

Literature Review

This literature review will discuss the evolution of decision making and naturalistic decision making. Further, the literature review will discuss the context of decision making: extreme decision-making in an online scenario. Also, the literature review will discuss choice characteristic and individual characteristic. Finally, the literature review will examine the demographics (education, location, age, income, gender, and marital status) in relation to online decision making.

2.1 Decision Making

Decision making is step by step process for making good decision. Decision making is not a new thing. In the prehistoric time, the rational decision was instructed by religious leaders, group leaders, or by the direction of the star and through the interpretation of their dreams. Time to time different decision-making method, tool and strategies evolved from the fifth century BC to till now. It has been developing to try to improve human decision making. Noble researcher devoted their day and night to understand this process from every perspective like economics, philosophy, psychology, and statistics (Leigh Buchanan & Andrew O'Connell, 2006). In the fourth century BC, People had recognized the role of knowledge, information, and their perception in decision making.

2.1.1 Definition of Decision Making

According to Kreitner (1966), decision making is a process of identifying and choosing an alternative course of action in a manner appropriate to the demand of the situation. The act of choosing implies that an alternative course of action must be weighed and weeded out. Dawar (1998), expressed that "Decision making may be defined as the selection based on some criteria of one behavior from two or more possible alternatives."

2.1.2 Emergence of Decision Making

In 399 BC, decision of Socrates death was taken by the jury, and that marks the history where a decision was taken by an expert panel. In 333 BC, Alexander Great demonstrated the concept of stepwise analysis of the complex problem-decision making. In 49 BC, the idea of irreversible decision came into existence, which means one cannot change a decision once it's taken. Growth of mathematics enabled people to reason their decision, calculate the probability and consequences of risk in decisions.

The researchers believed that the decision-making study came into existence from the time of French philosopher Blaise Pascal. He used a decision-making model expected utility analysis on an existential problem and employed probabilistic reasoning in an uncertain context (Pascal, 1670). After that Bernoulli's (1738/1954) introduced the notion of diminishing marginal utility, in "Exposition of a New Theory of Measurement of Risk," paper and (Bentham, 1879) proposed the dimensions of pleasure and pain, two significant sources of utility (see Stigler, 1950) in book

'An Introduction to the Principles of Morals and Legislation'. They have given the foundation work for decision making, which mainly involved mathematics, reasoning, logic, and economic theory. Classical decision theory, started with Bernoulli (1738) and further (Savage, 1970) and (J. Von Neumann, 1944) added their concept of normative decision analysis (i.e., how ideal people should make decisions, based on logic and reason that people often cannot understand; e.g., expected utility theory) into it.

Further (Edwards, 1954) introduced the psychological viewpoint in the decision, and his idea to study decision from the behavioral perspective was called behavioral decision theory and judicial decision making. He analyzed decision with the help of descriptive decision analysis (i.e., how and why people make decisions; e.g., descriptive method). In addition to that, group and team decision-making perspectives emerged. The term organizational decision making can be traced back to Simon in 1957. Simon introduces the concept of bounded rationality (Simon, 1972). Kahneman and Tversky (1979) introduced the prospect theory to remedy the descriptive failures of subjective expected utility (SEU) theories of decision making which explain how real people *should* and *can* make decisions; e.g., value-focused thinking (Bell, Raiffa, & Tversky, 1988). All these theories are based on expected value (EV) calculations, subjective expected utility (SEU) theory, multi-attribute utility theory (MAUT) and operations research. These are considered too restrictive and not suited for dealing with the complexities of decision making in complex, dynamic, real, and online situations; where decision-makers have multiple objectives and numerous alternatives.

To consider the future scenario or to reduce the previous studies limitation, in 1980 several researchers (Rasmussen, 1985; Cohen, 1986; Beach & Mitchell, 1987) independently began investigating the nature of decision making in a natural setting. According to (G. Klein, 2008) naturalistic decision making (NDM) has developed as one of the major theoretical approaches in decision-making research. NDM emerged initially as an antithesis to the classical decision making; the traditional quantitative approach expressed above.

2.1.3 Naturalistic Decision Making

Naturalistic decision-making means the decision by experts. The decision by an expert is not a new concept in decision history. First-time decision by an expert was happened in 399 BC to send Socrates to his death by jury trial. In today's time, the researcher has decided to leave the rigid and control environment and adopt the natural setting to understand decision making by expert and human experience in their field. Naturalistic decision making is the growing area of psychology and cognitive science in which researchers investigate how individual (Klein, 2008), team and organization (Gore, Banks, Millward, & Kyriakidou, 2006) decide in real life. Where the situation is attributed by following as time pressure, uncertainty, vague goals, high stakes, organizational constraints, team coordination requirements, dynamic environments, ill-structured problems, competing objectives, and data overload (Gore, Flin, Stanton, & Wong, 2015; Klein, 2015; (M. Klein, Sadiki, & Janicka, 2003). Pliske and Klein (2003) defined "NDM as the study of how people use their experience to make decisions in field settings" (Klein & Zsombok, 1997). In addition, Gore and Ward (2017 & 2018) said that, 'naturalistic decision-making research is the tradition which was started in 1980 to study the people who have to work in the field such as aviation, aerospace, banking, energy production and distribution, defense, ground transportation, nuclear, manufacturing, maritime, medicine, oil and gas, and rail make, when the information is partial and not transparent or uncertain'.

2.1.4 Emergence of Naturalistic Decision Making

Naturalistic decision-making study term emerges from the study of naturalistic memory, which is initiated by Ulric Neisser, known as the father of cognitive psychology. The naturalistic mind encompasses everyday memory, autobiographical memory, and practical memory (Gruneberg,

Morris, & Sykes, 1978; Neisser, 1982). By definition, naturalistic decision making is the study of individual experience in decision making in a natural setting. Judith Orasanu in 1980 sped up the NDM movement. He was investigating decision making in natural settings using cognitive ethnographic methods. Also, this movement was recognized after the incidence of Vincennes shot down the Iranian aircraft in 1988. After that, the US Navy initiated its program of naturalistic decision research.

Further, Orasanu and Klein convened a small workshop in 1989 to bring the NDM community together to share ideas and importance of naturalistic decision making. Till now every year the NDM community organized the two-time NDM conference either in the US or UK. Recently fourteen iterations ('NDM14') was hosted in 2019 in San Francisco, with practitioners and academics from across the globe presenting and attending. The main topic of the conference, decision making under uncertainty and decision making for the Internet and consumer decisions—was intended to revisit the primary focus of our self-organizing community of practice (Lave & Wenger 1991), which commenced with a need (and scientific curiosity) for exploring cognition in challenging and complex environments.

2.1.5 Current Studies on Naturalistic Decision Making

NDM is a self-organizing community of practice (Hoffman & Militello, 2012) currently celebrating 25 years of research. Nowadays its models, tools, and techniques have been remarkably applied in domains as diverse as aviation and aerospace, banking, energy production and distribution, defense, ground transportation, nuclear, manufacturing, maritime, medicine, oil and gas, and rail (Gore et al., 2015; Gore & Ward, 2017).

Traditionally, NDM research has focused on decision-making activities 'in-the-heads' of the experts. Stanton (2014) study suggests the future direction of NDM research could be to broaden the focus to include decision-making 'between-the-heads' of multiple agents who contribute to the process, also, which include both human and non-human agents (both artifacts and artificial intelligence) (Gore et al., 2018). Many scientists noted that there are several, evidence from the field of embodied and distributed cognition (Hutchins, 1995) macro cognition (Klien et al. 2003), cognitive systems engineering (Stanton et al., 2017).

Klein et al. (2003) include the following as macro cognitive activities: decision making, uncertainty management, mental simulation, sense-making, situation awareness, attention management, problem detection, planning, and option generation.

Methodological refinements were also evident as researchers continued to report innovation in their use of cognitive task analysis, visual analytics, and technological integration. Attention to sense-making, situation assessment, and further unpacking of metacognition theory and model developments were also highlighted at the conference alongside research in new areas (Gore, Ward, Conway, Ormerod, Wong, & Stanton, 2018). Groenewald et al. (2018) lead the special issue with a unique examination of sense making in British and Belgian police intelligence analysis. Another example of innovation in examining new domains was provided by (Lefford & Thompson, 2018), who discussed naturalistic artistic decision-making and metacognition in the music studio. Similarly, (Militello et al., 2018) conduct the study of the consultations process in the US Department of Veterans Affairs. In this study, he examined the NDM and Macro cognition into the hidden complexities of information flows between primary and specialty care clinics. Militello used the notion of sense-making (G. Klein, Moon, & Hoffman, 2006) to explore how primary care clinicians in the US manage their patients with chronic non-cancer pain. Findings suggest significant ambiguity and uncertainty in clinical pain management help in decision making.

Most recently, NDM and Macro cognition have been applied in submarine command and control (Roberts & Stanton, 2018). In addition to that Suss & Ward (2018) used the cognitive task analysis techniques, (skilled decision making, and expert sense-making) to investigate experience-based differences in police officer decision making in complex, rapidly unfolding, and uncertain situations.

