Conflict Resolution Strategies in Channels

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Abstract

With the advent of the e-commerce channels, most manufacturers have introduced direct internet channels which could be a source of conflict among channel members. The conflict could be task related or interpersonal and can occur at any stage of the relationship with the manufacturer-honeymoon, routine problem solving or stabilization. Depending upon the type of conflict and relationship stage, propositions are developed for conflict resolution strategies.

Keywords: *Conflict, conflict resolution, channel lifecycle, internet channel*

For any company with a product to sell, how to make that product available to the intended customers can be as crucial a strategic issue as developing the product itself. Choice of channels is a crucial decision for any manufacturer. Today there is a growth in technology and internet channel options making the choice much more strategic for the manufacturer. However, the greatest threat to the addition of direct internet channels is the threat of conflict from other channel members. Conflict is a multidimensional and can be classified into different types based on the source of conflict. Since most channel setups are over an extended period of time, there is a relationship that develops over time between channel members. In this paper, an attempt has been made to understand the two types of conflict that could arise because of the internet channel addition and the various stages of the channel relationship that it could arise in. Based on this, conflict resolution strategies have been developed for each situation. This research looks at how the type of conflict and relationship stage could influence the channel resolution strategy which has not been studied before. The paper is organized as follows. The first section comprises of a literature review on conflict, conflict due to addition of internet channels, conflict resolution strategies and channel relationships. Based on the literature review, a set of propositions are developed, followed by a discussion on research implications.

Conflict

Conflict in channels is a topic of research in various fields like psychology, organizational behavior and sociology. Conflict occurs when parties disagree over substantive issues or when emotional antagonism creates friction between parties. Conflict at times can be good for teams as it leads to increased creativity and better performance outputs. However, conflict that is dysfunctional must be reduced or eliminated. There is work in channels literature on **conflict and power** as key constructs influencing distribution decisions and channel structure (e.g., Mallen, 1963, Rosenberg and Stern, 1970; 1971, Lusch, 1976; Dant and Schul, 1992; Hibbard, Kumar, and Stern, 2001). A channel conflict can be defined as "a situation in which one channel member perceives another channel member to be engaged in behavior that is preventing or impeding him from achieving his goals" (Stern and El Ansary, 1977, p. 283 reported by Gaski, 1984). If a channel member's actions are viewed as impeding another channel member's goals, conflict will increase.

On the other hand, if a channel member's actions are seen to facilitate the achievement of another member's goals, conflict will decrease. Conflict not only helps define a relationship, but it helps to stimulate a genuine concern or interest in preserving the relationship.

Addition of Internet Channel

The internet channel is different from other direct and indirect channel of the firms. Internet channels have advantage over the other channels in several aspects. It can **(1)** increase revenue for the company by increasing reach to a more global market, **(2)** reduce costs by bypassing traditional distribution channels, and cutting transaction costs and commissions and **(3)** enhances customer service as it provides more and better information with multimedia (Olsen and Moore, 1998). It is more popular among the younger generation, relatively inexpensive for the manufacturer to set up. Due to its increased popularity, the perception of conflict by other channel members could also be high. In today's world, with the advent of E-commerce, manufacturers face a dilemma. If they do not sell their products directly over the Internet, people will go to their competitors who do, while if they do sell your products directly, their distributors and dealers will desert them and only carry products from manufacturers who do not compete with them. We have seen cases such as Wal-Mart and Home Depot warning Black & Decker that they would take its products off their shelves should Black &Decker start selling its products through the Internet. Similarly, Gibson Musical faces strong resistance from its intermediaries when it started selling its products online at 10% discount and had to back away from its disintermediation efforts. In a survey of 50 manufacturers, 66% indicated channel conflict was the biggest issue they faced in their online sales strategy, three times as many as the second most frequent response. Channel conflict is thus a serious concern for companies as they add e-commerce (Webb, 2011).

Conflict can occur when resellers have not been considered in e-commerce plans. Disintermediation is a process when intermediaries are cut out of channels (e.g. Jevons and Gabbott, 2000). This often occurs with the introduction of internet channels. According to Frazier (1999) manufacturers using a highly selective distribution channel in which the dependence and investment in intermediaries is high, should avoid the use of the Internet for e-commerce as it would otherwise lead to conflict.

Stages of Conflict and Conflict Resolution Strategies

In a seminal article on conflict, Pondy (1967) identifies five stages of a conflict episode: latent, perceived, felt, manifest, and aftermath. According to Thomas (1992), a channel member's perceptions of another member's actions will be based on normative (fairness), rational/instrumental (benefits), and emotional reasoning (bonding). Sashi (2009) builds on Thomas(1992)'s work and looks at how conflict perceptions based on normative, rational/instrumental, and emotional reasoning affect relational norms, how relational norms affect conflict resolution strategies, and how the conflict resolution strategies affect marketing channel relationships. A channel member's perceptions of conflict will influence changes in the relational norms that characterize its relationship with other channel members. Depending on how the relational norms change, the conflict resolution strategies of the members will vary. The strategies

used by the parties to resolve conflict will either improve or reduce the quality of the relationship among channel members.

Bradford, String fellow, and Weitz (2004) consider two dimensions of conflict– inter-personal conflict and task conflict and three approaches for managing conflict—confrontation, accommodation, and collaboration. Inter-personal conflicts are disagreements within networks based on non-task related incompatibilities. For example, some parties might develop negative feeling toward some large retailers in the network because the retailers have reputations of taking advantage of suppliers or they might have negative feeling towards an individual representing a firm in the network because the individual is perceived of as unethical. Inter-personal conflicts typically produce suspicion, distrust, and hostility among network members (Bradford et al, 2004). It reduces the network's ability to reach high-quality decisions and impedes the acceptance of decisions among network members. Inter-personal conflict limits processing of new information, gives rise to hostile attributions concerning each other's intentions and behaviors reduces receptiveness to ideas advocated by other network members who are disliked, and exacerbates effective communication and cooperation within the network (Amason and Schweiger, 1994). Task conflict is defined as disagreements over how to accomplish work together. It often arises from systemic or structural incompatibilities. Network members often have different organizational and societal cultures, resources, and capabilities that create differences in perspectives on how to accomplish work which leads to task conflict (Bradford, et al, 2004). Both types of conflict negatively affect network performance and can be addressed by appropriate conflict management strategies. Bradford et al (2004) found that the use of collaboration conflict management is effective in reducing both types of conflict. Accommodation conflict management is effective only at reducing inter-personal conflict and confrontation is effective only at reducing task conflict.

The two sources of conflict in the context of an internet channel addition are website adoption and E-commerce adoption. Depending on the level of intermediary involvement, content of website and future e-commerce intentions (as perceived by the intermediary), the conflict due to website adoption could increase or decrease. Conflict due to E-commerce adoption occurs depending upon the level of intermediary involvement, product range and future level of disintermediation (as perceived by the intermediary).Since it has become natural for almost every firm to have adopted an online presence, only conflict arising due to online activity has been considered for the rest of this paper. March and Simon (1958) have identified four different conflict resolution strategies. They are ***(1) Problem Solving, (2) Persuasion, (3) Bargaining, and (4) Politics.***

They are briefly explained below:

- Problem Solving occurs when channel members share common goals (which are apparent to both parties) and want a solution that satisfies the decision criteria of both parties. Information exchange, concessionary behavior, and identification of new alternatives are likely.
- Persuasion occurs when one party attempts to alter the other party's decision criteria so as to move the other party to a common set of goals. In this case, the common goals are not readily apparent to the two parties. Differences between the sub-goals of the two

organizations is reduced by emphasizing on the superordinate goals of the marketing channel.

- Bargaining occurs when common goals are not expected and the two parties have a zero-sum orientation. One party is expected to win at the expense of the other party.
- Politics occurs when there is fixed disagreement over goals and a zero-sum orientation. Unlike bargaining, there is a third party intervention as the two parties are unable to resolve the conflict themselves.

Relationships in Channels

Business markets are characterized by long term relationships particularly in the supply chain (Cannon and Perreault, 1999). Trust and Commitment are often used as measures of relationship strength. Trust exists when one party has confidence in an exchange partner's reliability and integrity (Morgan and Hunt, 1994). Commitment may be defined as an exchange partner believing that an ongoing relationship with another is so important as to warrant maximum efforts at maintaining it (Morgan and Hunt, 1994). The presence or absence of trust and commitment could influence the type of conflict resolution strategies used.

Koza and Dant (2007) looked at the effects of relationship climate, control mechanism, and communications on conflict resolution behavior and performance outcomes. If the relationship climate was cooperative orientation then it affected the bi-lateral communication while if the relationship climate was conflictive, then it affected the unilateral communication. Blut, Backhaus, Heussler, Woisetschläger, Evanschitzky, and Ahlert (2011) develop and test a lifecycle theory of franchise relationships.

The stages of a relationship developed in a franchise context are slightly modified and presented here in the context of channels.

i) Honeymoon stage: In this stage, the channel members are euphoric and enthusiastic about entering a new phase in their working lives and since they are inexperienced in running the business and have not yet developed an understanding of their roles and tasks in the system, they depend heavily on the manufacturer's guidance, and welcome their advice. There is a positive evaluation of relationship, dependency and cooperation by the channel member.

ii) Routine: Honeymoon stage is followed by a stage of disillusionment, frustration. Despite their initial training and guidance from the manufacturer, channel members regularly encounter problems after the honeymoon period ends, and some franchisees become so overwhelmed by the challenges that they are barely able to cope with organizing the day-to-day business activities. Moreover, franchisees must accept that their high levels of expectation toward profits is not realistic. Overall evaluation of the manufacturer will reduce and the level of conflict and self-interest will increase.

iii) Crossroad: This is an adjustment phase when channel members develop an understanding of how to cope successfully with the surroundings. They develop their own skills and expertise to deal with situations and the need for autonomy and independence will increase. Their power in the

relationship will also increase because of the acquired expertise. However, because of the contracts signed with the manufacturer, they will face a high level of dissonance at this stage and there might be a general negative evaluation of the relationship at this stage.

iv) Stabilization: Efforts by the manufacturer and channel member result in a positive evaluation of the relationship at this stage. Channel members are more realistic of their assessments and expectations and might develop more cooperative strategies if the relationship is mature. This stage is characterized by strong relationship norms. Blut et all(2011) found that cooperation variables were high in honeymoon and stabilization phases and low in routine and cross road phases and relationship variables such as satisfaction, trust, commitment and loyalty were high in the honeymoon and stabilization phases, and low in the routine and crossroad phases.

