of delivery density, crowd sourcing, last mile logistics innovation and dynamic dispatch trade-offs.

Conclusion

E-commerce is the future; it is changing the traditional ways of doing business. And consumers love it as they get abundant of products to choose from at reasonable price with convenience of a home. Anything young people love, it has the future.

Customer loyalty is won and lost in how well the orders are fulfilled and delivered. Last mile delivery plays a crucial role here for the success of any e-commerce company. Last mile delivery is the only phase that has direct contact with customers in e-commerce, not only accounts for a large cost due to its complexity, but also has influence on the experience of online shopping. A company's shipping service can "make or break a retailer". Speed is the game in today's business. Customers don't want to wait for their products to be delivered, they want it NOW, and once they have ordered something online they expect it to be delivered as quickly as possible.

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Reflecting on Supreme Intelligence through Bhagwad Gita in the Era of Artificial Intelligence

Dr Rajendra Kumar

Scientists and technologists utilize observations with sense organs, mainly eyes with the help of telescopes, microscopes, electronics, complicate sophisticated modern equipments and making models using brainpower, checking whether these models agree with the observations and corroborate by other scientific studies. Eastern religions in particular Hinduism and Buddhism do not have any problem with science what so ever. Although both science and religion have limitations but still both are useful for the good of mankind.

It is felt that Hinduism is the most misunderstood religion in the west. Its real name is “Sanatan Dharam”, meaning universal duty, responsibility, or a prescribed way. The abstract knowledge originates from “Vedas, Upnishads and Bhagwad Gita”. Hindu or Sanatan religion did not originate from one prophet, but a large number of sages, philosophers from time immemorial have contributed to the vast knowledge compiled in well-documented scriptures, a legacy of generations. According to Hindu (Sanatan Dharam) philosophy, God is not like a king emperor who created the universe and rules arbitrarily from outside but it is an all-pervading eternal entity. God is supposed to be present in every living and nonliving matter i.e. in every single particle of the universe and it would be synonymous with the laws of nature. It points towards a formless and shapeless, omnipresent, omniscient entity known as Brahm.

Eventual facts can be judged with the help of three proofs viz: (1) Evidence as perceived by sense i.e. 'Pratyaksh Praman' (2) Estimation by experience i.e. 'Anuman Praman' and (3) Through wisdom imparted by learned persons via revered ancient scriptures 'Agam or Shastra Praman'. Mostly Hindu scriptures reveal the wisdom in abstract forms e.g. shlokas, sutras, Vedic hymns, which are not easily understood and need further discrimination and explanation by learned persons. For example Human eyes can perceive light spectrum from violet to red color, only a limited portion of a vast spectrum of electromagnetic waves starting from X- rays to microwaves and radio waves. Although these invisible waves are of tremendous utility in emerging modern technologies, indicate the possibility of the existence of an entity beyond our senses, which were

revealed by 'Scientific Evidence or Pratyaksh Pramans' that too only a couple of centuries ago. There may be similar other aspects also, which still are beyond our cognition.

In the initial stages, a science student is initialized that light has dual nature of both the harmonic wave (Huygen's theory) as well as corpuscle by classical Physics model (later called a photon, an energy particle) travelling through a hypothetical medium called 'Aether', prevalent everywhere and these concepts also have been confirmed experimentally. Similarly elementary particles like electron, protons, and neutrons etc., the building blocks of materials cannot be confined in a particular spot and exhibit wave nature too vide quantum mechanics. It seems as if the founder scientists of modern Physics like Schrodinger, Heisenberg, de Broglie, and Bohr were familiar with Hindu scriptures.

More than five thousands years ago Lord Krishna preached 'Bhagwad Gita' to his pupil Arjuna in the battlefield of Kurukshetra (Haryana), to remove his ignorance and motivated to follow the righteous path. Here an effort has been made to quote relevant Bhagwad Gita verses, originally in Sanskrit but English version taken from 'Gita as it is', written by Swamy Prabhu Paad (ISCON). It elucidates that the whole universe is the manifestation of super consciousness (Super soul), unfolding itself into a panorama of limitless system, all interconnected with each other. According to 'Vishisht Advaita' philosophical theory by Ramanuj Acharya 1017-1137 ') soul and matter are not considered quite separately (B.G. 7: 5 & 6). The vital living force i.e. soul exists in all domains of inanimate (matter), semi-animate (plants, trees), and the animate world and extended even beyond our perception.