(Shattuck & Miller, 2006) extended the NDM study and proposed a model, which capture both the human and technological components of complex systems into a single model and illustrates how the decision making of a human is influenced by both technical agents and other social agents. The model they propose offers an innovative way to view complex systems in which humans and machines function as cooperative agents. The dynamic model of situated cognition recognizes the unique contributions made by both technology and humans. By employing process tracing methods to track the flow of data through the model, it is easy to determine where the data may have been blocked, how lenses may have been skewed, and how human agents arrived at erroneous perceptions, comprehensions, and projections, which then resulted in poor decisions. However, the model might also be used in a predictive manner. For example, the model could be used to guide system development. Designers who want to maximize system performance need to consider both sides of the model. Klein, Drury, and Pfaff (2012) proposed the Computer-based forecasting models, which can assess dozens of options with hundreds or thousands of variations due to uncertainty. They extended the basis for naturalistic decision making beyond traditional definitions of situation awareness by providing a computer-generated decision space that increases the option awareness. This computer-generated visualization of the decision space enables quick visual comparisons among multiple options simultaneously, which augments mental simulation in recognized prime decision (RPD), even in complicated, uncertain settings. They conclude that by returning processing to perceptual rather than cognitive mental simulation, providing decision spaces and option awareness empirically yields faster, more confident, more robust decisions. Nadav-Greenberg and Joslyn (2009) study state that decision-makers in naturalistic settings make better decisions when they have uncertainty information as opposed to when the report takes the form of a deterministic forecast.

An exemplary study engaging with technology is provided by Parnell, Stanton, & Plant, (2018) which focuses upon the intentions of drivers to engage with secondary tasks during driving on both the road and in a simulator. Researcher report the results of a questionnaire study on cooperative traffic situations which was analyzed from a naturalistic decision-making perspective (Imbsweiler, Stoll, Ruesch, Baumann, & Deml, 2018). Using the NDM approach and the use of recognition-primed decision-making links between planned action and the expected action between road users were identified. It is expected that the findings will complement design recommendations for automatic vehicle guidance systems in cooperative situation scenarios.

Further example of innovation in examining new domains is provided by (Lefford & Thompson, 2018), who discuss naturalistic artistic decision-making and metacognition in the music studio. NDM and Macro cognition have been applied in submarine command and control (Roberts & Stanton 2018). Suss and Ward (2018) used the cognitive task analysis techniques, (skilled decision making, and expert sensemaking) used to investigated experience-based differences in police officer decision making in complex, rapidly unfolding, and uncertain situations. Imbsweiler et al. (2018) report the results of a questionnaire study on cooperative traffic situations which was analyzed from a naturalistic decision-making perspective. Attfield, Fields, & Baber (2018) provide insights into distributed sensemaking—an area which continues to require further theoretical and practical development. Harrington et al. (2018) report the findings of a series of interviews with search and rescue volunteers. The purpose of the above study was to discover types of decisions made during missing incidents; including a consideration of the factors which affect these decisions and the main focuses of

attention throughout the event. According to Mosier et al. (2018) says that NDM study will focus on domain expertise, the importance of emotion and cross-cultural work, extending and considering the method of technology and design complex hybrid ecology, sense-making in the hybrid ecology and multi-team system.

Hoffman and Klein, (2017) insightfully observes that NDM is concerned with how people make decisions in complex real-world uncertain contexts that can require real-time decisions in urgent situations with significant implications for errors. According to Mosier and Skitka, (2018) NDM study will focus on domain expertise, the importance of emotion and cross-cultural work, extending and considering the method of technology and design complex hybrid ecology, sense-making in the hybrid ecology and multi-team system (Gore et al., 2018).

2.1.6 Decision Platform Change

Every form of consumer decision emerges in the form of transaction, or in the way of purchasing. Earlier it happened through face to face at a local shop or mall; which is called offline shopping. With the introduction of the internet in the late 1990s, a platform of decision-making has changed. Earlier we have gone for shopping then only we have to make a decision. Nowadays we have the opportunities to do shopping according to our convenience. It can happen after midnight and early in the morning, without any time limit (Hofacker, 2001; Wang et al., 2005). The Internet provides thousands of options for choice, and then people can make a decision according to their need, want, or desire. It integrates everything in one platform. The most useful characteristic of the internet is that it supports the pre-purchase stage (Maignan & Lukas, 1997) as it helps customers compare different options (Dickson, 2000). E-commerce has made a transaction easier than an offline transaction, and online stores offer consumers benefits by providing more variety of products and services that they can choose from (Lim & Dubinsky, 2004; Prasad & Aryasri, 2009). Consumers can find all kinds of products which might be available only online from all over the world.

According to scientists, the physical reality not only shares certain qualities with the virtual reality (such as uncertainty, ambiguity, availability, and the possibility of variations in options and information to suit individual demands) it even exemplifies these. Resnick (2001) suggested that the online environment could be an excellent platform to explore naturalistic decision making (NDM) processes. (Resnick, 2001) study reports that Recognized Prime Decision (RPD) models can be used to explain e-commerce behavior, but further research is necessary to draw confident conclusions.

Considering the above-mentioned background, it is apparent that the everyday decisions from any small insignificant matter to any important life-changing issue may get impacted due to the amount, variety, and mode of information available to us. The decision-making science studies how environmental factors, decision option characteristics, and individual characteristics influence and determine the process of decision making and the decision made.

2.1.7 Consumer Behavior Research in Indian Scenario

India is one of the most multilingual, the multi-religious and multicultural nation in the world, in every aspect (Venkatesh, 1994). When we try to understand consumer decision making, then various factors influence the diverse nature of choices while making a decision. Specifically, if we talk about individual choice in taking a decision, then different characteristic comes in the forefront. In an article by Ashok Gopal and Rajesh Srinivasan in Harvard Business review in 2006 report says that despite 23 official languages and more than 1,000 dialects, Indian maintains the balance with the art of living. On the other hand, to other parts of the world, this situation seems quite contradictory. Globalization has led to a change in consumer behavior (Gupta, 2011); and new Indian businesses are making Indian consumer behavior even

more complicated by using influencing marketing technique (India Today Web Desk, 2017). According to (Khilji & Rowley, 2013), Indian society is experiencing a complex process of change in terms of educational, economic, political, technological and managerial reforms (Chatterjee & Pearson, 2000). Due to the impact of influencing marketing and new invention in commerce, the Indian consumer has changed, they become more materialistic, and consumerism is becoming the way of their life. Online stores are a form of an organized retail store, and it has been observed that the consumer purchasing decision changes in the shopping environment.

Suranjana Roy (2018) emphasized that the Indian economy is the consumer-driven economy. Also, Boston Consulting Group acknowledges India to become the third-largest consumer economy by 2025. These rapid changes in the consumer market are due to a substantial increase in the per capita income growth. E-commerce spending is also increased, and it is about \$45 billion to \$50 billion a year, and that figure is projected to grow more than tenfold to \$500 billion to \$550 billion by 2025. Therefore, understanding the changing pattern of consumer behavior is essential to predict the economic growth of India.

By definition "Consumer buying behavior defines as the selection, purchase, and consumption of goods and services for the satisfaction of their wants. Engle, Blackwell, and Miniard (2006) have said, "Consumer behavior refers to the actions and decision processes of people who purchase goods and services for consumption". According to Erasmus, Boshoff, & Rousseau, (2001) consumer behavior is influenced by internal and external factors such as demographics, psychographics (lifestyles), personal factors, culture, sub-culture, locality, ethnicity, family, social class, and reference groups. Thus, consumer's online behavior can be understood through the decision-making process of an individual. It is the process by which a person is required to make a choice from various alternative options and it has several stages such as (i) Problem recognition (ii) Problem definition (iii) Product information search (iv) Identification of choices (v) Evaluation of alternatives (vi) Vendor recognition (vii) Vendor selection (viii) Price negotiation (ix) Negotiation of terms and conditions (x) Buying process (xi) more complicated evaluation and (xii) Grievances. These stages are affected by the various factor of individual and choice options.

Several studies have pointed out that, consumers decision-making behavior is influenced by demographic variable like gender (Nagaraja & Girish, 2016), different culture, subculture, social class, membership groups, family, personality, psychological, social and societal environment (Ramya, 2017). The study by (Jain, 2015; Ray & Choudhury, 2015) indicates that lifestyle, motivation, personality, convenience and value delivered to the customer are the major factor which influences the decision of the consumer (Anitha, 2016). Recent researches are investigating the individual and product-wise influence on online decision making. In this direction (Swarnakar, Kumar, & Kumar, 2016) study reports that individual factors such as trust and risk, privacy and security, customer's shopping orientation and website qualities are the most significant factors for generation "Y" to shop online. Also (Richa, 2012) study in online context report influence of demographic factor (age, gender, marital status, family size, and income) in online shopping.

Remarkably technological growth and the government's open economy policy influenced the empowerment of Indian women and the young age cohort. Therefore, the marketer has acknowledged the importance of this demographical part of society. Many researchers are examining the role of women in consumer decision making, and they found a significant result (Siraj, 2013; Altekar & Keskar, 2014). (Ravikanth, Rao, & Ph, 2016) study has identified the influenced of gender in decision making for electronic goods item in the Indian context. They also report that the role of female (as a spouse) and children, has depended on the nature of the product, steps of the purchase decision process, and the sub-decisions related to purchase. In addition to the above finding Kaur, (2014) found the role of family in branded product decision

in Indian consumer. Education is a part of Individual difference, and it also influences the decision making of consumer (Kumar, 2014). Similarly, (Vijayalakshmi & Mahalakshmi, 2013) study report that marketers need to understand the influence of internal and external factors to effectively satisfy the consumers who are differentiated in terms of their decisions.