Research Propositions

In this paper, I adopt the typology developed by Bradford et all (2004) for classifying conflict as task related conflict and interpersonal conflict. Blut et all (2011)'s framework for classifying the stages of lifecycle and March and Simon(1958)'s conflict resolution strategies will be used for developing the propositions. When a manufacturer adds an internet channel, there could be two kinds of conflict that could arise. One could be the interpersonal conflict which arises because of miscommunication among channel members, perception of opportunistic behavior by some members in the manufacturer team, lack of coordination, etc. There could also be task related conflict that arises because of the differences in culture between the channel member firm and the manufacturer. Channel members might want to retain the indirect channels and focus on improving the distribution in indirect channels while the manufacturer firm might want to expand the reach through e-commerce. There could be difference in pricing strategies which could also be a source of task related conflict.

In the honeymoon stage of the relationship between the manufacturer and channel member, the trust, commitment and dependency of channel member towards the manufacturer will be high. When the conflict is interpersonal, then there is a distrust generated by the behavior of some individuals in the manufacturer's firm. The channel member would misunderstand the intention of some of the members of the manufacturer when the internet channel is added. There is also a communication gap. This will reduce the trust and commitment that is salient in this stage. But however since, the dependency in this stage is high, channel members will not adopt any zero sum resolution strategies. Problem solving where channel members discuss the issue with the manufacturer is a probable conflict resolution strategy. Another strategy that could be used is persuasion. Since the manufacturer has more power, they could convince and make the channel member to see eye to eye in this stage. Thus persuasion is another probable strategy.

P1: When the conflict is interpersonal in the honeymoon stage, the conflict resolution strategies adopted are problem solving and persuasion. Even when the conflict is task related, due to the high dependency, the channel members would try to resolve the issue amicably to both parties.

P2: When the conflict is task related in the honeymoon stage, the conflict resolution strategies adopted are problem solving and persuasion. The next stage of the relationship is the routine stage.

The channel members would be facing disillusionment in this stage and the level of self-interest and conflict would be high. In this stage the addition of internet channels by the manufacturer could create further disillusionment among the channel member and their level of distrust would on channel members would be high. There might be a high level of miscommunication and animosity among channel members at this stage. Channel members might resort to bargaining to get what they want. They might threaten to quit if their needs are not addressed. Thus

P3: When the conflict is interpersonal in the routine stage, the conflict resolution strategies adopted is bargaining. When internet channels are added at the routine stage, and there is task related conflict, channel members might perceive it as another obstacle in their business but might not attribute the problem to individuals but might see it more as a class of goals between the two organizations. Thus they would resort to problem solving to settle the problem. Strategies such as having an equal pricing across channels; or online channels not catering to regions where the channel member is present could be developed. Thus

P4: When the conflict is task related in the routine stage, the conflict resolution strategy adopted is problem solving. In the cross road stage, there is a high level of dissonance that exists with the channel members. They feel locked in because of the specific investments. The level of relationship norms would be low. At this stage, when the addition of internet channels creates interpersonal conflict, the relationship would get further worsened. Due to a high level of miscommunication, either party would not be willing to talk to each other to resolve the issue. Hence a third party intervention might be required. Thus

P5: When the conflict is task related in the crossroad stage, the conflict resolution strategy adopted is politics. When the conflict is task related, the parties would not resort to problem solving as the level of trust would be low. Since by now they are used to the system, they would have developed a significant amount of power and the dependency would have reduced. Persuasion might not also work. Since the conflict is at the task level only, both channels might decide to settle it with each other as a zero-sum game. Thus

P6: When the conflict is task related in the crossroad stage, the conflict resolution strategy adopted is bargaining. In the stabilization stage, the relationship reaches a maturity. If a channel member has come up to this stage, then the relationship norms would have improved and there would be a relatively higher level of satisfaction, trust and commitment in this stage.

At this stage, if the manufacturer introduces internet channels resulting in interpersonal conflict, then it is likely that either party might try to oversee the behavior in light of the long relationship they have maintained and the trust that developed. It could result in either the channel member getting persuaded to not take the issue seriously or to confront the manufacturer and persuade them to act in the channel member's interest. Thus persuasion would be a possible strategy at this stage.

P7: When the conflict is interpersonal in the stabilization stage, the conflict resolution strategy adopted is persuasion. When the conflict is task related at stabilization, the manufacturer and channel member would work together to resolve the issue. Thus

P8: When the conflict is interpersonal in the stabilization stage, the conflict resolution strategy adopted is problem solving.

The propositions are summarized in table 1.

Lifecycle stage	**Interpersonal Conflict**	**Task Related Conflict**
Honeymoon	P1- Problem solving and Persuasion	P2-Problem solving and Persuasion
Routine	P3- Bargaining	P4-Routine-Problem solving
Cross road	P5-Politics	P6-Crossroad-bargaining
Stabilization	P7- Persuasion	P8-Stabilization-problem solving

Table 1: Conflict resolution strategies

Conclusion-

With the growth of technologies and channels, managers will find it critical to manage conflicts effectively. Given that most channels evolve over time, the relationship stages between channel partners would differ and can influence the conflict resolution strategies. This paper addresses the research gap in this area by exploring the role of relationship stages and its effect on channel resolution strategies and puts forward conceptual propositions. Future work can empirically test the model through qualitative or scenario-based between-sample experimental research designs.

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Influence of customer behaviors on their behaviors on their Susceptibility towards influencers in HEI

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Abstract:

The growing power of influencers in social media and internet has emerged as a new level of filtering brand communications to the customer. While it is established that the consumers are susceptible to online influencer, our study intends to find out the behavior of the consumer that adds weight to their susceptibility. This study elaborates on the Meta-Maven behavior, information seeking behavior & opinion seeking behavior of the consumer and their direct influence on customer susceptibility. The study further elaborates on the dimensions of the influencer that contribute to the susceptibility of the consumer such as knowledge, trust and expertise. We have focused our study on the higher education industry as we believe this behavior may not extend to other industries which only further studies can confirm. Through this study we try to establish that there is a quadratic relationship between information seeking behaviour of the customer and their susceptibility to online influencers.

INTRODUCTION

1.1 Background to the study

The Internet has grown tremendously in the last two decades in terms of applications, connectivity and influence. More than 50% of the world's population has access to internet and internet penetration is more than 80% in developed countries like the United Kingdom and the United States of America. The growth of internet usage has been more than 1000% in the last two decades. Such accessibility and growth led to the rise of the online civilization. People begun having a life in the second world, the virtual world. The social networking, vitality and reach created new relationships and added complexity to the society. It accentuated new behavior and changed the way how businesses were conducted. While the idea of businesses are evolving from the physical markets to internet marketplaces, so has the behavior of the consumer. The traditional assumptions of marketing, business as a whole has to be questioned and retested to ascertain their value today.

New set of channels for consumer and business interactions have emerged over time. Social Networking, Viral Marketing and influencers based strategy is increasingly being recognized as the most effective way of influencing customers to buy their products. Unlike the traditional mass-marketing and direct marketing, these trends leverages their networking, connection and social behavior to spread the communications easily and effectively.

Blogs, videos and photos have garnered a great deal of attention as the emerging phenomenon in the online world. The current generation of internet users barring the digital natives are constantly online and are highly influenced by various content that are available for consumption. This has moved up to the level when we had the co-founder of the mighty social network Facebook call out for its break down as it has become too powerful. Willingly or unwillingly the internet users contribute to the information/opinions that are available online and these opinions in turn influence and shape the opinions of others. There are certain individuals like celebrities in the offline physical world, influence their followers and otherwise in shaping their opinion about a product or a concept.

Digital Marketing is projected to be greatest channel for years to come for direct advertising and marketing communications. Consumers also play an active role in searching for information online with an intent which influence behaviors and responses to various stimuli. The online world or the virtual world has provided the users with powers to choose their surroundings and settings and their behavior need not necessarily reflect their offline behavior. Thus consumer behavior and its assumptions need not necessarily hold good for online consumer behavior.
Marketing Channels have evolved, Multi-channel marketing and Omni-channel marketing have become a very common occurrence for all kinds of products and services. Given such changes and evolution of the internet and changing consumer behavior it becomes important to study the phenomenon and its applications in the future. It is on this basis, this study investigated the influence of Marketing Maven behavior in online world on the customer susceptibility towards online forums, information aggregators and influencers.

1.1.1 **Concept of Meta Maven**

The concept of Market Maven was originally introduced by Feick and Price (1987) and was widely accepted as a highly valued concept of scholarly interests. The Market Mavens are group of customers who take interest in gathering, accumulating and thereby sharing marketplace information. These set of customers are trusted to be a credible source of information and sometimes even trump the information disseminated through direct marketing. This phenomenon has been thoroughly studied in the offline physical models of marketing and web based marketing as well.In 2012, Stuart J. Barnes and Andrew D. Pressey coined the term Meta-Maven. They studied the market maven behavior across three different channels, Virtual, web and real-life to examine the extent to which market maven behavior transcends across these channels. They established that market maven behavior transcends across channels and its propensity is influenced by the channel context. Thus a Meta-Maven is a consumer who has market place information and is willing to share the information across channels for the benefit of others. This study attempts to establish the effect of this Meta-Maven concept and its effects on consumer behavior and therefore the effect on their susceptibility towards online influencers and aggregators who are contributing heavily to the growing internet marketing phenomenon. The relationship between Meta-Maven

behavior and their susceptibility will provide greater insights in understanding your virtual consumer and transcend the channels in selling and communicating with the customer in different channel contexts.

1.1.2 Concept of Customer Susceptibility

Consumers recently have resorted to using social information while making decisions, especially in uncertain conditions. Susceptibility to interpersonal influence and reference groups in such situations is well established by Bearden, Netemeyer, and Teel 1989 and Park and Lessig 1977. Customer Susceptibility is defined as the tendency to learn about products by seeking information from others. Customer Susceptibility has been established as an effective influencer in decision making process of an individual.

A study was conducted by Cheol Park, Yao Wang, Ying Yao, and You Rie Kang in 2011 on the factors influencing e-word of mouth effects. The influence of e-WOM effects on customer susceptibility was well established. However, the limitation of the study was that it couldn't account for the information aggregator websites, and the study was restricted only to china which has a different dynamics in the virtual world compared to rest of the world.