B.G. 7:5 &6 Besides this inferior nature, O mighty-armed Arjuna, there is a superior energy of Mine, which are all living entities who are struggling with material nature and are sustaining the universe.

Of all that is material and all that is spiritual in this world, know for certain that I am both its origin and dissolution.

The universe can be postulated as an amalgamation of lifeless material called "Apara, non-

moving nature” and “Para, live nature. It can also be visualized (vide computer age analogy) as if the super soul with supreme intelligence is controlling the whole universe, through the soul and hardware of available worldly materials, depicted as following (B.G.13: 6, 7 & 27)

A. Super soul with supreme intelligence	
B.Soul with 1.Intelligence 2. Emotional Intelligence 3. Intuition	
C. Hardware of physical world	
1. Mind, Intellect, Chitta (Subconscious mind, Mool Prakriti), Ego.	-----4
2. Senses : vision, sound, taste, smell, touch	-----5
3. Sensing organs: eyes, ears, tongue, nose, skin.	-----5
4. Acting organs: hands, legs, mouth, excreting and urinating organs	-----5
5. Basic materials (Maha bhoot): Earth, water, fire, air, space (Aakash)	-----5
Total	24

B.G. 13:6&7. The five great elements, false ego, intelligence, the unmanifested, the Ten senses, the mind, the five sense objects, desire, hatred, happiness, distress, the aggregate, the life symptoms, and convictions-all these are considered in summary, to be the field of activities and its interactions.

B.G. 13:27. O chief of the Bharatas, whatever you see in existence, both moving and non- moving, is only the combination of the field of activities and the knower of the field.

It may be emphasized that hierarchy wise the most subtle and powerful entity is occupying the top place top in the above table. In the case of living creatures, it is observed that the all-pervading super soul (Parmatma) amalgamates the materialistic hardware of 24 physical characters and their respective soul. It may be inferred that the interaction of hardware (materials) and programming by soul with intelligence, is the cause of the origin and development of the world. The evolution of life starts from a single cell, amoeba, virus, and bacteria to further complex species of having with or without vertebra, having different genes, genomes, DNA's, senses, and intellect of varying magnitudes.

Soul (Chetan Prakriti) is prevalent everywhere in inanimate as well as animate beings (B.G. 9:6). The birth of all the beings takes place as per a blueprint having a basic structural pattern, repetition, variation, and sustainability (Due to their 'mool prakriti' B.G.14:3). The mool prakriti has been divided into three quality-wise categories i.e. (I) Satvik –Bright and best desirable quality and elevating nature. (II) Rajsik—Average quality, floating nature. (III) Tamsik—Dark, low, and least desirable quality, sinking nature.

B.G. 9:6 As the mighty wind, blowing everywhere, always rests in the real space, know that in the same manner all beings rest in Me.

B.G. 14:3 The total material substance, called Brahman, is the source of birth, and it is that Brahman that I impregnate, making possible the births of all living beings, O son of Bharata.

The super soul with supreme intelligence develops the universe with self-executing unique programming, endowed with the self-governing orderly balance of growth, sustenance, and even its destruction as well. The development of human species takes place by gradual upward movement from least desirable darkness (Tamsik, lack of knowledge) towards the most desirable bright (Satvik, full of knowledge). The soul starts its journey from birth in a particular situation depending upon the past Karmas, imprinted in the subconscious mind (CHIT). All the past life's cause and effects (Karmas) at the time of death, are carried over by the soul in the new birth (B. G 8:6).

B.G. 8:6 Whatever state of being one remembers when he quits his body, that state he will attain without fail.