In online shopping searching and evaluation of information regarding any decision is getting easy through review, blog and customer feedback and many studies have been reported the impact of these on online consumer decision making (Sudha & Sheena, 2017; Devedi, Sujatha, & Pathak, 2017). Utkarsh, Sangwan, and Agarwal (2019) reported the influence of information search in decision making. Their results show that individuals with high confidence in their information acquisition ability have high subjective knowledge and are more likely to search for information for decision making. All the above factor as of now discussed are somewhere related to the demographic variable of the consumer. There are many other factors which also play a significant role in consumer decision-making behavior such as psychological and social variables (Adcock & Bradfield, 1998).

Personality is the combination of character and quality of the individual. Personality types of individuals influence decision making and decision-making style. Loung-poorunder and Das (2015) said that people are people, and the process of decision making is essentially the same all over the world. In the same line (Ravikanth et al., 2016) identified that despite the essential characteristics of consumers, the behavior pattern is more or less similar to each other, mainly in the aspects like quality, preference, and decision making. However other researchers argue that all individuals may follow stepwise decision-making pattern, but the execution of the process is differed due to personality feature. In contrast (Ravikanth et al., 2016) study reported that in reference of electronic product urban and rural consumer has differed in their brand preference and their influencing factor also differs in buying behavior and post-purchase buying behavior. Several studies are available which provide the literature that personality has an influence on decision making and attitude behind the decision-making style (Huitt, 1992; Parker & Fischhoff, 2005; Ahmed, Hasnain, & Venkatesan, 2012).

In the Indian context (Loung-poorunder & Das, 2015) has examined the relationship between decision-making style and personality. This study identifies consumer's decision-making styles towards the purchase of electronic goods, namely, Mobile phones, Laptops, etc. in Chennai city. Similarly, (Dhar & Dubey, 2014) study reported six decision-making styles (recreational and hedonistic consciousness, perfectionism consciousness, confused by over choice, habitual and brand loyalty, price and value awareness, and brand and fashion consciousness) in the Uttar Pradesh young consumer for casual ware decision. Also, Rani, (2014) indicated that purchase behavior had been influenced by personality; she has also suggested that the nature of influence varies as per the age of the individual. Similarly, (Khan & Chawla, 2015) study reports the impact of age and age-wise personality influence in decision making in the organized retail sector of India. They also report the importance of gender of an individual on the consumer purchase decision. Badgaiyan & Verma (2014) studied the impulsive buying behavior of a consumer in context to materialism and shopping enjoyment construct. Their result reported that there is a positive and significant relationship in impulsivity and materialism with shopping enjoyment. Many study studies have been done on decision making about a different product like electronic, and television (Kumar, 2011; Ravikanth et al., 2016) along the same line.

2.1.8 Summary

The Naturalistic Decision-making (NDM) framework, which emerged in 1989, tries to study decision making in the real world. The literature in NDM is quite rich by now, and application of this approach in consumer decision making could gain insight, which will be generalizable to other areas as well. Considering that the present workplace itself in amidst of information

processing complexity and consumer decision making; the literature provides significant directions and conclusions. Few relevant and established directions are:

I. Directions

- The India consumer online decision studies so far are broadly focused on individual factors such as trust and risk, privacy, and security, (Swarnakar et al., 2016).
- The influence of demographic factors in online decision-making context is marked (age, gender, marital status, family size, and income) (Richa, 2012).
- Studies are available which provide the literature evidence that personality has influence decision making and attitude behind the decision-making style (Huitt, 1992; Parker & Fischhoff, 2005; (Ahmed et al., 2012).

Gap

To best of my knowledge, till now, researchers have explained decision through the lens of decision style. There is a need to study the decision-making process step by step.

- There is a need to examine specific personality factor which influences information processing and decision making of individuals in the Indian scenario.
- There is a need to understand the context effect of the decision through the amount of information available.
- There is a need to validate the findings with methodological triangulation.

2.2 Context Effect

A context effect is an aspect of cognitive psychology that describes the influence of environmental factors on one's perception of a stimulus. It can impact our daily lives in many ways, such as word recognition, learning abilities, memory, and object recognition. Across many disciplines such as law, economics, psychology, marketing, and organizational behavior, studies of context effect have been done aggressively. Now it is widely accepted that choices are susceptible to contextual influences (Tversky & Simonson, 1993; Kelman, Rottenstreich, & Tversky, 1996; Chernev, 2004; Griffin, Liu, & Khan, 2005; Thomadsen et al., 2018). Thomadsen et al., (2017) provide the formal definition of context effect "contexts as any factor that has the potential to shift the choice outcomes by altering the process by which the decision is made." Further (Ben-Akiva et al., 2012) highlight the importance of considering choice as an interaction between the choice process and the choice context. Definition of context effects refers to the influences of the surrounding environment on perception.

In addition to that, according to life history theory, no two individuals are the same, the decision of different individual may get influenced differently by the various context dependence factor. Simonson and Sela, (2010) commented that innate differences of individual might reflect in the form of heterogeneity in context effect. The context is common knowledge in marketing, and thus marketer tries to study context effect from every perspective for every decision. Contextual cues are changed by changing the product external environment like changing the product order, size, display sets, etc. For example adding to the evidence of

context effect John, Donnelly, & Roberto, (2017) study reported that two contextual factors – cup size and service style which influence the consumers' purchasing and consumption of sugary drinks.

2.2.1 Factor influence the Context Effects

The early context effect studies (e.g., Goldberg & Gorn, 1987; Kamins, Marks, & Skinner, 1991) examined the influence of television ads and magazine ads on individual decision. Many studies have focused on the exogenous factor of context effect (G. Huang, Khwaja, & Sudhir, 2015) such as the composition of choice set (compromise effect), display of choice set (end-of-aisle show), different environmental cue and so on. Similarly, studies have been done on context effect and memory and cognition (Barsalou, 1982; Smith & Vela, 2001). Barsalou (1982), Smith and Vela (2001) identified that context effects are endogenous as well. In this line (Neal, Wood, Labrecque, & Lally, 2012) study has reported that contexts influenced the habits which illustrated with a cognitive decision task.

2.2.2 Current Studies on Context Effect

Context effect studies were not limited to the composition of choice set only many researchers study context effect more broadly to embrace different aspect/context of life such as social context e.g., joint vs. individual consumption (Wakefield & Inman, 2003), situational context e.g., occasions/activities which activate different needs/goals (G. Huang et al., 2015), and interruptions to the choice process (Liu, 2008). There are studies which report the impact of situational influences on eating behavior (Chandon & Ordabayeva, 2009; Cheema & Soman, 2008; Geier, Wansink, & Rozin, 2012). Gardete (2015) identified social context effects by observing airline purchases of individuals. Recently (Thomadsen et al., 2017) research on context effect included the different social aspect (e.g., with friends or family) and situational factors (e.g., location (home/store), time, and weather. Further studies report individual choice process getting dynamically influenced by behavior (Marshall 2014), geographic mobility (Ghose & Han, 2011), location (Molitor et al. 2014), location and time at which they receive a promotion (Luo et al. 2014), and product characteristics (Bart et al. 2014). Also, scholars have found that for mobile display advertising, products higher on involvement and utilitarian dimensions impact as a context in individual purchase intentions (Bart et al. 2014). Recently (C. Li, Luo, Zhang, & Wang, 2017) study provide evidence that different weather condition plays an essential role in Purchase Intention. Their study found that consumer purchase response has increased in sunny weather, but the decrease in rainy weather, relative to cloudy weather. Huang et al. (2016) also believed that all the above-mentioned studies influence the habit and other automatic processes to impact choice.

Further context effects have been demonstrated in a wide range of high-level decision-making tasks, such as choices among consumer products (Huber, Payne, & Puto, 1982; Pettibone & Wedell, 2000), in situations including real in-store purchases (Doyle, O'Connor, Reynolds, & Bottomley, 1999), among candidates for scholarships (Tversky, 1972), in elections (Sue O'Curry & Pitts, 1995), among gambles (Tversky, 1972; Wedell, 1991), in likelihood-judgment problems (Windschitl & Chambers, 2004), among the selection of mates (Sedikides, Ariely, & Olsen, 1999), and in inference problems (Trueblood, 2012).