1.2 Research Problem

Advertisers are finding influencers and other direct marketing channels to influence buying behavior of the consumers. However, there is a considerable amount of money and effort spent on identifying the right target group to initiate communication. There are multiple ways of reaching out to the target consumer online such as Video Ads, text ads, display banners, influencer marketing, inbound marketing and Search engine marketing (Ducoffe, 1996; Goldsmith and Lafferty, 2002; Korgaonkar and Wolin, 2002; Wolin and Korgaonkar, 2003). There is a huge effort to identify behavior amongst consumers to segment and customize marketing communications.

A lot of research has been done on internet advertising and Market Mavenism. At this point in time, we cannot differentiate between Market Mavenism of an individual online and in offline situations. This has to be considered as a singular phenomenon called "Meta Maven", a combination of his/her online and offline behavior. While this phenomenon has been considered in different perspectives, the effects of Meta Mavenism on consumer behavior is an area yet to be explored. While the influence is considerably easy to relate to in e-retail and other online services, products such as education degree and diplomas are bought once or rarely in a lifetime. The consumer journey can very much be related to a standard B2B buying behavior which long and involves are lot of influencers in the decision making process. Gillian Moran & Laurent Muzellec (2014) advocates that there is no one framework to analyze the factors contributing to the credibility of influencers and therefore customers' susceptibility.

Ohanian 1990, establishes that endorsers & influencers are characterized by three dimensions, source's expertise, trustworthiness and attractiveness. However, attractiveness seems highly irrelevant to the online forums and information aggregators, the other dimensions are highly applicable. With reference to online forums, expertise and trustworthiness can be recognized as two different parameters and have differentiated influence in customer's susceptibility and needs

to be detail with respect to Higher Education Industry (HEI). Numerous assessments of convergent, discriminant, and nomological validity are offered by Ohanian (1990, Table 5, p. 48).

With this study, we intend to study the link between Opinion Seeking behavior, Meta Maven behavior, Information Seeking Behavior and their relationship between customer susceptibility towards online forums/information aggregators and Individual influencers.

LITERATURE REVIEW

2.1 Introduction

In general, consumers find it important to hear the opinions of others while (or before) making purchase decisions. They talk and discuss their purchase intentions with family members, relatives, and friends. In general, this exchange of product or service experience is termed as WORD OF MOUTH (WOM). WOM has a significant impact on product sales, According to Nielsen, in 2012, consumers around the world said they trust recommendations from friends and family (earned media) above all other forms of advertising. Word of mouth is widely considered as a powerful influence in the consumer marketplace, especially on consumers' information search and subsequent decision making. This has given way for a new marketing tool namely Word-of-mouth marketing

2.2 Electronic Word of Mouth (eWOM)

The Internet is changing the nature and power of Word-Of-Mouth communications and the directions and volume of communications among the firm and consumers. The Internet provides a much better way for consumers to gather product information and consumption-related advice from other consumers by electronic WOM (eWOM) like online review. eWOM or word-of-mouse is basically the extension of traditional WOM on the Internet. eWOM activities differ from those in the real world in many aspects. In marketing literature WOM communication is "oral, person-to-person communication between a receiver and a communicator whom the receiver perceives as noncommercial, regarding a brand, a product, a service or a provider". But, eWOM is about a kind of communication on the internet platform, but not by face to face or by oral. The arrival and expansion of the Internet has extended consumers' options for gathering product information by including other consumers' comments posted on the Internet, and has provided consumers opportunities to offer their own consumption-related advices by engaging in electronic word-of mouth (eWOM).

Comparing with WOM, Bickart and Schindler (2001) showed that eWOM may have higher credibility, understanding and relevance to customers than commercial sources of information on the internet created by marketers. Spoken word versus written word, face-to-face interaction versus indirect interaction, identification versus anonymity, and narrow reach versus broad reach are the dimensions which differentiate WOM with eWOM. As the number of internet users is growing and the number of people who post or share their opinions or experiences is also increasing,

internet-mediated communication has become more and more important eventually and as result companies are framing social marketing strategies. eWOM is recognized as an effective tool for building brand awareness, creating hype in the marketplace, influencing purchase decisions and developing brand loyalty. eWOM is a predominant factor while doing online/offline purchases. Through various researches it has been found that impact of eWOM on purchase decision is enormous.

2.3 **Market Mavens & Meta-Mavens**

Market Maven is a concept first introduced by Feick & Price (1987). They defined market maven as "Individuals who have information about many kinds of products, places to shop, and other facets of markets, and initiate discussions with consumers and respond to requests from consumers for market information". Barnes and Pressey, 2012; Belch et al., 2005 studied the transferability of this propensity in virtual worlds and web-based channels. Then this study was extended to study that propensity in the "cyber market space" (venkatesh, 1998), which they termed as "Cyber Maven". Novak et al., 2000 measured the involvement in computer-human mediated interactions and observed that the involvement is high and has a direct effect in customer susceptibility.

The digital marketspace has significantly grown over the last two decades in popularity and in economic value and was estimated to be worth US$6 billion by the end of 2013 (Worthen, 2010). As a consequence, these online platforms provide considerable opportunities for marketers and for the dissemination of product information (Barnes and Pressey, 2012; Saren et al., 2013; Cachia et al., 2007), virtual brand development (Barnes et al., 2015), and virtual entrepreneurs (Papagiannidis et al., 2008). Digital and social media have empowered consumers and that brands have an important role in facilitating conversations among consumers and themselves, openly sharing the values that will help consumers connect with them and with one another (Todd Powers et al., 2012). Online consumer socialization through peer communication also affects purchasing decisions in two ways: directly (conformity with peers) and indirectly by reinforcing product involvement. In addition, consumers' need for uniqueness has a moderating effect on the influence of peer communication on product attitudes. These findings have significant theoretical and managerial implications (Xia Wang et al., 2012). However there is significant research gap in identifying the role played by the Meta-Maven propensity towards customer susceptibility to online influencers.

2.4 Customer Susceptibility

Williams, E. J., Beardmore, A., & Joinson, A. N. (2017) argued theoretically that some individuals are more susceptible to online influence. Their study focused on phasing emails and the construct of social engineering (Anderson, 2008). Vishwanath et al., 2011 argue that along with demographics, the content also plays a crucial role in susceptibility of the consumer along with various other factors.

While all the research have focused on the propensity of Meta-Maven behavior on different constructs of consumer behavior, there is a lack of research on the impact of Meta-Maven behavior

or other consumer behavior constructs as a factor in consumer susceptibility, not only to phising messages and con-jobs but also towards marketing messages and buying decisions. European Online Grooming Project et al., 2012; Suler, 2004 also established that susceptibility of consumers can be different in online world compared to offline world. In fact, they say that young people who do not appear to be vulnerable offline can become vulnerable in online settings due to increased levels of disclosure and lowered inhibition in online settings.

Williams, E. J., Beardmore, A., & Joinson, A. N. (2017) goes further to state that consumer behavior, persuasion and decision making suggest a number of trait and state-induced individual difference factors may impact susceptibility and needs to be studied further.

2.5 Consumer Behavior and Customer Susceptibility

The evolution of Digital marketing has created many influencer channels for the businesses to utilize and promote business. E Uzunoğlu, SM Kip, 2014 talks about brand communication through digital influencers. However, they restrict themselves to studying the bloggers as influencers. Katz and Lazarsfeld (1955) stated that the direct brand communications effected by mass communications are filtered by opinion leaders and claims that inter-personal communication is more powerful compared to mass media. While it is true, what is the customer behavior construct that drives their susceptibility towards such influencers is the larger question that need to be asked in this context. Opinion leaders, act as intermediaries in online communications (McQuail and Windahl (1993, p. 63)). These opinion leaders online can be working through any channel, not necessarily through blogs. Online discussion forums, Information aggregators such as Wikipedia, quora etc also play a role in filtering the digital noise. Thus there is an imminent need to study what makes the customer susceptible to these influencers and a differentiated study to what kind of channels makes the customer more susceptible. Our study intends to find the consumer behaviors that makes them susceptible to such influencers and why.

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on the research methodology used in this study. It gives a brief description about the research approach used in this study, the research design, the target population, the instruments used to carry out the research, collection of the data and the analysis methods used.

3.2. Research Design

This study uses the descriptive research. Descriptive research involves gathering data that describe events and then organizes, tabulates, depicts, and describes the data collection (Glass & Hopkins, 1984). It often uses visual aids such as graphs, charts and tables to aid the reader in understanding the distribution of data, thus offering a better understanding on the hypothesis. The collected data was analyzed using SPSS (Field, Andy. 2013) & Smartpls software's (Bido, D., da Silva, D., & Ringle, C. (2014))

3.3 Population of the Study

The study was done through a questionnaire pan India. The population consisted of people who were either under graduates or postgraduates. The study targeted youth who aspire to do higher education and people who have completed their post-graduation studies. Since the study dealt with the influence of Meta Mavenism on the susceptibility of the consumer, we ensured that the responses gathered from the target people are aware of the numerous platforms available on the Internet when it comes to providing information or seeking information towards Higher Education. The population majorly consists of prospects who had taken CAT entrance exam for MBA admissions and the chances of them accessing internet for information are very high. It was ensured that the population are from diverse background and different parts of the country.

3.4 Data collection

The research made use of primary data which was collected using structured questionnaire. The administered questionnaires were collected after completion by the respondents which were later used for the analysis. Respondents completed on online survey that included the Internet maven scale (Appendix 1), questions regarding their Internet usage, and demographics. There was no demographic constraint as this survey was conducted pan India.

3.5 Data Analysis Method

The study applied both nominal and ordinal scale to measure a range of factors establishing the effectiveness of internet advertising on consumer behavior and an interval scale in determining the relationship between customer susceptibility and consumer behavior. Descriptive statistics was used to analyze this data. The mean responses, standard deviation and other relevant statistics were computed to better understand the data. The data collected was compiled and edited to check for logical inconsistencies. The data was then coded according to the responses. Relationships between responses was assessed and presented using tables and graphs and analysis was done using SPSS & Smartpls. Regression and Correlation analysis was applied in this study to reveal relationships among variables in the findings from the data.