It is worth mentioning that the development of any traits, state of matter, their structural pattern, senses, sensual exposure, capability does not occur abruptly, but in an infinitesimally small graded manner. In the realm of the material world, the minerals are found in large quantities in the shape of mines in different parts of the globe. This is due to the well-known fact that nature multiplies itself on its own. Similar quality is also observed in the vegetation regime where a tree or plant produces seeds in large numbers and multiplies automatically in various ways using air, water, or other means of pollination at proper weather, sowing period, etc. The botanical world

also is known to have life having a limited number of senses e.g. touch, directional growth. Even certain botanical species are found to be carnivorous in African forests.

In the modern age of robotics the emergence of artificial intelligence for various fields of automation, medical, transportation, avionics, and even in electronic warfare, suitable algorithms for machine learning are developed. When human beings can use artificial intelligence to devise machines capable of learning and equipped with senses and follow their commands; then they can also intelligently program/ orient their thoughts, actions, words and follow the paths illustrated by the scriptures (Agam Pramans). Keeping in the view the welfare of the human race, enlightened prophets, Godmen, and Gurus acquired knowledge through intuition and penance. Their interpretation and preaching always has been a guiding source to maintain peace and order in the world. The beneficial disciplines already have been professed in Bhagwad Gita, so that anybody should reform or orient his intellect to attain the most desirable virtues and attain detachment and liberation from rebirth full of sorrows.

An Investigation on Mobile Security Problems

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ABSTRACT

In the present age of science, our technology is changing day by day dramatically. Mobile phones especially smart phone has become an integral part of our day to day life. Due to the vital use of internet-based smartphones, we have given an easy access to our personal or work-related information to outsiders. If we talk about the mostly used Android phone, it has a minor concern about the system security for end users. To improve the security, our first goal is to eliminate these security breaches so that we can have a seamless experience and need not to worry about such problems. In our study, we tried to address the security problems encountered with smartphones & mobiles and safety measures to overcome these. Our paper also covers a brief description about the issues of risk related to security violation of various operating system used in smart phones and throws light in the areas need to be improved for the better security. We have also tried to clarify the working procedure of wireless system, the tactics used by the hackers to attack and the preventive measure that can be used for safety. Finally, we have suggested an additional layer security over single layer security for authentication such as password, pattern lock, PIN, biometric systems including iris scan and fingerprint etc.

KEYWORDS: Mobile Security, Privacy, Wireless, Android, IOS, Smart phones.

INTRODUCTION

Organizations rely heavily on mobile technology; Therefore, mobile security issues have become more important today. Nevertheless, security is negligible. The issue of security of equipment has become a matter of concern and lack of research in this domain is also worrisome. Originally Android is the most commonly used operating system, they are used in many places such as TVs, watches, cars, to name a few, the main reason for Android's popularity is due to its open source code license. The Play Store has more than 2.1 million apps, but the apps that have to be checked never have security. The following paper demonstrates how multilevel security is needed in this advancing world, as we need to maintain our privacy (which may include our bank details or our crypto-currency details or even basic identification details) and have to have a

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great access to the web from our phones at the same time. According to the findings of this research, additional layer security is required for currently in use single layer. Also, there is a need for accurate, fast and reliable methods for authentication which can include password, pattern lock and PIN besides biometric systems such as iris scan, fingerprint etc.

RELATED WORK

Cell phones have turned into the most widely recognized methods for correspondence throughout the world. According to the most recent measurement distributed by the Central Intelligence Agency (CIA), in 2011 there were 6 billion portable members worldwide, out of a total population of about 7 billion individuals.