Thomadsen et al. (2017) explored the choice process of context effect in which decision-makers engage. They accepted the premise that Psychology reasoning models suggest that (Evans, Handley, & Harper, 2001; Trippas et al., 2018) the context can influence System 2 as well as System 1 processing. System one is involved in the quick decision-making process, and system two is involved in a slow and deliberate decision-making process. Their study concluded that every behavioral shopping aspect does not represent the context effect. Specifically, "aspects of the choice environment that merely affect the preferences for the underlying attributes of the product (or choice alternatives in non-product settings) would not be considered context effects

but, aspects of the choice environment that move a person from using a utility maximization-based choice method to an emotionally driven choice method would be considered as contexts". Meyers-Levy & Sternthal (1993) says contextual cue is established by the retail establishment for their favorableness. This contextual cueing may lead to a similar decision process in individual (Sela & LeBoeuf, 2017). Marketer embodied the contextual environment, which impacts individual memory and cognition (Barsalou, 1982). They build the tendency and habit to rely on, and it is so strong that effects have been shown even when the additional option is dominated (Huber et al., 1982) or unavailable (Hedgcock, Rao, & Chen, 2016; Simonson 1989).

Now there are different ways available to accurately measure the contexts effect. For example, we now have the ability to have subjects wear technology that can measure many aspects of the area and provide us with information about the location (Molitor et al. 2014), immediate surroundings (Ghose & Han, 2011), where they are when they make decisions (Andrews, Luo, Fang, & Ghose, 2015), and the weather conditions they face (Li et al., 2017). Hedgcock and Rao (2009) used the fMRI machine to understand the context effect study the neurobiological underpinnings of the attraction effect (another type of composition of choice set).

As many people have adopted wearable technology that can measure these things, it will enable researchers to start measuring these effects without having their measurement (and therefore their presence) be salient to the subjects, allowing to get an undistorted view of what is driving choices (since the known presence of such devices in itself may lead to context effects). Recently, several studies have estimated context effects by using field experiments to generate useful exogenous variation (Gneezy, Gneezy, & Lauga, 2014; Sudhir, Roy, & Cherian, 2016). Hutchins (1996) believes that "boundaries between individuals and context should be softened. It may be that to understand NDM error more fully, both background and cognition need to be examined. One such context effect in decision making is the effect of the sequence of presentation or sequence of display of choices on the decision being made, termed as an extreme effect.

From a social engineering point of view, if one wants to create nudges to get consumers to take actions that are good for them (such as saving or eating healthier) then one needs to understand which contexts will nudge people in which ways (Ratner et al., 2008). Thus, understanding the role of context on choices is very important to a wide range of researchers.

The context surrounding naturalistic decision-making is seen as increasingly important (Lewandowsky & Kirsner, 2000; Orasanu, Ames, Martin, & Davison, 2001; Schliemann & Carraher, 1992). Choice set availability could form a context effect to the extent that it influences choice by changing the relative position of options, as opposed to their absolute attribute values. For example, changes in choice set availability that affects choice by shifting which products are in the middle of the pack (i.e., become compromise options) (Simonson, 1989) would be considered a context effect. Its extensive study has been done on marketing and consumer decisions. Similarly, the effect of the sequence of presentation or sequence of display of choices by shifting which products are towards the end of the pack on the decision being made termed as an extreme effect.

In the preferential choice literature, three effects have been central to research on contextual sensitivity: the attraction (Huber et al., 1982), similarity (Tversky, 1972), and compromise (Simonson, 1989) effects.

2.2.3 Extreme Effect: Aversion and Seeking

Decision theorists, consumer psychologists, and marketing practitioners have long been interested in how the make-up of an assortment impacts consumer choice (Payne, Bettman, and Johnson 1992). Extremeness effect, i.e., extremeness aversion and extremeness seeking, are the

most researched topic within this area. Research on extremeness aversion (also termed compromise effect) deal with choices consumers makes when faced with high end, mid-market and low-end product that are comparable on ascertain attribute. According to (Luce 1977), "classical rational choice theory suggests that the choice makers select an alternative that has a maximum value." It is also established that context of other options also influences the decision to construct (Tversky 1972; Huber et al. 1982; Simonson 1989; Pan & Lehmann 1993; Hedgcock et al. 2016). Extremeness aversion (Simonson 1989) is one of the most discussed phenomena in consumer behavior literature (Neumann, Böckenholt, & Sinha, 2016). It has been found robust in business-to-business and complex buying situations (Dhar, Menon, & Maach, 2004; Kivetz, Netzer, & Srinivasan, 2004), dyadic decision making (Nikolova & Lambertson, 2016; Boldt & Arora, 2017), and even in low-level decisions (Trueblood et al. 2013).

Extreme aversion (Compromise effect), introduced by Simonson in 1989, is one of the best-known context effects, and most research has been done on violations of the independence of irrelevant alternatives (IIA) and the similarity effect (Tversky 1972) that are axioms of the rational choice theory (N. Neumann et al., 2016). According to IIA, the preference between two alternatives is independent of the presence of other options in the choice set. According to the similarity effect, a new alternative substitute choicer share from a similar option (Tversky 1972). Regularity condition is another axiom core to the rational choice theory that states that the free choice share of a substitute in a choice set cannot be increased by the addition of another alternative in the choice set. Whereby in compromise effect the percentage of a replacement is enhanced when it becomes an intermediate option in a choice set and diminished when it becomes an extreme option (Kivetz et al., 2004; Simonson 1989; Simonson and Tversky 1992).

(Neumann et al., 2016; Simonson & Tversky 1992) defined compromise effect (or extremeness aversion) as a consumers' tendency to avoid extreme options in a choice set, instead of showing stronger preferences for the middle, compromise alternatives. Their recent meta-analysis of 142 experiments showed that this tendency appears as robust across many contexts, study designs, and participant types.

Time to time the different researcher explained the compromise effect differently, e.g., Huber and Puto, (1983) believed that for risk-averse consumers, a compromise alternative viewed as a safer choice than the extreme options. According to Bettman, Luce, and Payne (1998), the compromise effect is related to constructive preferences. Whereas Simonson (1989) believe that it becomes stronger when consumers are concerned about others' evaluation of their decisions because compromise options are seen as "less likely to be criticized." (Sheng, Parker, & Nakamoto, 2005) illustrate compromise as a choice which minimizes the conflict and natural to justified to others. Many researchers have been studying (e.g., Benartzi & Thaler, 2002; Dhar & Simonson, 2003; Simonson & Nowlis, 2000; Kivetz, Netzer and Srinivasan 2004; Sharpe, Staelin, & Huber, 2008; Geyskens, Gielens, & Gijsbrechts, 2010) this effect in a more encompassing manner which includes different products such as soft drinks, computers, apartments, investment portfolios, and private levels.

Similarly, Sharpe et al. (2008) study shed light on how the compromise effect changes consumers' choice of soft drinks from smaller to bigger sizes. Study conduct by (Yoo, Park, & Kim, 2018) identified the significant impact of considerable choice set size (small vs. large), extremeness effect (weak vs. strong) on compromise effect. Their result reported that in the weak extremeness condition, where product involvement level is low, the compromise option is chosen significantly less as the consideration set size increases. Whereas, in the strong extremeness condition, where product involvement level is high, the compromise option is selected majority of the time, even when the size of the consideration set increases.

Interestingly, their finding shows that the number of individuals seeking extreme opportunities increases significantly as the size of the account set increases. Also, they report that perceived choice difficulty strength the compromise effect. Recently (Jungkeun Kim, Hwang, Park, Lee, & Park, 2018) focused on the impact of display of the product on people selecting a middle option or edge option. They provide the idea that from the horizontal display (vs. vertical display) of the product most choosing option is the middle option then edged option. This study shed light that horizontal display strength the compromise effect, and the vertical display will strength the extremeness effect. Also (Padamwar, Dawra, & Kalakbandi, 2018) concluded that the exact center position of the product strengthens the compromise effect when choice contains three products.

It is clear from the literature presented above that the compromise effect is robust phenomena in the consumer behavior literature, showing the substantial magnitude and replicability across a range of approaches (Kivetz, Netzer and Srinivasan 2004), stimuli (Chernev 2004; Dhar and Simonson 2003; Drolet, 2002; Simonson and Nowlis 2000; Simonson 1989) and in both real and hypothetical choices (Müller, Vogt, & Kroll, 2012).

It has significant managerial implications in product line extension, product positioning, promotions, branding, and other competitive strategies (Simonson and Tversky 1992; Kivetz et al. 2004; Geyskens et al., 2010). For sure many companies like Xerox boosted their sales by applying this compromise effect context (Gourville & Soman, 2007).

However, these studies are criticized for not including the characteristic of a real-life scenario. Lichters, Sarstedt, & Vogt, (2015) reviewed the 30 years of 47 compromise effect studies which showed that such context effect studies mostly rely on hypothetical choices that do not entail real economic consequences and use imaginary items or unrealistic product descriptions. They also conclude that researchers should consider the context effects, such as the compromise effect, “from a perspective that takes them basic conditions of real-world settings into account” and that “future research should systematically evaluate the effects of the identified background factors.” They also identify that all the previous studies concerned about the mechanisms that drive the compromise effect (Simonson, 1989), whereas more recent studies have focused on the factors that influence its strength (Chuang & Yen, 2007; Dhar et al., 2000; Dhar & Simonson, 2003; Sheng et al., 2005; Simonson & Nowlis, 2000). For example, the uncertain environment can strength the extremeness aversion (Sheng et al. 2005). Along with the above study (Pinger, Ruhmer-Krell, & Schumacher, 2016), they use the natural environment in their research to understand the compromise effect in more detail.