DATA ANALYSIS, RESULTS & DISCUSSIONS

4.1 Introduction

This Chapter presents with the analysis and the study as set out in the research design. The results were present on the effect of Consumer Behavior on Customer Susceptibility. The data was collected using a structured questionnaire administered online to select respondents. All of the respondents

4.2 Background Information

The study was conducted with 50 respondents all over the country. The study findings are as follows

Table 1: Distribution of the Respondents by Age

	N	Minimum	Maximum	Mean	Std. Deviation
Age	50	22	52	29.98	8.434

Majority of the students were less than 30 years of age

Table 2: Distribution of Respondents by Education

Educational Qualification	Frequency	Percentages
Post-Graduates	28	56%
Undergraduates	20	40%
Diploma/Others	2	4%

As shown in table 2, study sample is a representative of all types of educational qualifications with post-graduates being the highest.

Table 3: Distribution of Respondents by Internet Usage

Internet usage/day	Frequency	percentage
Less than 1 hour	2	4%
1-2 hours	8	16%
2-3 hours	15	30%
3-4 hours	8	16%
More than 4 hours	17	34%

All of the respondents responded that they use Internet every day and as shown in table 3, majority of them use internet for more than 3 hours in a day. Table 4 contains the descriptive statistics which includes Mean, Standard deviation & correlation.

Table 4 : Descriptive Statistics

Correlations							Mean	Standard Deviation
	2	3	4	5	6	7		
1. Information Seeking Behavior	0.256	.510**	.316*	0.165	0.076	.424**	3.4091	0.89461
2. Susceptibility to Online forums		0.262	.492**	.706**	.673**	.339*	5.6932	1.30725
3. Susceptibility to individuals			.350*	0.173	0.084	0.291	2.9545	0.89093
4. Meta Mavenism				.361*	.435**	-0.086	3.2273	0.68958
5. Trustworthiness					.775**	0.110	5.8864	1.45596
6. Expertise						-0.063	6.5682	1.86020
7. Opinion seeking behavior							3.7159	0.96688

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

4.3 Conceptual Framework & Hypothesis

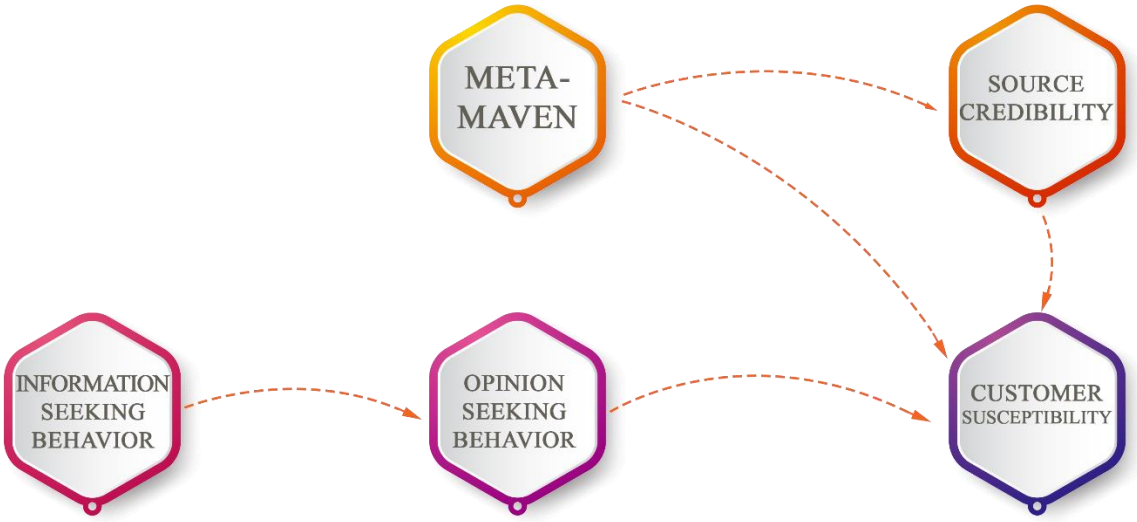

Figure 1: Hypothesized Model 01

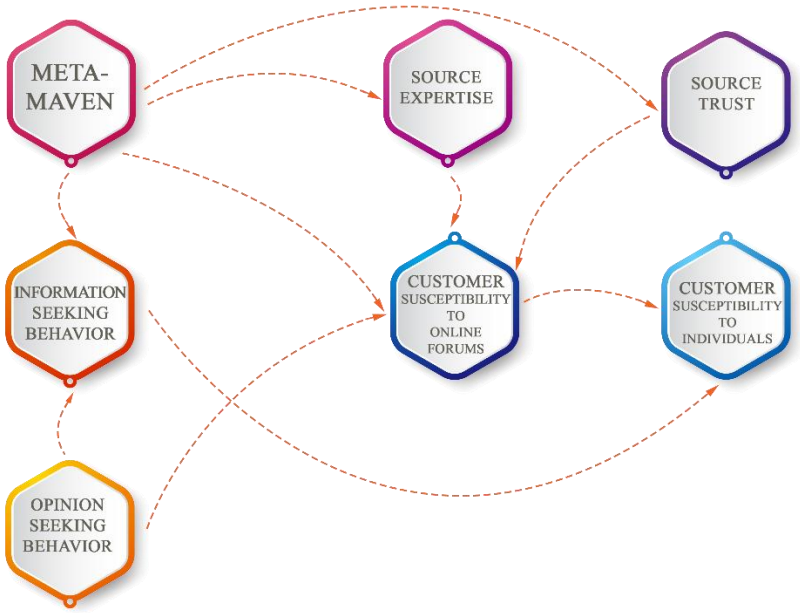

Figure 2: Hypothesized Model 02

Figure 1 & 2 represents the hypothetical model of the study conducted by us and the respective relationships that were analyzed. Model 01 analyses the relationship between consumer behavior and customer susceptibility while Model 02 further splits the constructs to its respective dimensions and analyses the change in relationship. The credibility construct is further broken down into Expertise & Trustworthiness and Susceptibility is broken down to Susceptibility towards Online forums & information aggregators and customer susceptibility towards standalone individual influencers. The results of the structural model suggests a good model fit.

4.3.1 Meta-Mavens, Opinion Seeking Behavior and Customer Susceptibility

The Meta Mavens can be defined as a group of customers who take interest in gathering, accumulating and thereby sharing marketplace information across channels, both online & offline. Research has established that Market Maven behavior influences buying decisions of customers across different verticals for different products. Customer Susceptibility is defined as need to identify with or enhance one's image in the opinion of significant others through the acquisition and use of products and brands, the willingness to conform to the expectations of others regarding purchase decisions, and/or the tendency to learn about products and services by observing others or seeking information from others (Bearden et al. 1989, p. 474). With the evolution of the concept of Market-Maven to a Meta-Maven, we expect the Meta-Maven behavior to positively influence the susceptibility of the customer to online forums (H1).

- ✓ *H1: Meta –Maven behavior has a positive influence on customer susceptibility to information aggregators/Online forums*

Similarly opinion seeking behavior happens when customers search for advice from others to make a decision. They rely on Opinion leaders to assist them in making the decision. We hypothesize that Opinion Seeking behavior has a significant positive relationship with customer susceptibility to online forums (H2).

- ✓ *H2: Opinion seeking behavior has a significant positive influence on customer susceptibility to information aggregators/Online forums*

4.3.2 Credibility and Customer Susceptibility

Ohanian 1990, suggested that celebrity endorser's credibility is posited to be characterized by three dimensions; Expertise, trustworthiness & attractiveness. We set out to study if the same holds good for online influencers as well. However with a minor difference, attractiveness of the influencer model did not hold well, as most online forums & influencers with respect to HEI did not consider attractiveness as an important characteristic. Therefore we used the two dimensional model of expertise and trustworthiness of the influencers. We expected that the credibility of the influencers positively influence the customer's susceptibility to the online forums & influencers in the virtual world (H3).

- ✓ *H3: Credibility of influencers has a significant positive influence on customer susceptibility towards information aggregators/Online forums*

4.3.3 Meta mavens, Information Seeking & Individual Influencers

Reynolds and Darden (1971) measured an information seeking factor in opinion leadership because it is thought to be a critical determinant of word-of-mouth communication and interpersonal influences affecting the diffusion of new products, concepts, and services. We wanted to test the relationship between the Meta-Maven behaviors of having a need to disseminate information with Information seeking behavior. We expected that the Meta Maven behavior has a reciprocate relationship with information seeking. As there is a tendency to share information, there is also an urge to gather information (H4).

- ✓ *H4: Meta-Maven behavior has a significant positive influence on Information Seeking tendency*

While this connection is established, we also expected that the Meta-Maven behavior has a significant positive influence on customer susceptibility to individuals online who are influencers (H5). This is different from the earlier theory on customer susceptibility to online forums and information aggregators where the information is collective and not one man's opinion. The individual personality does not come into the picture in the earlier structure.

- ✓ *H5: Meta-Maven behavior has significant positive influence on customer susceptibility to Individual influencers*

4.3.4 Meta mavens, Types of Influence & Credibility

On qualitative interviews with the respondents we identified that the customers are exposed to two different types of influencers online that they depend upon. Information Aggregators & online forums which are a collection of multiple individuals sharing information and opinion on topics and there are individuals who share opinions & information exclusively. Thus we expected significant positive influence in both cases, however we wanted to measure the same and identify which type has a stronger relationship with the Meta-Maven behavior of the customer. Therefore

we expected the relationship between Meta-Maven and Susceptibility to online aggregators will be stronger than relationship between Meta-maven and susceptibility to individual influencers (H6).

- ✓ *H6: The relationship between Meta-Maven behavior and customer susceptibility to online forums & Information aggregators will be stronger than relationship between Meta-maven and susceptibility to individual influencers*

Further to the two dimensional theory of Reynolds & Darden (1971) we expected that the relationship between Meta-Maven and Expertise of Information aggregators is stronger than the relationship between Meta-Maven and trustworthiness of Information aggregators (H7).

- ✓ *H7: The relationship between Meta-Maven behavior and Expert credibility of Influencers is stronger than the relationship between Meta-Maven and trustworthiness of Influencers*

4.4 Analysis and results

To mitigate the problems posed by common method variance among the reported variables by PSRs, the study deployed pre-hoc strategies. The Means, standard deviations & correlations were presented in Table 4. Post-hoc studies provided insights into the moderator effect of Meta-Maven behavior on Customer susceptibility to Online Influencers and Quadratic Effect of Information seeking behavior on Customer Susceptibility to Individual Influencers.