With the accelerated evolution of technology, cracks in the framework security and incidents of exchange misrepresentation are increasing. Therefore, a deeply secure confirmation framework needs to be built. The increased use of cell phones to store a lot of information suggests a threat of misfortune or robbery, which can turn off data security. This trade of security is particularly dangerous when fragile personal data is involved. The current verification strategy to protect portable gadgets relies on the use of a personal identification number (PIN) to confirm the customer. Along these lines, more advanced security is required, especially with the improvement of cell phone gadgets. Current cell phones give a heap of customary (PC) capabilities and provide an adequate determination of the available options, for example, IEEE 802.11, Bluetooth, GSM, GPRS, UMTS. And HSPA. A lot of attractive highlights have inspired the far-reaching proliferation of cell phones, which, later becomes the focus of attackers. During the beginning, cell phones came bundled with the institutional functioning framework (OS): the low diversity in the OS caused attackers to misuse enormous number of gadgets of many types, causing significant security flare-ups. Threats for smart phones include:

- 1.Data leak
- 2.Unintentional disclosure of data attacks on unauthorized devices
- 3.Phishing attacks
- 4.Spyware attacks
5. Network spoofing attacks.
6. Surveillance attacks

7. Dialerware attacks

8. Attacks of financial malware.

9. Work rush

Portable security is the protection of versatile gadgets, such as cell phones, tablets, or workstations. In any case of the gadget's threats, it ultimately affects customers only. The threats may include malware, listening, going unpublished, gadget theft etc. The 2013 annual report, Organization Number, states that a 42% increase in targeted attacks has been countered. This growth in digital devices makes versatile security extremely important, as well as highly defensive, with an increased offering of convenient gadgets.

Most apps behave like bots on a computer i.e. like a swarm. Therefore, the mechanism adopted to recognize bot will be irrelevant for mobile devices. Since 2009, there have been 230,000 open source forge mobile software developments and some issues have not gone unnoticed such as cloned applications. While there is no data yet on how Android apps are being used as an assault vector for repackaging, the current report shows little insight into the security issue. Android applications like Java are straightforward to detect, so the concern for "fake" Android programs is the interesting issue for security.

MOBILE SECURITY REQUIREMENTS

Before we go deeper into the issues, let's look at some basic terminology. What is Hacking, Cracking, Malware and Cybercrime. According to an article written by Margaret Rouse, a cracker is "someone who sneaks into someone else's computer system, often on a network, bypasses passwords or licenses in computer programs, or in other ways intentionally breaches computer security." Cybercrime is a crime that involves the Internet, a computer system, or computer technology". Cybercriminal is one who is involved with cybercrime. Malware is defined as any software that gets installed on your device, performs unexpected tasks, often for the benefit of some third party. There are some types of malware that annoy the user or steal information. These programs are known as adware and spyware. Adware is software that is supported and enriched by a program or company to display advertisements while you are online. Spyware Software is one that collects information from your computer and sends it to others who want this

information. It includes bank details, the product you want to buy, customers, history, personal data, IP address etc. There are two important points for attacking vectors in cell phones. The first point is where the cell phone gets connected with the internet, the second point is where the cell phone gets connected with a system.

In the framework, there are two huge information security threats as below:

A.) Loss of cell phones can increase the misuse of business information and personal data which is already stored in these gadgets.

B.) Classifying information block effort between broadcasts would represent a risk for access to information. On the occasion that hackers turned, masked, re-repeated information or influenced the server to deny information on behalf of the customer, rural content vendors would face a terrible misfortune.

A versatile security system can be developed for associations by bringing the system framework design together. They can also bring together remote systems, wired systems and VPNs. With the help of this, all the system will be screened more clearly for any security threat. Similarly, if they were decentralized, they would be able to identify the risk early. They can conduct performance tests using ethical hackers. In addition, the transport layer can be combined with PKI (Public Key Infrastructure) to ensure that it is confirmed and approved. Also, introducing such programming will help in the fight against SMS / MMS interlocks.

Security Essentials:

Since mobile cloud computing is a combination of versatile processing and distributed computing, security threats in portable computing are derived from distributed computing.

- In portable distributed computing, the customer doesn't know where his information is stored, so practically the customer has no right over this information.
- A customer with ill anticipation may put a phishing attack infection in a cloud server that can trade information from different customers and the cloud supplier will be unable to track this in view of the organization's security strategy.
- Holes in the security of the interface using cloud administration can prevent attacks like sidestep attacks of API attacks.

- When the cloud supplier benefits various clients, inconsistencies in encryption computation may prevent access to one's information.