2.2.4 Factor influence Extreme Effect: Avoidance vs. Seeking

In contrast, to focus on only external factors, few researchers have conversed their focus towards the personality and cognitive tendency of the individual, which impact as an endogenous factor on context effect during decision making. The endogenous factor here refers to the individual character and cognitive biases. Bettman, Luce, and Payne (1998) concluded that personal traits based on one’s own experience and familiarity influenced the context effect; (Sheng et al., 2005) also supported this finding. They explain that the more familiar an individual is with the product, the less likely he or she will choose the middle category option.

(Huber & Puto, 1983) informed about risk-averse tendency people mostly chose compromise or middle option product because they perceive the middle option as a safe option instead of high end or extreme option. Simonson and Nowlis (2000) reported that consumers who have a high need for uniqueness are less likely to select a compromise option and show the compromise effect. Similarly, (Dhar & Simonson, 2003) explained that when the consumer is uncertain about their exact preference, then they chose a compromise option. The same conclusion is drawn by (Pinger et al., 2016). Chernev (2004) demonstrates that the balance of attribute values within

each alternative moderates the compromise effect. In addition to the above research Simonson and Tversky (1992), Chernev (2004), Sinn et al. (2007) report that the individual who are willing to take the risk, chose an extreme option instead of choosing the middle option.

Till now many studies have demonstrated the impact of various moderating factors on extremeness aversion and extreme seeking, such as need for uniqueness (Simonson & Nowlis, 2000), consumer uncertainty (Dhar & Simonson, 2003), balance in product attribute (Chernev 2004) and risk factor Sinn et al. (2007). In addition to these, maximization tendency (Mao, 2016), regulatory fit (Levav, Heitmann, Herrmann, & Iyengar, 2010), choice deferral (W. M. Hedgcock, Rao, & Chen, 2016a), brain serotonin levels (Lichters, Brunnlieb, Nave, Sarstedt, & Vogt, 2016), massive choice sets with sophisticated alternatives characterized by more than two attributes (W. M. Hedgcock et al., 2016a), recommendations (Chuang et al., 2012) and time pressure (Dhar et al. 2000) also influence the context effect.

2.2.5 Deferral Decision

Delayed purchase is a prevailing attitude when consumers buy goods. For the sake of maximizing profit or decision-making optimization, consumers often want to consider all possible choices before making a purchase decision. However, due to cognitive limitations and increased search costs, consumers are often unable to make a complete estimate of all commodities, they will feel the conflict, weigh the difficulties, and may delay the purchase.

Consumers defer choice when they postpone or delay selecting an option from available alternatives (Anderson 2003; Dhar 1996, 1997; Greenleaf & Lehmann, 1995). The famous psychologist William James (n.d.) is reported to have said, "When you have to make a choice and do not make it, that in itself is a choice," this choice is called deferral choice or choice avoidance. Dhar, (1997) defined delayed purchase refers to products that consumers have a clear intention to purchase when they can pay, but they prefer to buy later. Rational-Emotional model (Anderson, 2003) explains the reason why consumers deferred in the decision, the cost of action and conversion, expected regret or responsibility, and decision-making difficulties can lead to consumer delayed. Decisions in a real environment would always involve the alternative of not choosing (Dhar, 1997; Dhar & Simonson, 2003; J. R. Parker & Schrift, 2011).

2.2.6 Factors Influencing the Deferred Decision

Literature suggests that deferral decision or choice deferral could occur due to multiple reasons, e.g., time pressure, information overload, preference uncertainty, entropy, etc. According to Simonson (1992), people choose no choice (deferral decision) option to minimize the loss or to reduce the level of regret that is subsequently experienced. Anderson (2003) also concluded that the difficulty of choosing among a set of provided options is a common reason for choice deferral. According to Dhar (1997), consumers may delay the decision to search for more information, the expectation of a better option in the future (Kramer, 2010). Similarly, Malhotra (1982) reported that the choice preciseness would fall when the number of options increased from 5 to 10 or when the number of attributes varied from 10 to 15, and it would become stable after these thresholds. Additionally, sometimes, consumers want to delay their decision to think over or consult the issue, less confident to choose or to make others believe that they are carefully deliberating (Tykocinski & Ruffle, 2003). In addition to the above finding (Tversky & Shafir, 1992), choice conflict is also the reason to deferred in the decision. This happens to cases like equally attractive rather than the inferior alternative is added to a choice set (Dhar, 1997), if choice set is presented simultaneously than sequentially (Dhar, 1996), too many options rather than limited options (Iyengar and Lepper, 2000), a trade-off between emotional attributes (Luce, 1998), and a subjective feeling that forming a preference is difficult, such as the font is difficult to read, or the participants are asked many reasons for their choice (Novemsky et al., 2007).

Prior work on the antecedents of choice difficulty and deferral has primarily focused on structural aspects of the choice set. For example, choosing from a more significant number of options (Carmon, Wertenbroch, & Zeelenberg, 2003; Iyengar & Lepper, 2000; Sela, Berger, & Liu, 2008), from more varied assortments (Chernev 2006; Huffman & Kahn, 1998; Townsend & Kahn, 2013), and from choice sets that lack acceptable alternatives (Ratchford, 1982; Stigler, 1961; Weitzman, 1979).

Some of the recent studies concluded that identified processing disfluency and metacognitive difficulty (Novemsky et al. 2007; Schrift et al. 2011; Sela and Berger 2012), mental abstraction (Kim, Khan, and Dhar 2013; Xu et al. 2013), and uncertainty regarding option (Greenleaf & Lehmann, 1995; Dhar, 1997; Gunasti & Ross, 2008) can impact choice difficulty and deferral.

The influence of emotions on decision making is another significant dimension. Isen and Means (1983) suggested that positive mood and positive attitude improves decision making by helping consumers process information more efficiently, ignoring unimportant information and focusing on what is essential, whereas, Luce (1998) suggested that emotional trade-off difficulty may lead to deferral decision. This line of findings is supported by studies by Etkin and Ghosh (2017); Meloy, Russo, and Miller (2006); Lewinsohn and Mano (1993).

In respect to an online platform, Cho et al. (2006) found that compared with consumer characteristics (e.g., attitude toward consumer shopping), contextual factors (e.g., time pressure), and channel/ medium innovation factors (e.g., privacy infringement) – “perceived uncertainty factors provided the most explanatory power for online shopping cart abandonment [i.e., choice deferral]”. No choice option encourages more evaluative judgments and increased importance of attributes that performed close to consumer thresholds (Parker & Schrift, 2011). Task effects also influence the likelihood of choice, with the time pressure decreasing the choice deferral in scenarios involving high conflicts or a selection among options with unique good attributes (Dhar & Nowlis, 1999; Dhar & Sherman, 1996) increases. Shah & Wolford (2007) asked subjects to evaluate sets of pens, with set sizes ranging from 2 to 20 pens. After their evaluation, the subjects were given the choice of whether or not to purchase one of the pens at a discounted price. They reported that the choice deferral had a curvilinear (inverted U) relation with the number of pens in the set, decreasing in up to 10 options and increasing after this optimal point. The choice deferral will first reduce when the number of options varies from small to medium, and it will increase when the number of options ranges from medium to large.

A recent study (Krijnen, Zeelenberg, & Breugelmans, 2015) pointed to the idea that people use decision importance as a cue for deferral. People assume difficult decisions to be essential and important decisions to be complicated. It may be possible that people defer because deferral provides more flexibility and leads to more information or better alternatives (Shin & Ariely, 2004). Sense of importance of decision arises from perceptions of decision difficulty (Sela & Berger, 2012) and understanding of decision difficulty was closely related to the combined importance of the attributes under consideration (Beattie & Barlas, 2001). Whereas (Krijnen et al., 2015) also report that deferral of the critical decision was independent of choice set composition. Also, they found that people would defer important decisions more in situations where there is a single alternative available or where there are two conflicting alternatives. However, in the case of a clear dominant option, studies report decreases in the deferral in an important decision. In the same line (Dhar, 1997; Tversky & Shafir, 1992) study found that people may defer from essential decisions because they involve complex choice sets with conflicting alternatives (Tian, Li, & Chen, 2018). Larasati and Yeh (2016) showed that if there are attractive product in choice set it will not always reduce choice deferral, additionally there is interaction in type of consumers and type of product attributes for deferral decision. Huang, Su, and Chang (2015) found that high levels of between-alternative conflict were associated with framing effects and that high levels of between-alternative conflict were moderated by

including the no-choice option in the choice set. Taken together, these two studies demonstrated that the inclusion of a no-choice option provides an alternative way of resolving difficult choices regarding decision frames that are not available when individuals are forced to choose.

There are many factors that cause consumers not to take purchase action. Through comprehensive investigation and analysis of relevant research results, factors affecting consumers' delayed purchase are divided into macro factors and micro factors. Macro factors include market factors (expectations, risks, uncertainties, etc.), product factors (categories of products, price changes, renewal, etc.), cultural factors (thrift habits, etc.) The micro factors are summarized as cognitive factors, emotional factors, and personal consumer traits: age, characteristics, and individual differences (Jin, 2018).