4.4.1 Measurement & Structural Model

Table 5: Measurement Model & Standardized loadings of the construct and items

Construct	Code	Items	Standardized loadings	CR	AVE
Consumer Susceptibility to Reference Group Influence(Online forums/ Information aggregators)	CSII02	The college which you select is influenced by observing a seal of approval of users in online forums or information aggregators (example: ranking agencies)	0.469	0.833	0.567
	CSMI01	How much weight do you give for opinions of information aggregators/online forums?	0.871		
	CSMI02	How much impact did you have on the thinking of the other internet users?	0.824		
	CSMI03	How much weight do you give for opinions of your friends or acquaintances who have relevant knowledge?	0.781		

Consumer Susceptibility to Interpersonal Influence	CSINT02	It is important that others value the degree & college I join.	0.822	0.874	0.698
	CSINT03	To make sure I join the right college, I often observe where others have joined.	0.875		
	CSINT04	It is important to me that my friends approve of the college.	0.808		
Information Seeking Behaviour	ISB01	I often seek out the advice of my friends regarding which college I choose.	0.912	0.893	0.737
	ISB02	I spend a lot of time talking with my friends about higher education & colleges.	0.760		
	ISB03	My friends or neighbors usually give me good advice on colleges I can study in.	0.895		
Meta-Maven behavior	MM01	I like introducing new brands and products to my friends.	0.653	0.840	0.513
	MM03	People ask me for information about colleges & courses to join.	0.757		
	MM06	Think about a person who has information about a variety of products and likes to share this information with others. This person knows about new products, sales, stores, and so on, but does not necessarily feel he or she is an expert on one particular product. How well would you say this description fits you?	0.785		
	MM07	I share my opinion in Online Forums on higher education	0.669		
	MM08	I prefer to share information online more than a phone call or offline methods	0.710		
Opinion Seeking Behavior	OSB01	When I consider doing a certification or a higher education degree, I ask other people for advice.	0.920	0.935	0.877
	OSB03	I like to get others' opinions before I choose a course or college.	0.953		
Trustworthiness	RTAG01	Trustworthiness	0.838	0.918	0.693

	RTAG02	Dependability	0.790		
	RTAG03	Honesty	0.797		
	RTAG04	Reliability	0.835		
	RTAG05	Sincerety	0.898		
Expertise	RTAG06	Expertise	0.979	0.981	0.963
	RTAG07	Knowledge	0.984		

The study was assessed through PLS, bootstrapping and blindfolding algorithms using smartpls3.0 software. The values of composite reliability (CR) were in the range of 0.84- 0.98, which is higher than the cut-off value of 0.7 and thus all the constructs possess reliability. The average variance extracted (AVE) values are in the range of 0.51-0.96 for our study constructs, which is greater than 0.5 as recommended by (Fornell and Larcker, 1981). Hence, all constructs possess convergent validity. The discriminant validity of the constructs were also established using the Fornell and Larcker, 1981 guidelines.

The results of the structural model suggest that all the hypotheses are significant, but for one. The relationship between Meta maven behavior and Customer Susceptibility was positive and marginally significant (β = 0.259, p <0.1). The relationship between Opinion Seeking behavior and Customer Susceptibility to online forums & information aggregators was positive as well (β = 0.357, p <0.1). The influence of credibility of influencers on customer susceptibility towards online forums & information aggregators was also found positive and significant (β = 0.682, p <0.1). The relationship between Meta-Maven behavior and Information seeking behavior is positive and significant (β = 0.330, p <0.1). The relationship between Meta-Maven behavior and customer susceptibility towards individual influencers was not significant (β = 0.143, p <0.1). This is shown in Table 6.

Table 6: Structural Model Results

Path	**β**	**t-Statistics**	**Supported/Not Supported**
H1: (Meta-maven behavior on Susceptibility to Online Forums)	0.259*	1.781	Supported
Hypothesis 02 (Opinion Seeking on Susceptibility to Online Forums)	0.357*	3.048	Supported
Hypothesis 03 (Credibility of Influencers on susceptibility to Online forums)	0.682*	6.204	Supported
Hypothesis 04 (Meta-Maven behavior on Information Seeking behavior)	0.330*	2.44	Supported
Hypothesis 05 (Meta-Maven on Customer Susceptibiltity to individual influencers)	0.143*	0.853	Not Supported

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

The relationship between Meta-Maven behavior and customer susceptibility to online forums & information aggregators was stronger than the relationship between Meta-maven behavior and

customer susceptibility to individual influencers as t-statistics established that the latter is insignificant while former is marginally significant. Similarly, relationship between Meta-Maven and Expertise of Influencers was stronger than the relationship between Meta-Maven to trustworthiness of the influencers based on the β and t-statistics for the individual constructs. This is shown in Table 6.

Table 7: Structural Model Results - 02

Path	β	t-Statistics	Supported/Not Supported
Hypothesis 06			
Meta-Maven to Online Aggregators	0.261*	1.749	
Meta-Maven to Individual Influencers	0.143*	0.853	Supported
Hypothesis 07			
Meta-Maven to Expertise of Influencers	0.471*	3.900	
Meta-Maven to trustworthiness of Influencers	0.378*	2.693	Supported
Moderator Effect of Meta-Maven behavior on Customer susceptibility to Online Influencers	-0.0212***	2.528	Supported
Quadratic Effect of Information seeking behavior on Customer Susceptibility to Individual Influencers	-0.0313***	2.595	Supported

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

4.4.2 Indirect Effect

While performing the structural analysis, we found that certain surprises in the data analysis results. The study found that there exist a moderation relationship between the Meta-Maven behavior on customer susceptibility towards online influencers and found that there is a significant moderating effect (β = -0.0212, p <0.1). The negative β value indicates that whenever there is an increased meta-maven activity, this leads to lesser susceptibility in the online influencing behaviors. Similarly, a significant quadratic effect is established between the Information seeking behavior of the customer to customer susceptibility to Individual Influencers (β = -0.0313, p <0.1). This indicate an inverted U-shaped relationship. This again has a negative β value suggesting there is an inverted U curve, i.e. Meta-Maven behavior and Information Seeking Behavior decreases the customer susceptibility to online influencers in their extreme behaviors and increases the customer susceptibility to online influencers in a moderate level. Therefore partial mediation exists. The data can be found in Table 6.

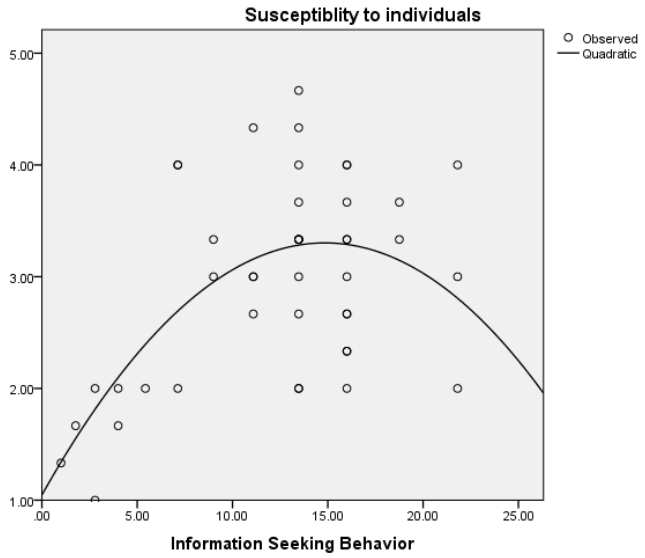

Figure 3: Inverted U-Curve of Quadratic Regression Analysis

On testing the model with a Blindfold Algorithm, the constructs has Q^2 values greater than 0 indicating that the model built has predictive ability.

Table 8: Blindfold Algorithm Test for Predictive Nature

Constructs	**Q^2 (=1-SSE/SSO)**
Expertise	0.201
Susceptibility1_Individual Influencers	0.331
Susceptibility2_online forums or information aggregators	0.178
Trust	0.084
*infoseek_*	0.183
Q2 > 0 indicates that the model built has predictive relevance	

4.5 Discussion

This study explored the consumer behavior constructs such as Information Seeking behavior, Opinion Seeking behavior, Meta-maven behavior and their relationship with customer's susceptibility towards online influencers as individuals and as a forum in the form of Information aggregators & opinion forums. Most of the respondents have shown that they are susceptible to online influencers especially because of their Meta-Maven behavior to disseminate information they have acquired through these channels. The Meta-Maven behavior drives the information seeking behavior, i.e. the need to acquire information in order to disseminate is strongly exhibited. Further, this information seeking behavior has a quadratic relationship with the customer susceptibility. When there is no intent to acquire information, the customer is not susceptible to information provided by the influencers, similarly when there is an extensive search for information, they again are not susceptible to the influencers. They do not give weight to

information provided online when they rarely share anything themselves and they exhibit similar behavior when they share more frequently. However, when they share moderately, they become susceptible to influencers. Interestingly, these moderate users rated the influencers high on trustworthiness and expertise which suggests that they are choosy about the forums and people they depend on. This phenomenon has to be studied further.
The Meta-Maven behavior also displayed a moderator effect, i.e. when there is a huge tendency to share information, they are not susceptible to other influencers. These people can be influencers themselves and hence do not depend on others for advice. Again, this has to be studied further.

MANAGERIAL IMPLICATIONS AND CONCLUSION

5.1 Managerial Implications

Technology is evolving and there is a new medium, marketplace that is created every day. The technology churn has quickened and new technology is being invented every day. Behavioral studies have garnered utmost attention as businesses want to invest in predictive analytics to predict behavior of the customer even before he intends to take an action. The concept of influence and collective knowledge dissemination, crowd sourced knowledge is the order of the day.
There are multiple ways and format in which marketing communications are delivered to the customers. With this study, a manager can identify and segment his customer through his online behavior and create susceptibility scores. With this kind of segmentation, managers can identify the best format that can influence his decision making process. For example, a prospect with high Market Maven propensity calculated based on the number of reviews he/she has shared on amazon may not be too susceptible to peer opinion and therefore can be targeted using discounts or any other means rather influencer endorsements which might work for someone who has expressed moderate propensity. Therefore, this phenomenon can be further studied in detail to identify, segment and effectively target customers in the HEI. From Brexit voting to US presidential elections behavioral analytics have proven to be an effective way to shape customer opinions. Thus studies pertaining to consumer behavior, especially with respect to online and Omni-channel behavior will be a very effective tool for managers to deliver appropriate content in a timely and accurate manner.