Like traditional systems, the objectives of securing portable registration can be used alongside features: access, privacy, clarity, reality, and non-clutter. By judging on these parameters, it was found that there are issues with lot of applications, the applications named in the list were removed by Google because they lacked these characteristics, more than 100 applications were removed within the last 2 months. Some examples are:

Confidentiality: This ensures that the transmitted data must be received by the planned beneficiaries and never disclose inappropriate elements. Apps removed due to this problem: Universal TV Remote, USA TV 50,000, South Africa TV, Italia TV, SPORT Tv1.

- **Availability:** Ensures that the proposed system administration is accessible to the proposed parties when necessary.
- **Authenticity:** Allows a customer to guarantee the character of the element with which he is speaking. Without verification, an enemy can disguise an actual customer, increasing inappropriate access to assets along these lines, which make the data, and tangible, with the task of the customer. Removed Apps: Neon Pong, take a Trip, Join Up, Just Torchlight, Photo Editor Collage 1, Prado Parking City and Real Drone Simulator.
- **Integrity:** This guarantees that data is never tainted between transmissions. Simply accepted gatherings are ready to accommodate this. Removed Apps: Movies Stickers, Hearts, Prado Cars, Offer Extreme, American Muscle Cars.
- **On-repudiation:** This ensures that a substance can display transmission or data gathering by another element, that is, a sender cannot deny dishonesty or send some information.

These applications are just a few of the many instances Google removes on a daily basis, which could also be due to a lack of privacy or the presence of a malware / adware. These issues were reported to Google by security researchers at Trend Micro and Sophos, which are well-versed in security research.

MOBILE SECURITY ISSUES

Basic levels of problems include:

- * Malicious Applications
- * Insecure website
- * Data protection of mobile devices
- * Network data security of mobile devices.

Other main problems are:

- 1.Data may include username, password, authentication data, area administration information. Personal data (DOB, social security numbers, addresses, visas and monetary data).
- 2.Frill Server-Side Control in Outsider applications: This is the responsibility of the application designers. Every application should have security gauges for unauthorized access to the server or application database.
- 3.Poor Approval and Confirmation: The use of valid verification will help differentiate inappropriate code, clear or block customers or programming.
- 4.Password insurance is unrecoverable: Some gadgets do not have tight secret security programming.
- 5.Wireless transmission is not secure or encoded: Portable gadgets interface is open and private systems. Open systems is more often than not be encoded so that they will not constrained Customers in particular.
- 6.Lack of security programming for some working frameworks: As in the Bluetooth framework, a gadget is portrayed in one of three classifications: trusted / unbelievable gadgets, verified / unauthenticated gadgets, and obscure gadgets
- 7.Outdated Security Programming: If the product is not ready and its database is out of date and has not been revived. The product will not isolate new malware attacks. The gadget's helplessness will be at its lowest point for security.
- 8.Outdated OS: Customary updates to the OS are generally security related to bug fixes and refreshes. In the event that the structure was outdated, lawbreakers can access it simply and therefore can effectively attack over it.
- 9.Unauthorized change "jailbreak" or "install": Doing along these lines will change part of the application and give it an official suitability to change and adjust the outline. This means that it had allowed an authority to go out of this world and manage it. Verification has changed, attackers

cannot put too much pressure on the gadget by playing with installed applications.

10. Malware attacks: Malware can accomplish a harmful programming, a serious prank for cell phones. Start with SMS Message spam, spam ads, fake telephone calls, client cost calls and on the exchanges, the Exposition Exchange to control or close the entire gadget. Malware is dangerous and the damage that can occur :

- Denial of administration attacks: When the system becomes inaccessible to gadgets and clients in the light of an apparently illegal attack.
- Unauthorized access: when malware consents to unsuspecting customers for signing into a system and its assets.
- Excuse: When a maleist programming enters a system or gadget as permitted programming. Put a wrapper to work as it was and this is a real application with similar behavior. Retaliatory programming takes on the personality of another expert and likes it.
- Eavesdropping: Eavesdropping occurs when a secret contains a convergence or encoded correspondence between two sources.
- Changes: In the "NIST Report of Mobile Agent Security", manufacturers clarify adjustments as changes made to the product or code. As an expert can visit certain stages during his lifetime under various security areas, components must be installed to guarantee the operator's code, state, and information reliability. "

Mobile device threats are classified here as one of four classes: hardware-focused attacks, device-independent attacks, software-focused attacks, user layer attacks.