The deferral purchase decision creates a threat to the immediate sales of enterprises, retailers, and so on. No choice option weakened the compromise effect (Dhar & Simonson, 2003). Some of the recent studies combined micro-macro and other factors. Gerasimou (2017) examined the three specific reasons why decision-makers may defer choice: 1) indecisiveness between various feasible options, 2) the unattractiveness of these options, and 3) choice overload. The study reported that all three are a significant predictor of deferral decision. Exploring a completely new factor, Li, Ye, & Yang (2017) revealed that increasingly submissive decision environments were related to more choice of deferral options. Also, indicate that dominance plays an important role in choice deferral and that choosing to defer can minimize the explicit confrontation of being out of control. From the previous study, it comes to know that deferral decision occurs due to difficulty in a decision, complexity between option, too many options, and similarity between the option, etc.

Along with this (Zijlstra, Goos, Vanoutrive, & Verhetsel, 2015) examined deferral choice in discrete choice experiments. They used the online data, and the result showed that people tend to use no choice option more often if the options are not of their interest. Also, their study does not support the previous finding, related to the role of choice complexity in deferral. Bhatia and Mullett (2016) outlined the eight behavioral findings regarding the causes and consequences of choice deferral that cognitive theories of decision making should be able to capture. This study used a time limit applied to sequential sampling models of multi-attribute choice (initially proposed by Jessup et al., (2009). According to mechanism that decisions that are made slowly are more likely to be deferred, and that allowing for choice deferral increases the choice proportion of options that are favorable early on in the decision. Thus, Product attribute alignability and non-alignability are the significant contributors in extreme effect, and deferral decision making is the across choices in a set.

2.2.7 Summary

The definition of context effects refers to the influences of the surrounding environment on perception. The literature in context effect is quiet rich by now, and the application of this approach in consumer decision making could gain insight, which will be generalizable to other areas as well. Considering that the present work position itself in amidst of information processing complexity and consumer decision making; the literature provides significant directions and conclusions. Few relevant and established directions are:

II. Directions

- The consumer decision is broadly categorized as extremeness seeking/aversion decision and deferral decision (Xie & Mattila, 2011)

- (Pinger et al., 2016) use the natural environment in their research to understand the compromise the effect in more detail.
- Researcher divide the factor of deferral decision into macro factors include market factors (expectations, risks, uncertainties, etc.), product factors (categories of products, price changes, renewal, etc.), cultural factors (thrift habits, etc) and the micro factors are summarized as cognitive factors, emotional factors, and personal consumer traits: age, characteristics, and individual differences (Jin, 2018).
- Increasing middle option (up to 5-8) increases preference certainty (Pilli & Mazzon. 2016).
- Increasing the middle choice option lead to extremeness seeking effect. (Gourville & Soman, 2007). Too many options can create information overload and hence, deferral decision making (Pilli & Mazzon. 2016).
- Information load literature most of the studies have examined the role of the number of options or the number of attributes.

Gap

- How and when increasing option leads to extremeness seeking effect or deferral decision is not clear yet.
- To study the context effect researcher mostly rely on hypothetical choices that do not entail real economic consequences and use imaginary items or unrealistic product descriptions (Lichters, Sarstedt, & Vogt, 2015).
- So, there is a need to understand the cognitive and personality factor in deferral decision making.
- There is a need to explore the independent role number of options or the number of attributes variables, as well its interaction pattern.
- Information overload, a significant determinant of choice deferral, is only described using fix number of attribute and options (Pilli & Mazzo, 2015; Neumann, Roberts & Morrison, 2009; Xie & Mattila, 2011). So, there is a need to understand the influence of increasing information (no. of option and attribute).

2.3 Choice Characteristic

One of the significant contributors in extreme effect in decision making and deferral decision making is the alignability and non-alignability of attributes across choices in a set. Alignable attributes are characteristics which are shared by all the alternatives and increase comparability, whereas, non-alignable attributes are characteristics which are not shared by the other options and are a unique component of choice.

2.3.1 Alignability

Markman and Medin in 1995 introduced the idea of alignability, and later, it is divided into category alignable and non-alignable (Markman & Lowenstein, 2010; Markman & Medin, 1995). Also, Gourville and Soman (2007) introduced alignability as an assortment type which may potentially significantly influence consumer choice. Further, the study by (Xie & Mattila, 2011) explained the role of alignable attributes in creating extremeness aversion (compromise effect).

Alignable attributes are characteristics which are shared by all the alternatives and increase comparability, whereas, non-alignable attributes are characteristics which are not shared by the other options and are a unique component of choice. According to (Neumann, Roberts & Morrison, 2009; Xie & Mattila, 2011), the role of non-alignable attributes in creating extremeness seeking is significant. Alignable attributes consist of attribute levels that vary along with a single comparable dimension (Markman & Medin, 1995; Zhang & Fitzsimons, 1999), the attribute is a continuum and products take on distinct values along with it. For example, the percentage of cocoa in chocolate bars (50, 60,70%, etc.), the alcohol content in beer (4, 5, 6%, etc.), or the number of megapixels in a camera (4, 8, 10, etc.) are examples of alignable attributes and non-alignable attributes consist of non-related dimension or (Gourville & Soman, 2005) within multiple aspects that have no correspondence with each other (Markman & Medin, 1995; Nam, Wang, & Lee, 2012; Zhang & Fitzsimons, 1999).

2.3.2 Current Studies on Alignability

The concept of attribute alignability has direct relevance for customers' decision making. According to Zhang and Fitzsimons (1999), alignable dimensions arrive at the preferred product more readily than those that are challenged by attribute non-alignable. This is because the cognitive and effective efforts which individuals undergo to make a choice decision for a particular option are more considerable for products with non-alignable attributes than for those with alignable features (Gentner & Markman, 1994). Also, Herrmann, Heitmann, Morgan, Henneberg, and Landwehr, (2009) showed that with an alignable assortment, individuals choose faster, have a greater willingness to pay, and higher levels of satisfaction. They show that an increase in assortment size is positively evaluated when attributes are alignable, but negatively when they are non-alignable. Alignable characteristics allow consumers to compare attribute levels based on a standard dimension. Considering this reason, alignable attributes are more comfortable to compare (Gourville & Soman, 2005; Markman & Medin, 1995; (Zhang & Fitzsimons, 1999).

The concept of alignability has proved to be useful in understanding the difficulties associated with assortment perceptions and choice (Herrmann et al. 2009; Markman and Medin 1995; Zhang and Markman 2001). Alternatives characterized of non-alignable attributes may result in the error of information (Zhang, Kardes, & Cronley, 2002), in less complete decision making, and consequently in an increased level of regret when the comparability is high (i.e., alignable attributes). Consumers can easily search (Zhang & Fitzsimons, 1999) for an optimal product, and thus select a more massive assortment (Gourville & Soman, 2005). Considering these reasons, consumers can more easily choose an optimal option based on alignable attributes rather than non-alignable attributes (Markman & Medin, 1995). In other words, consumers select products based on non-alignable characteristics if they find the attribute important enough to be motivated to process the information regarding the non-alignable attribute in question (Zhang & Markman, 2001).

Gourville and Soman (2005) are among the few who have studied brand lines. They showed that the share of choice of a brand decreases as a number of its products increases when its attributes are non-alignable. Moreover, alignable information is considered as more valuable and useful to evaluate products than non-alignable information (Gentner and Markman 1994; Markman and Gentner 1997; Zhang and Markman 2001). (Kahn & Lehmann, 1991) showed that consumers prefer varied assortment, even when they contain products which are individually less preferred. While these researches suggest that alignable and non-alignable attributes are processed differently, some recent research has begun to identify that consumers' preference between two options may depend upon the nature of the product (i.e., services) (e.g., Sun et al. 2012).

Based on the assortment type distinction, Gourville, and Soman (2007) argued that the compromise effect (or extremeness aversion) had been demonstrated using alignable assortments only, whereas, non-alignable assortments consumers will display a form of behavior they call extremeness seeking. Extremeness seeking (as explained in the previous section) refers to subjects' choice migration towards both the low-end and high-end alternatives in a choice task, particularly when the assortment size of choice set is increased (Gourville and Soman 2007). The driver of extremeness seeking is usually considered to be preference uncertainty. For a non-alignable assortment, the potential regret caused by the between-attribute trade-offs (that force a person to forego some features to obtain others) is large and leads to an "all or nothing" strategy in the limit, specifically as the size of a non-alignable assortment grows (Gourville and Soman 2007).

All the above existing literature shows that extremeness effects have only been tested in single category choice settings. This limitation neglects two relevant facts: firstly, consumers must make multi-category decisions and inter-category comparisons in a variety of situations, such as multi-category choices on a shopping trip (Manchanda, Ansari, & Gupta, 1999; Jaehwan Kim, Allenby, & Rossi, 2002) or for major durable consumer good purchases (Hauser & Urban, 1986). Secondly, consumers use mental accounting rules by which purchases and decision making depend on a limited temporal consumer budget (Heath & Soll, 1996).

Too many options can create information overload and hence, deferral decision making (Pilli & Mazzon, 2016). Neumann, Roberts, and Morrison (2009) explored behavioral context effects, and their study shows that consumer decisions on a price-quality spectrum not only depend on the set of alternatives offered, but also on budget influences and multi-category comparisons that require the consumer to allocate money most efficiently and according to their taste. Compromise effect appears to be significantly stronger in multicategory choice situations. It is concluded that individuals have choice drivers based on their level of cognitive involvement (functional motivation), perception of product differentiation, quality consciousness, and demographic factors (including age and gender).