Content is delivered to consumers in different formats. Pictures, videos, text, blogs, interactive banners and bots are some formats of content delivery in digital marketing. Each of the format has their own advantages and specificity in terms of content delivery. An insight into your customer's preference and propensity towards these formats and specificity, the delivery format can be customized individually. Thus this study and further studies in this line can have great implications in managerial decision making.

It is also established through this study, that consumers with Meta-Maven behavior are more susceptible towards online forums that has peer to peer discussions and communication compared to individual influencers. This can be a leveraging factor for brand managers to effective take brand communication through digital influencers. Brands spend millions in acquiring brand ambassadors and social media influencers to endorse their products online, however that seems to be insignificant considering the customer susceptibility is very low in the case as established. Instead,

brands can focus on creating social networks for peer to peer discussions which the customers are willing to engage with.

It is more interesting that there is a negative moderator effect between Market Mavenism and customer susceptibility and the quadratic effect between information seeking behavior and customer susceptibility. As a customer possess higher knowledge, he/she becomes less susceptible to influencers, even towards peer to peer discussions. Do Meta-Mavens become influencer themselves in a discussion forum environment is an interesting question to be studied upon. In such case, identifying this behavior and leveraging meta-mavens in an early stage can be a good strategy for business managers.

5.2 CONCLUSION

In the beginning of the study, we set out to study the evolution of Meta-Maven from the concept of Market-Mavens and other such consumer behaviors, their effects on the customer susceptibility towards online influencers. The market, market place, products and services as a whole has evolved and changed in the advent of internet and e-commerce. Consumer behavior therefore has taken its own course and adapted itself to the new conditions, which cannot be taken for granted with the studies conducted in offline environments. All the theories can be put to test, in order to find interesting changes and therefore, new ways of conducting business. While the fundamentals have remained constant, it is established through this study that consumer behavior predominantly transcends across channels both in the physical and online world with structural changes in little nuances as established earlier through the quadratic effect.
The reasons however, has to be validated with different samples and industry. This gives us more scope to study in the future. Internet, Machine learning, Artificial Intelligence and IoT has armed the marketers with great tools to segment and target customers with precision and efficacy. This study will help managers, to target customers using behavioral aspects and efficiently take the communication across channels.

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APPENDIX

Questionnaire:

Construct	Scales				
Name					
Age	Years				
Experience	years				
City of Origin					
Gender					
Educational Qualification					
Information Seeking Behavior					
I often seek out the advice of my friends regarding which college I choose.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I spend a lot of time talking with my friends about higher education & colleges.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
My friends or neighbors usually give me good advice on colleges I can study in.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Opinion Seeking Behavior					
When I consider doing a certification or a higher education degree, I ask other people for advice.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I rarely ask other people what & where I have to study.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I like to get others' opinions before I choose a course or college.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Affinity to use Internet					
How often do you use internet?	Everyday	More than once a day	Once a day	Once a month	Less than once a month
On average, how many hours per day do you spend on the Internet?	Less than 1 hour	1-2 hours	2-3 hours	3-4 hours	More than 4 hours
Do you share your opinion on products & brands in online forums?	Always	Very frequently	Occasionally	Rarely	Never
Consumer Susceptibility to Reference Group Influence(Online forums/ Information aggregators)					

Informational Influence					
You seek information about various brands and products from online forums or information aggregators	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
The college which you select is influenced by observing a seal of approval of users in online forums or information aggregators (example: ranking agencies)	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Your observation of what your peers do influences your choice of a college (such as the colleges your seniors/ friends & relatives joined).	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Manifest Influence					
How much weight do you give for opinions of information aggregators/online forums?	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
How much impact did you have on the thinking of the other internet users?	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
How much weight do you give for opinions of your friends or acquaintances who have relevant knowledge?	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
How much weight do you give for opinions of your friends or acquaintances who doesn't have relevant knowledge?	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Interpersonal Influence: Consumer Susceptibility to Interpersonal Influence					
If I want to be like someone, I try to join the same college he/she did.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
It is important that others value the degree & college I join.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
To make sure I join the right college, I often observe where others have joined.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

It is important to me that my friends approve of the college.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
When considering colleges, I generally consider colleges that I think others will approve of.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Meta-Maven behavior					
I like introducing new brands and products to my friends.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I like helping people by providing them with information about colleges & courses to study.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
People ask me for information about colleges & courses to join.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
If someone asked where to study a particular course, I can point him to the right college	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
My friends think of me as a good source of information when it comes to new products or sales.	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Think about a person who has information about a variety of products and likes to share this information with others. This person knows about new products, sales, stores, and so on, but does not necessarily feel he or she is an expert on one particular product. How well would you say this description fits you?	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I share my opinion in Online Forums on higher education	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I prefer to share information online more than a phone call or offline methods	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree

Online sources provide better information than individuals offline	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Rate Information Aggregators/Online Forums on the following					
Trustworthiness	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Dependability	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Honesty	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Reliability	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Sincerity	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Expertise	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Experience	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Knowledge	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Qualified	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Skilled	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Rate acquaintances/offline experts on the following					
Trustworthiness	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Dependability	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Honesty	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Reliability	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Sincerity	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Expertise	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Experience	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Knowledge	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Qualified	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				
Skilled	On a scale of 1 to 10, With 1 being the least score & 10 being the best score				

A Study on Factors Leading to Road Accidents on East Coast Road

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Abstract

According to road safety reports from multiple agencies, road traffic accidents can shrink a developing country's GDP (Gross Domestic Product by 3%. Considering that India although has only 1% of the world's total vehicles, but contributes to about 10% of the global road traffic accidents is alarming. Specifically, the south Indian state of Tamil Nadu has been listed among the top five states with most road traffic accidents over the past five years. Consequently, in this study, we gathered and analyzed data regarding registered accidents over a 25 km stretch of State Highway 49, also known as East coast road (ECR). We have identified five black-spots on this highway stretch that is prone to accidents. Further, our analysis of the major contributing factors indicated over speeding to be a major cause with the most probable outcome being minor injuries.

Keywords**:** *Road accidents; Black spots; Collision type; Road conditions*

Introduction

The UN General Assembly passed a resolution to reduce the road traffic fatalities by 50% during the period 2011-2020 [1], and this resolution was accepted by most countries around the world including India [2]. However, road safety reports published by the World Health Organization [3] and International Transportation Forum [4] have estimated that the annual number of fatalities caused by road traffic accidents is about 1.2 – 1.4 million, while the annual number of injuries is about 50 million. The WHO report estimates that developing countries lose approximately 3% of their GDP due to the road accidents [3].

A closer look at the accident data across the world reveals that India, a developing country with only 1% of the world's vehicles, accounts for about 10% of the total road traffic accidents around the world [5, 6]. In fact, India's State highways, that constitutes only 3% of the total road network, witnesses about 25% of the total road accidents in the country [7]. The MoRT&H report [7] indicated that the south Indian state of Tamil Nadu has contributed close to 14% of India's accidents during the years 2017 and 2018, and Chennai, the capital city of Tamil Nadu, has reported the most accidents amongst other major cities in India. Consequently, the focus of this paper will be on a 25 km stretch of State Highway 49, also called as east coast road (ECR). This highway connects Chennai to Cuddalore and covers the highway between the toll gate at Akkarai and Manamai village near Mamallapuram. It has to be noted that most of this stretch is a two lane road, and is prone to accidents. In this study, we focus on using registered accident data from online databases, and analyze the accident patterns to identify black-spots. Additionally, we identify factors that affect accident propensity along this highway stretch.

The rest of the paper is structured as follows. Section 2 furnishes the review of literature on identifying black spots and factors that affect accident propensity along the highway. Section 3 presents the methodology employed in our study along with the results from our study, while Section 4 presents the conclusion of our study.

Literature Review

The literature on accident analysis focuses on identifying black-spots where accident propensity is high, and then studies various factors that have an effect on the accident propensity at different locations. This section presents a brief review of literature on accident analysis.

The black-spot represent a stretch (of say 100 meters) on the road network with high accident propensity [8, 9, 10, 11]. McGuigan [8] rank ordered the black-spots using a factor called potential for accident reduction that denotes the change in magnitude between the number of reported road traffic incidents and the number of predicted road traffic incidents. Elvik [9] presents a meta-analysis of 36 different studies on road accident blackspot treatment using the log odds method. The study evaluated the extent of the degree of control of four known compounding factors (change in traffic volume, general trend in the number of accidents, regression to the mean, and accident mitigation). A more comprehensive review of literature on black-spot analysis is presented in Elvik [12].

The earlier models for estimating the black-spots used of accidents counts and rates in a statistical quality control framework [10]. However, this method suffers a drawback due to the bias that may be introduced as a result of the regression-to-the-mean phenomenon. This potentially bias can lead to the choosing a site with a randomly high accident count. Persuad, Lyon and Nguyen [10] refined the empirical Bayes method to estimate the safety of a site, in comparison with its expected safety. Based on this, they rank ordered the sites.

Vistisen [11] proposed a multivariate accident analysis model for Denmark under the assumption that the annual accident counts at a particular location are dependent on prior annual estimates. Accordingly, they disaggregated the accident models into sub-periods of one year. The random variation in accident frequencies was described using a hierarchical Poisson-gamma distribution. The model assessed the deviation in the expected accident frequency at a location when compared to other locations with similar accident propensities. Thus, this model explicitly considers both the general trend in accident counts and the dispersion effects. The model offered better sensitivity than earlier models that were implemented in Denmark. Geurts et al. [13] performed accident analysis to identify and rank black-spots for Flanders in Belgium. At the time of the study, Flanders had approximately 1014 black-spots identified based on prior accident data. They performed a sensitivity analysis by assigning weight measures. The weight was defined as (*a_b_c*), where *a* represents the weight for each light accident, *b* represents the weight for each serious accident and *c* represents the weights for each deadly accident. This analysis investigated the impact of 3 different weight combinations, (1_1_1), (1_1_10) and (1_10_10). The study also used the expected number of accidents that were predicted using the hierarchical Bayesian model instead of actual counts.

Mohan et al. [14] and generated spatial and temporal profiles of road traffic incidents (RTI) on the road network in Vellore. The daily time series counts on RTIs were obtained using the first

information reports (FIR) maintained in police stations (between January 2005 and May 2007), and the temporal characteristics were examined with respect to the vehicle, road-type and time of the year. A Poisson regression model was employed to estimate the trend in RTI. The study reported that more than 50% of RTI occurred in national highways, and black-spots were identified at major town junctions. The average RTI was significantly higher over weekends, and the fatality rate was 13%.