For these attack vectors, separate attack models have to be considered. Attack vectors investigate vulnerabilities of the sufferer side, and attack models hinder the capability of an attacker. To differentiate, passive attackers do not sent content activate while the active attackers do. Both types of attackers can have the following goals: Ever dropping, availability attacks, privacy attacks, and impersonation attacks.

One of the ways to increase cell phone security is through a two-advance verification framework.

Two stage authentication includes:

A) OTP Algorithm: With a specific end goal to secure the framework, the OTP produced must be difficult to figure out, retrieve, or follow by the programmer. In this manner, it is mandatory to

construct a secure OTP. It should be present at both the ends of the server and the user and create similar security patterns. In recent times, all these methods are used:

- **IMEI Number:** The International Mobile Device Identification Number is a unique number for a device and its user.
- **IMSI Number:** International Mobile Subscriber Identity is a unique number assigned to all GSM and Universal Mobile Telecom Systems (UMTS). It should be placed in the Subscriber Identity Module (SIM) card in mobile devices which can bear the SIM card.
- **Username:** However, it is never necessary on the basis that IMEI will identify the customer exceptionally at any rate. **PIN:** A personal identification number is used with any device to know whether the user is generating OTP, or is known by the username itself.
- Voice based
- Lip reading
- Image based

These guarantee perfect time synchronization between the two parties. For example, in most OTP calculations the above elements are linked and the result is a hashed using SHA-256 that restores the 256 fragments message. The message is then XOR-ed with the PIN redrawn for 256 characters. The result is then Base64 encoded which returns a 28-character message. The process results in a cryptic word that is used for the moment that is only for one user. The result is far more secure for the user, as the user must enter each character into the site or ATM. Short OTP messages are user friendly but can be exploited by hackers.

B) Customer design: For a two-way advance confirmation system, information transmission, a 256-piece symmetric key is encoded for OTP computation and sent to the server.

Information security and other security issues are acclaimed for valid codes for cell phones. There are many possibilities to get or take information about cell phones . An unsuspecting person can undoubtedly obtain data held on a cell phone. The best portable hazards that affect security are:

- Misfortune of data from lost / stolen gadgets.
- Taking information through portable malware.

- Data leakage through inadequately created external applications.
- Weaknesses in gadgets, OS, planning and external applications.
- Insecure systems are focused on and have arbitrary access.
- Unsecured or stray commercial centers.
- Inadequate administration evaluation, capacity and API access.

IMPORTANT OVERVIEW

The following comprehensive observations were seen:

1. Misuse of privacy sensitive information, especially of phone identifiers and geographical location. IMEI, ICC-ID and IMSI were some Phone identifiers used for everything from the number of "cookie-esque" tracking accounts.
2. There is no evidence of misuse of telephony, background recording of audio or video, unmannerly connections, or harvesting of a list of installed applications.
3. Advertising and Analysis Network libraries are unified with 51% of applications studied, including Ad Mob and Google ads are dominating.
4. An exploitative vulnerability that can lead to malicious control of the phone.
 - Following the third-party client and access to delicate Android authorities.
 - Malware inflation.
 - Traffic Interference Mode.
 - (Lacking) spreads encryption and movement.
 - In-way middlemen and activity control.
 - TLC capture attempt.

The results show that regardless of the guarantee of security, security and privacy made up the major part of VPN applications, a huge number of customers could be rendered unconscious which ensures poor security and the harsh behaviour spread by VPN application.