The theory of integrated losses also suggests that consumers would not perceive joint losses, as in a multicategory choice situation, as strongly as when the losses are valued separately, as in single category choice (Thaler, 1985). Moreover, Heath and Soll (1996) showed that budget setting alters consumer choice and leads people to overconsume certain goods and under consume others. Recently (Hsu, 2018) reports that consumer decision to purchase a product with an alignable attribute or non-alignable attribute depends on the type of the product. According to the structural alignment, "people place more weight on alignable (vs. non-alignable) attributes when evaluating competing options". Sun, Keh and Lee, (2019) proposes that consumers' regulatory orientation moderates alignable and non-alignable process. Regulatory focus theory (Higgins, 1997) refer to regulatory orientation. It suggests that people's attention, attitude, and goal pursuit activities are guided by their self-regulatory motivational orientation. Individuals with a promotion orientation are strategically inclined to focus on maximizing gains. They strive toward achieving hopes and aspirations and are sensitive to gains and nongains. In contrast, individuals with a prevention orientation are strategically inclined to focus on minimizing losses. They strive toward fulfilling duties and obligations and are sensitive to losses and non-losses (Crowe & Higgins, 1997). Regulatory focus theory has been shown to account for a wide range of judgments and decision-making (for a review see, Pham & Higgins, 2005).

Therefore (Sun, Keh, & Lee, 2018) identify the impact of regulatory orientation in alignable and non-alignable process. Their result indicates that prevention-oriented consumers who tend to construe information at a more concrete level rely more on alignable attributes when evaluating two options as compared to promotion-oriented consumers who tend to interpret data at a more abstract level, and are influenced more by non-alignable attributes. Also, Kusaka &

Takashima (2018) study focuses on how prior knowledge and the perceived importance of alignable and non-alignable attributes affect ordering through customization and searching from a retail assortment. They identify that Expert consumers observed alignable characteristic more important in customization and searching from a retail variety than a non-alignable attribute. In the same line (Nam, Wang, & Lee, 2012) study, participants considered non-alignable (vs. alignable,) attributes to be more differentiating between two competing brands, especially among experts. Also, compared to novices, experts more actively sought out non-alignable attributes, relied more on non-alignable than alignable characteristics when making brand choice decisions.

Decision-making is one of the elementary abilities of any individual, who have a bundle of factor which directly or indirectly influences the decision-making ability. Multiple factors related to the product, the decision-maker, and the decision-making environment could significantly influence consumer decision making. Additional factors are added in this dynamic, in an online scenario where a person deals with the intangibility of product and insecurity of decision results. As present work takes information processing approach, factors relating to the information processing, presentation of information, use of information or information processing style, and tendencies of the decision-maker are incorporated here. In this respect, the researcher needs to understand the individual difference. In previous decision-making, literature, individual variation such as demographic feature, personality traits, and cognitive skills are mostly explored.

2.2.3 Summary

The choice characteristic which includes alignable and non-alignable feature is one of the significant contributors in extreme effect in decision making and deferral decision making across choices in a set. The literature in alignable and non-alignable feature is quiet rich by now, and the application of this approach in consumer decision making could gain insight, which will be generalizable to other areas as well. Considering that the modern workposition itself in amidst of information processing complexity, Choice characteristic, and consumer decision making; the literature provides significant directions and conclusions. Few relevant and established directions are:

III. Directions

- The consumer decision is broadly categorized as extremeness seeking/aversion decision and deferral decision (Xie & Mattila, 2011)
- The role of alignable attributes in creating extremeness aversion (compromise effect) is significant. (Xie & Mattila, 2011).
- The role of non-alignable attributes in creating extremeness seeking is significant (Neumann, Roberts & Morrison, 2009; Xie & Mattila, 2011).

Gap

- Till now researchers have explained alignable and non-alignable attribute separately in compromise and extremeness seeking decision making. (Xie & Mattila, 2011). There is a possibility of mix study of alignable and non-alignable in compromise and extremeness seeking effect.
- Role of alignable and non-alignable attributes are never related to deferral decisions (Gourville & Soman, 2007) in studies.
- Information overload, a significant determinant of choice deferral, is only described using fix number of attribute and options (Pilli &Mazzo, 2015; Neumann, Roberts & Morrison, 2009; Xie& Mattila, 2011). The study of information overload in relation to alignability and non-alignability is needed.
- How alignability and/or non-alignability of option attributes influence these effects is not clear yet.

2.4 Individual Difference

Plato stated more than 2000 years ago that no two persons are born exactly alike; but each differs from the other in natural endowments, one being suited for one occupation and the other for another. The Psychological literature is full of findings of individual differences. The significant individual difference conclusions which buildup the supportive background of decision making (preference making, purchase decision, search behavior, etc.) are presented below.

Certain significant individual differences which can predict the way behaviors and reactions processed differently may include reasoning and memory (Benisz, 2014), intelligence, knowledge (Rolfhus & Ackerman, 1999), perception and personality (Rentfrow & Gosling, 2003; Zhao & Seibert, 2006). In addition to that (Diebels, Leary, & Chon, 2018) studied Individual differences in selfishness as a significant dimension of personality as a reinterpretation of the sixth personality factor. In this article, they provide a reinterpretation of the sixth factor as reflecting individual differences in selfishness (it reflects the behaviors of people who score low versus high on the trait). Also, Bediou and Scherer (2014) explained that differences in individuals' behavioral patterns, cognitions, and emotions resulted in the difference in individual preferences. Previously, Armstrong and Priola (2001) studied individual differences in cognitive styles. In this study, they provide insight that different individual possessed different cognitive style and its effects on task and social orientations of self-managed work teams. Shiloh, Salton, and Sharabi (2002) explored the individual difference in a perspective of rational and intuitive thinking styles. Their results showed that individuals have specific combinations of thinking styles, high logical/high intuitive and low rational/low intuitive, as predictors of heuristic response, and farming effect. (Newstead et al., 2004) examined individual differences in deductive reasoning as a function of intellectual ability and thinking style. Also, (Guastello, Shircel, Malon, Timm, & Guastello, 2015) study showed the individual differences in the experience of cognitive workload.

With advancement of technology the systematic individual differences in brain activities are also reported for episodic memory (Van Horn et al., 2008), long term memory (Tompson et al., 2019) and working memory (D'Esposito, Postle, & Rypma, 2000). It is established now that the significant individual differences exist in not only their physical features but also in this personality, cognition, and behavior (overall psyche)(Parasuraman & Jiang, 2012).

The factor of individual difference influence information search and decision making in the online scenario

The above background establishes that the individual difference includes an implicit and explicit characteristic of a human being. Implicit feature mean (personality and cognitive factor) or explicit consideration mean (demographic factor and environmental factor). Research has indicated that age, socioeconomic status (SES), and cognitive abilities influence decision making significantly (Bruine de Bruin, Parker, & Fischhoff, 2007; Finucane, Mertz, Slovic, & Schmidt, 2005). Internal factor refers to the individual characteristics (Lamb et al., 2015) such as age, economic situation lifestyle, and personality, which impact their buying decision. According to (San Martín & Herrero, 2012), psychological factor such as believe and attitude, motivation (Taloo,2007) and learning (Rani,2014) may play an essential role in individual decision making. For example, participants with extrovert personality type were found to retrieve information stored in their minds more quickly and to retain information better over short intervals, but not for longer intervals when compared with introverts (Eysenck, 1977). Individual categorized as being intolerant of ambiguity were found to prefer concrete stimuli and to perceive more information as being valuable (Dermer, 1973). An individual from different personality behaves differently toward risky decision making (Lauriola & Levin, 2001); they prefer to take a risk in the situation of loss and prefer to risk-averse in the case of gain.

Further scientist (Franken & Muris, 2005) found the indications that individual differences in sensitivity for reward predict behavioral decision-making, and that behavioral decision-making was not predicted by impulsive personality traits. Apart from these, there is some external factor which significantly influenced the personal decision such as social and cultural factor (Sata, 2013), the nature of products or service. Recently (Maia, Lunardi, Longaray, & Munhoz, 2018) study found that trust, perceived usefulness, and information quality are the factors that influence consumer most in participation in social commerce (a type of e-commerce).

According to (Zhang et al., 2013), online decision making is also highly influenced by internal and external factors. (Gong, Stump, & Maddox, 2013) report that time flexibility is an essential internal factor in online shopping. The factors which influence consumers to shop online are convenience, simplicity, and better price (Živilė & Gintarė, 2015). There is some other factor which influenced online shopping decision such as easy accessibility (Chocarro, Cortiñas, & Villanueva, 2013), review ratings, recommendation of another consumer on a product, service (Jiménez & Mendoza, 2013), and secure payment option (Wu et al., 2014). User experience with the e-trailer also influences the current purchase decision (Wu, 2013). The most beneficial factor of shopping online was identified as a possibility to compare prices and buy at a lower price. Cho and Chan (2018) investigate how participating in online review sites influence consumers' purchase decisions. They find that the source credibility and argument quality of a review, and the reader's perceived informational social influence and normative social influence have significant effect.