Mohan and Langde [15] identified black-spots on the Nagpur-Amaravati Asian highway 46 using data from the police department. They further conducted an on-field survey at these black-spots to bring out the latent details pertaining to the accidents. Other research effort that focused on black-spot analysis include the work of Chen [16].

The studies that analyzed accident propensity broadly considered the two types of factors – road infrastructure and human factors. The road infrastructure factors include road side design [17], road conditions and lighting [18], and lane width [19], while human factors include training level [18], sleepy driver [20], age and driver carelessness [21].

Ossenbruggen, Pendharkar and Ivan [17] employed logistic regression models and concluded that factors like land use, road side design, traffic exposure and traffic control devices played an important role in prediction of accidents through statistical models. The study also assessed that the rural areas were less prone to accidents than the urban centers.

Laha, Pravida and Ghosh [18] used data from the national bureau of crime records to identify the factors affecting accident propensity. The data revealed that the distribution of accident times was bimodal, and several combinations of bimodal distributions were considered in the modeling approach. The significant factors identified in the study included *bad condition of roads, traffic density, untrained drivers, slack in enforcement of rules, poor road conditions and sufficient road lighting in all areas***.** Additionally, by employing circular flow analysis, the study identified *times* during the day when accident propensity increased.

Mussone, Ferrari and Oneta [22] built a traffic model for Milan in Italy by employing an artificial neural network model. The study concurred that non-signalized intersections resulted in most of the accidents during the study. Fridstrøm et al. [23] developed a generalized Poisson regression model to study accident data from Denmark, Finland, Norway and Sweden. The study considered the variations of accident counts into parts attributable to randomness, weather, daylight and speed limit. The study concluded that 80-90% of the variation was accounted by randomness and exposure (or traffic volume).

Noland and Quddus [24] performed a disaggregate spatial analysis using data from London to study the effect of congestion on traffic safety. A negative binomial count model was used to test whether factor affecting serious accidents differ during congested and uncongested time periods. The study concluded that congestion can mitigate crash severity in urban conditions, while the same may not necessarily hold on highways and motorways.

Jha et al. [25] considered factors such as wet road conditions, driver without license, lack of protective gear and alcohol consumption, and analyzed the data collected from accident reports.

The data was classified based on age group, gender and educational level. The study inferred that the common modes of accident were being knocked down, falling off vehicles, collision between vehicles, being run over, overturning and vehicles hitting stationary objects. With the same dataset, Jha et al. [26] analyzed the injury pattern among accident victims, and found that head, neck, chest, abdomen, pelvis, upper and lower limbs and back were the most common areas injured. The study also inferred that head injuries were common among bicycle riders, pedestrians and motorized two wheeler riders as they failed to wear protective gear like helmet.

Cantillo, Garces and Marquez [27] explored the relationship between the urban road accidents and factors of road infrastructure, traffic volumes, and traffic control. A total of 69 accident prone areas in the city of Cartagena in Columbia were identified using Bayesian models based on GIS. The paper concluded that more accidents occur in commercial areas due to high pedestrian density. Golob and Recker [28] applied linear and non-linear multi-variable statistical analysis to investigate the relationship between contributing various factors and the type of accidents in southern California. The study concluded that the type of collision is strongly correlated to the traffic speed and the temporal speed variation in the left an interior lanes. Additionally, collisions involving multiple vehicles was found to be more prevalent on wet roads, and rear-end collisions occur on dry roads during daylight.

Ahsan [29] reviewed the process of accident reporting and recording system and the present status of the database. Further, the study also discussed the potential sources of error in accident data collection. It was observed that the sources of accident data are biased as a result of under-reporting, especially in the case of minor accidents.

The literature review alludes to the fact that factors affecting road accidents depends on the local road and weather conditions as well as other driver-related factors. As a result, given the large number of road traffic incidents in ECR, we see that there is a need to analyze the factors that affect traffic accident propensity in the highway.

Methodology and Results

In this study, we restrict ourselves to a 25 km stretch between the toll booth in Akkarai and Manamai village near the coastal town of Mamallapuram. This stretch is mostly characterized by only two lanes. We collected data regarding 100 registered road accidents over a period between 20-08-2018 to 26-05-2019. The variable used in our model can be broadly included into human variables and environmental factors including road conditions. The individual factors and their corresponding codes are listed in Table 1.

Table 1: Levels of each factor

Factor	Code	Description
Age	-	-
Sex	2	1 (male) and 2 (female)
# of lanes	2	1 and 2
Presence of footpath	2	1 (yes) and 0 (no)
Presence of shoulder	2	1 (yes) and 0 (no)
Shoulder type	2	1 (paved) and 0 (unpaved)

Junction type	2	1 (cross junction) and 0 (not a junction)
Presence of central divider	2	1 (yes) and 0 (no)
Severity of injury	3	1 (vehicle damage), 2 (minor injury) and 3 (fatal injury)
# of drivers involved	2	1 and 2
# of vehicles involved	2	1 and 2
# of passengers involved	5	0, 1, 2, 3, and 4
# of pedestrians	2	0 and 1
Collision type	4	1 (head on), 2 (hit from rear), 3 (hit pedestrian), 4 (skidding)
Speed Limit	1	40
Accident cause	3	1 (inebriated driver), 2 (driver fault), 3 (over speed)
Light conditions	4	1 (day light), 2 (twilight), 3 (darkness with poor street light), 4 (darkness with no street lights)

The data was then analyzed using R software to identify various factors that affect road traffic propensity.

3.1 Effect of each factor on Accident Propensity

Some of the key findings of our study are presented as follows.

1. The analysis on the effect of driver age on accident propensity shows that most of the accidents (37 out of the 54 records with age information, 68%) are caused by young drivers between the age of 18 and 35 as shown in Figure 1.
2. The gender-based analysis indicated that a male was involved in 94% (80 out of 85 scenarios) of accidents.
3. 99 of the 100 accidents occurred in two lane roads.
4. 98 out of 100 accidents occurred at highway locations that has a shoulder. Of these, 75.5% (74 out of 98) of the accidents happened in the presence of unpaved shoulders.
5. Only 7% of the accidents occurred at junctions. This means that most of the accidents happen in straight road segments, where the cause could be inebriated drivers, over speeding or other driver faults. A careful evaluation shows that 98 out of 100 accidents considered in the study occurred due to over speeding, while one accident was attributed to inebriated driver.
6. 91 % of the accidents happen at locations with no central dividers. This could mean that some of the accidents occur when an over speeding driver is trying to overtake in a two-lane road.

7. Out of the 100 accidents, 38 were head-on collisions, 34 were hit from rear collisions, 14 were caused by skidding, and the remaining accidents involved pedestrians (see Figure 2). 73 accidents involved two vehicles (drivers). In one of the case where two vehicles were involved, a pedestrian was hit.
8. Out of the 100 accidents, 13 resulted in vehicle damage, 77 resulted in minor injuries, while the remaining 10 were fatal.
9. An analysis based on number of passengers (other than the driver) involved showed that 72 accidents occurred when there were no passengers, 18 occurred when there was one passenger, 9 in the case of two passenger, and 1 in the case of four passengers.
10. Based on the light condition, it was found that 76 accidents occurred during the day time, 12 during twilight and the remaining 12 in darkness. Among the 12 accidents that occurred in darkness, 10 occurred when there were no street lights in the location, and the street lighting was poor in the remaining two cases.

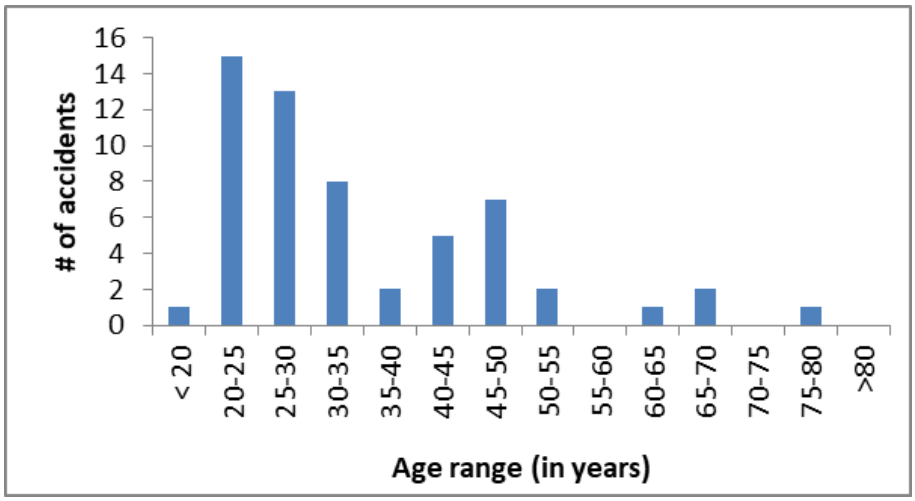

Figure 1: Effect of Driver Age on Accident Propensity

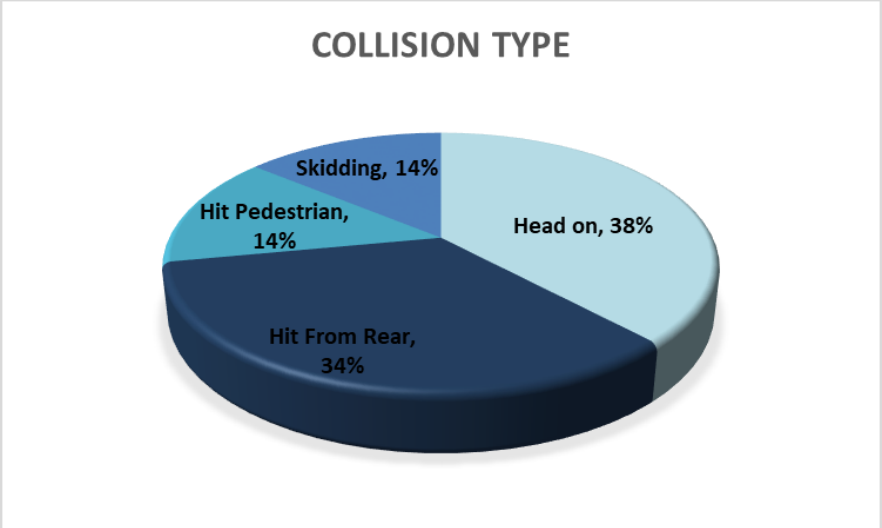

Figure 2: Distribution of Collision Type

3.2 Interaction effect between factors on Accident Propensity

A study of the interaction between the factors led to some interesting findings which are provided as follows.