For safe practices, it may be noted :

I. Android

- o Set a device password
- Path: Settings> Location and security> Set screen and password.
- o Deactivate Unknown Sources for Application

- Installation
 - o Path: Settings> Applications> Unknown
- Sources.
 - o Review application permission.
 - o System updates from time to time.
- Path: Settings> About phone> System update>
- Check for updates.
 - o Turn off wireless features (GPS, Bluetooth, WiFi, and portable hotspots) when not using
- Path: Settings> Location and Security
- Settings> Wireless & Network>
- Wi-Fi Settings> Wireless & Network> Bluetooth Backup data on device
- Path: Settings> Accounts and sync> My data backup> Time (weekly / monthly)
 - o Turn off Google Places.
 - o Do not root the device.
 - o Web Security Awareness.
 - o Antivirus for scanning unknown sources.

II. iOS

- Complex device passwords.
- Path: Settings> General> Password / Pin code.
- Use different passwords.
- Enable Find My iPhone.
- Path: Settings> Location> Find.
- Turn on data wipe.
- Path: Settings> General> Password Limit.
- Turn off Auto Join Wi-Fi.
- Short auto lock time.
- Path: Settings> General> Autolock. Turn off location service
- Do not overuse iCloud.
- Minimize lock screen notifications.

Therefore, these various steps can be taken to remain protected in both OSES, these steps can minimize the chances of any major issue by 70%.

CONCLUSIONS

The paper concludes that to avoid safety breach issues, advanced methods should be adopted at the following levels:

- Biometric system at user level it should be a fingerprint scan or iris scan, voice recognition should be used; Along with this, the user should also be taught about such maliciousness to protect himself.
- At the OS level or software developer, who can develop targeted security protections in smartphones, companies should take care of their user so that bio-metric-like authentication is better experienced; In addition to PIN, password and pattern and knock code. They should also increase accuracy and anti-malware protection systems to prevent tracing, redirection, and theft of personal information.
- At the device manufacturer level, update the device automatically so that attackers can't take advantage of it.
- Exploitation of security ends will be difficult.
- At the network operator level, it can augment the network infrastructure with mechanisms to avoid intrusion.
- At the level of the antivirus database, new epidemiological models given for prediction if already known viruses can trigger an epidemic.

Much more advanced methods should be used at the level of data transfer via wireless systems so that no breaches occur and data jamming and end to end encryption are maintained, making the IPv6 protocol standard with SSL encryption . Physical - layer which is cool new innovation should be used. Multilevel protection should be used simultaneously to prevent risks. In addition, data should be monitored timely for suspicious activity but without compromising user data.

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3. All tables, charts and graphs should be prepared on separate sheets. Those should be numbered continuously in Arabic numerals as referred to in the text. Where necessary, the source should be indicated at the bottom. Number and complexity of such exhibits should be as low as possible. All charts and graphs should be drawn cleanly and legibly. Tables and figures should contain self-explanatory titles. Footnotes, italics, and quotes should be kept to the minimum.
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 - The purpose and prospective readers for whom the articles have been targeted.
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Book : Porter, Michael E, (1985) *Competitive Advantage : Creating and Sustaining Superior Performance*, The Free Press, New York.

Journal : Dunphy, D.C. & Stace, D.A. (1998), 'Transformational and Coercive Strategies for Planned organizational Change : Beyond the OD Model', *Organizational Studies*, Vol 19, No. 3, pp.317-34.
7. No full stop after abbreviations (UK, USA, MBBS, MBA etc.) Use full stops after initials (K.P. Singh)
8. Use double quotes throughout. The use of single quotes to be restricted for use within double quotes e.g. "In the words of Churchill. 'Any one can suggest you when you are right; friends are there to support you when you are wrong'"

Quotations in excess of 50 words should be separated from the text with a line space above and below and indented on the left. Quotes should be cited accurately, from the original source, should not be edited and should give the page numbers of the original publications.



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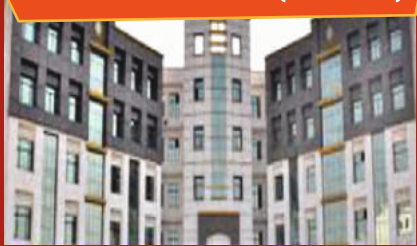
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