1. The interaction between junction type and the severity of injury shows that when an accident occurs at a location that in not in a junction, there is a higher possibility that the severity of the injury is minor. Out of the 93 such accidents, 72 resulted in minor injuries (77.4%), 8 resulted in fatal injuries (8.6%) and the remaining 13 resulted in only vehicle damage (14%). However, for the small number of accidents that occur in cross junction (7), the result is either a minor injury (5) or a fatal injury (2). However, a larger data needs to be analyzed before making any solid conclusion on this scenario.
2. In Figure 3, the red, green and yellow dots are used to represent fatal injuries, vehicle damage only cases, and minor injuries, respectively. From the data analysis it can be inferred that no matter the light condition – day light or poor light, if the accident involves pedestrians', chances are that the accident will be fatal. Also when the accident cause is due to high speed and when pedestrians are involved the accident will be fatal.
3. Figure 4 shows that factors such as number of passengers and number of drivers do not have much of an effect on the severity of the accident.
4. Figure 5 depicts the severity of accidents based on the road infrastructure. When the number of lanes is 2 and the roads have cross junction, it can be seen from the analysis

that there is a higher chance of fatal injuries. Similarly, the accidents have been fatal when foot paths are present and the roads have cross junctions. Also, it can be noticed that there are no accident when the junction type is cross junction and central divider is present. However, when central divider is not present at a cross junction, any accident has been fatal.

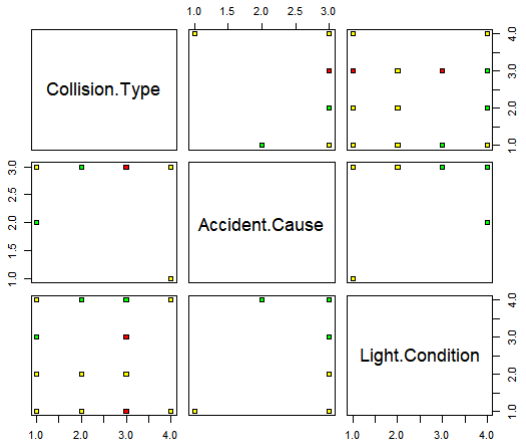

Figure 3: Interaction effect between light conditions, accident cause and collision type

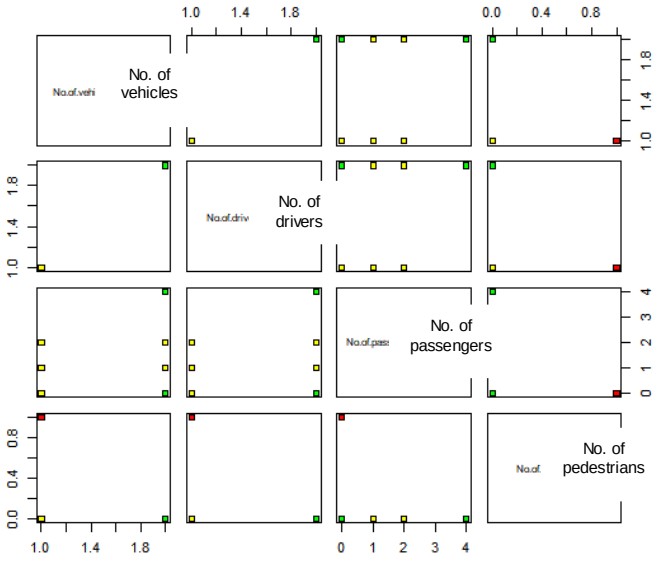

Figure 4: Interactive effect between # of vehicles, drivers, passengers and pedestrians

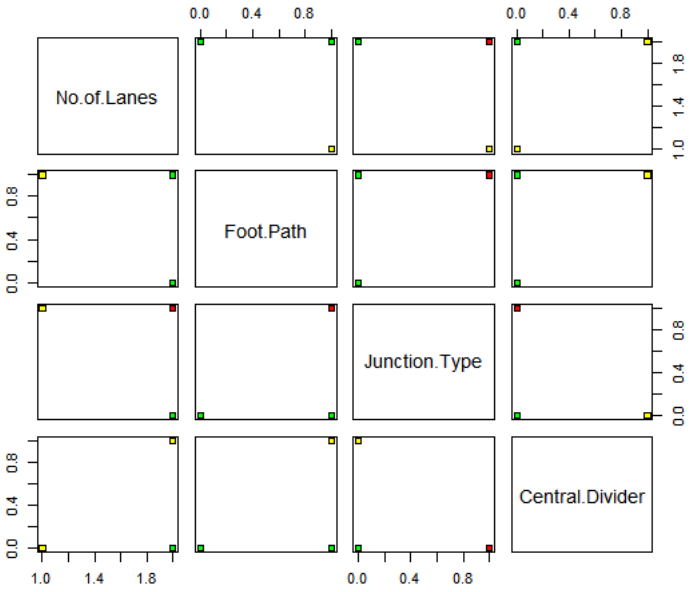

Figure 5: Interaction effect between various road infrastructure factors

3. 3 Location Analysis

The word cloud presented in Figure 6 depicts the accident prone zones in ECR and the size of the text shows the frequency of accidents. The higher the font size, the more the number of accidents in that particular area. The location analysis shows that most of the accidents between 20-08-2018 to 26-05-2019 occurred at Nenmeli and Manamai. The data suggests that Nenmeli accounts for the most accidents (23%) followed by Manamai (18%) and Thiruporur (14%). Together, these three locations account for 55% of the total accidents in the portion of the highway during the duration of the study. Additionally, it was also seen that most of the accidents in Nenmeli happened at a place close to the beach and a religious place. Figure 7 illustrates the bar chart of locations in descending order of the number of accidents.

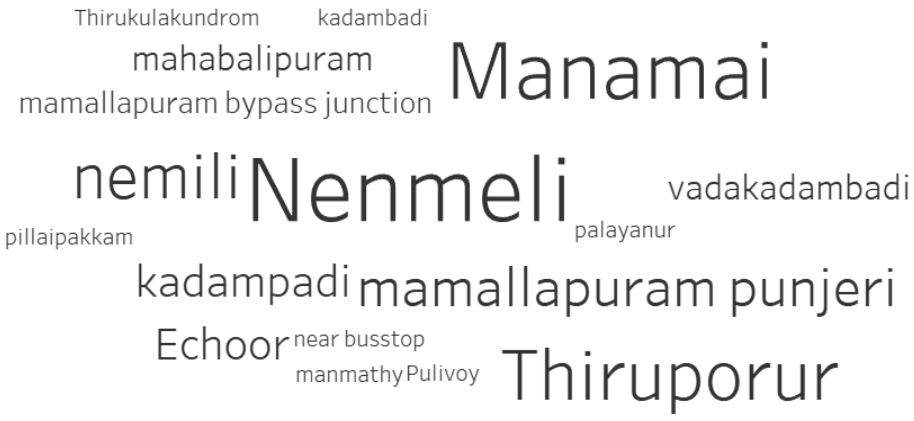

Figure 6: Word cloud showing locations in ECR based on number of accidents

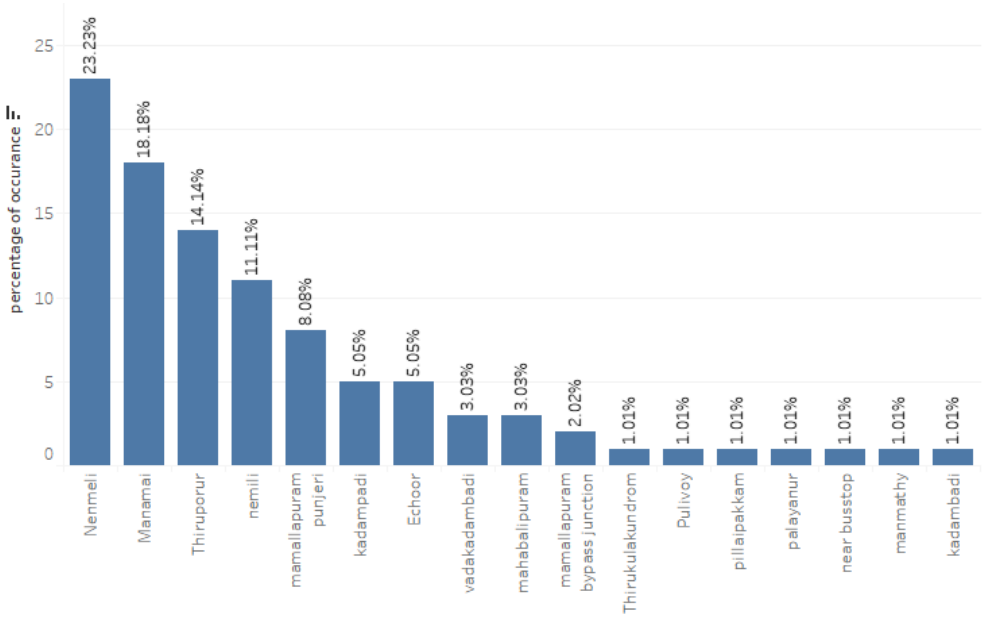

Figure 7: Black-spots in descending order of percentage of accidents

Conclusions

The study analyzes only a small subset of data and presents some useful insights on the accident patterns in a small stretch of SH-49, state highway of Tamil Nadu. At a preliminary level, it helps identify black-spot regions and major contributing factors to accidents in this area of interest. The data on registered accidents was analyzed using R. The study identified that the major cause of accidents on ECR is due to over speeding vehicles. Since ECR is a highway most of the vehicles travel at an average speed of 50km/h to 90km/h. At this speed, accidents could potentially range from serious to fatal. In our analysis, we have noticed minor injuries in most accidents. Further, most of the accidents occurring in different light conditions, especially involving pedestrians led to fatal accidents.

Owing to the small data size, it will be preemptive to make safety recommendations based on the results. However, this work forms the basis for evaluating a larger data set to draw definite conclusions that has the propensity to be modelled for further road accident preventions and recommend much warranted road safety implementations.

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