According to Klein et al. 1993, personality traits of individual plays, an essential role in the selection of information related to their decision task in their real-life situation. Dickman (1990) supported this claim, stating that personality traits drive the overall relationship between an individual and different information-processing for tasks. Wilson (1997), one of the forerunners of information behavior studies, judge's personality to be one of the most critical factors for understanding individual differences in search behavior. Kernan & Mojena (2006) state that people with an individual personality profile - willing to take risks, self-assured, dominant - are more efficient in using the information and accordingly, use information more than others. In addition (Harrison, 1999) results of multiple regression analysis showed demographic variability such as that the male gender, younger age, more experience with computers, an attitude of confidence regarding computers, lower math anxiety, and a creative cognitive style is associated with higher computer skill.

Early research showed either no significant age difference among online shoppers (Bellman et al., 1999; Li et al., 1999) or that online shoppers were older than traditional store shoppers (Donthu & Garcia, 1999; Korgaonkar & Wolin, 1999). However, their reasons to shop online significantly differ. Researcher report that men buy more often online because of the lower price. Respondents of the 25-35-year age group more often choose shopping online for such reasons as lack of time and a wide range of products.

Similarly variables like personality, individual cognitive ability contributes in the similar way. Marchionini and Shneiderman (1988) established the importance of an understanding of the cognitive process to be used as the critical link to one's information seeking. The method of information seeking is a cognitive activity that involves long-term and short-term memory, background knowledge, spatial cognition, and mental models. Individual with higher general intelligence has been observed to process information faster, select information more effectively, retain information better, make decisions faster (Taylor & Dunnette, 1974a) and organize information better in their minds (Hunt & Lansman, 1975). All these studies are pioneer in establishing the importance of individual difference in information search.

Most theories in the cognitive sciences (such as distributed cognition) were designed to provide a logical explanation of perception and knowledge distributed across subjects and to foster an

understanding of people's preferences in human-computer interactions. Recently (Hosam Al-Samarraie et al., 2018) studied the individuals' preferences as an important consideration of society and how different personality traits may contribute to those preferences. He reports elaborated on how different personality traits drive users' information-seeking behavior is important (Heinström, 2005, 2003, 2000).

Orchard (2014) studied individual differences as predictors of social networking by employees a 'Uses and Gratifications' framework to investigate whether personality, age, and sex predict motivations for using Social networking sites. This study explores both global and specific factors of personality using Eysenck's EPQ-R short form (extraversion, neuroticism, and psychoticism) and Beck's SAS (sociotropy and autonomy). The result suggested that individuals with different profiles vary in their motivations for using SNSs.

Previous results suggest that poor decision making on everyday laboratory tasks is related to real-world antecedents and consequences of poor decision making. (Appelt, Milch, Handgraaf, & Weber, 2011) introduced the decision-making individual differences inventory and guidelines for the study of individual differences in judgment and decision-making research. Recently Hüttermann, Memmert, & Nerb (2019) reported that individual differences in attentional capability are linked to creative decision making. This study scrutinized the link in a sport-specific divergent thinking task including videos of real game situations and compared performances between football players being divided into two different expertise levels (expert and amateur football players). Their result indicates that the attentional capability along the horizontal meridian of participants' attentional focus and participants' expertise level emerged as positive predictors of decision making.

The way information is searched and adopted may have a significant effect on decision-making. (Khanam, 2018) study identified several other factors which influencing online shopping such as convenience factors, psychological factors, promotional factors, technical factors, and motivational factors. Each element has some different variables. Convenience factors include less time, home delivery, and ease of transaction. Psychological factors include domain-specific innovativeness and the opinion of friends and peers. Promotional factors include online ads and social media exposure. Technical factors include user-friendliness of websites and display of product details. Motivational factors encompass utilitarian and hedonic values. The tendencies and cognitive styles of decision-maker may play a vital role in the decision-making process. Different dimensions of personality, cognitive complexity structures information processing styles determine the way an individual seeks, perceives, methods choose, and implement information.

It is widely the accepted fact that we still need to know a lot more about the process and result of decision making; starting from the decision-maker characteristics (personality, cognitive style, biases, and attitudes), situational characteristics (time pressure, insufficient information, stakes, risks and competition), decision options (tangible/intangible, value, demand, features and availability/affordability) to the interaction of all of these. Previous literature has studied a few of these tendencies in decision-making scenario; however, in the present study, the variable which is theoretically directly associated with information processing are considered.

2.4.1 Psychological tendency

According to (San Martín & Herrero, 2012), psychological factor such as belief and attitude, motivation (Taloo, 2007) and learning (Rani, 2014) play an essential role in individual decision making. According to (Amichai-Hamburger, Wainapel, & Fox, 2002), personality is a leading factor in understanding why people behave the way they do on the Internet. Since the net, by its very nature, is powered by human interaction, it follows that we cannot understand the workings of the Internet without understanding the personalities of those who surf it (see also, Amichai-Hamburger, 2005).

a) **Uncertainty Avoidance**

Uncertainty is an ever-present feature of everyday life. Some uncertain situations can be distressing – “Will I get the job?” – while others are more tolerable – “Will there be traffic on the way to work?” In addition to varying across situations, the extent to which uncertainty is distressing varies across individuals. According to (Dugas et al., 2007) intolerance of uncertainty (IU) is a personality trait that reflects negatively beliefs about change and that have recently been defined as “an individual's dispositional incapacity to endure the aversive response triggered by the perceived absence of the salient, key, or sufficient information, and sustained by the associated perception of uncertainty” (Carleton, 2016a).

Uncertainty refers to epistemic cases involving incomplete or unknown information. It applies to predictions of future events, to physical measurements that are already made, or to the unknown. Uncertainty arises in partially observable and stochastic environments, as well as due to ignorance, indolence, or both. Lipshitz and Strauss (1996) characterize uncertainty as ‘a sense of doubt that blocks or delays action.’ McCloskey, (1996) lists four sources of uncertainty: missing information; unreliable information; ambiguous or conflicting information; and complex information.

I. **Current Studies on Uncertainty Avoidance**

The studies on uncertainty avoidance tendency are common in numbers of the field including insurance, philosophy, physics, statistics, economics, finance, sociology, ecology, information science, and psychology. (Tanovic, Gee, & Joormann, 2018) correlated neural and psychophysiology of the perception of uncertainty as threatening as an intolerance of uncertainty. Intolerance of uncertainty (IU) reflects the attitude of uncertainty as threatening, regardless of the true probability of a threat. IU is elevated in various forms of psychopathology, uniquely associated with anxiety and depression symptoms after controlling for related constructs, and prospectively predicts symptoms. Therefore, significant attention is devoted to recommendations for future research, including consideration of the complex interplay of IU with emotion regulation, cognitive control, and reward processing.

The study of uncertainty in decision-making is receiving greater attention in the fields of cognitive and computational neuroscience. Several lines of evidence are beginning to elucidate different variants of uncertainty. Particularly, risk, ambiguity, and expected and unexpected forms of uncertainty are well articulated in the literature.

Intolerance of Uncertainty (IU) is a dispositional characteristic resulting from negative beliefs about uncertainty and its implications (Dugas & Robichaud, 2007), the core of which it appears to be fear of the unknown (Carleton, 2012), wherein the possibility of an adverse event occurring is considered threatening irrespective of the probability of its occurrence (Carleton, Sharpe, & Asmundson, 2007).

Current theories (Carleton, 2012) and models, e.g., (Dugas, Buhr, & Ladouceur, 2004; Einstein, 2014; Grupe & Nitschke, 2013) of IU implicate a potentially significant transdiagnostic role for uncertainty in decision making for clinical and non-clinical populations. However, there is relatively limited research explicitly assessing behavioral correlates of IU. Also (Carleton, 2012) says understanding the relationship between IU as a cognitive construct and behavior appears to be an essential aspect of demonstrating the broad utility. Similarly, Rosen and colleagues (Rosen et al., 2010) found a positive association between self-reported trait IU (measured as a total score) and behaviors associated with the reduction of uncertainty. Further (Carleton et al., 2016) study results suggest that increasing IU is associated with increasingly risk-averse behaviours; in addition, decision making under uncertainty has been (and continues to be) a key topic of inquiry in the behavioral sciences, especially biology, economics, and psychology, and has inspired a vast literature of thousands of studies (reviewed in Plous, 1993; see for recent examples, Pleskac, Diederich, & Wallsten, 2015; Starcke & Brand, 2012).

In summary, intolerance of uncertainty may be defined as a cognitive bias that affects how a person perceives, interprets, and responds to uncertain situations on a cognitive, emotional, and behavioral level. Specifically, intolerance of uncertainty manifests itself by an excessive tendency to find uncertain situations stressful and upsetting, to believe that unexpected events are negative and should be avoided, and to think that being uncertain about the future is unfair. Furthermore, intolerance of uncertainty leads to the inability to act when faced with an uncertain situation. Research has shown that intolerance of uncertainty and worry are highly related. Furthermore, a laboratory study showed that the manipulation of intolerance of uncertainty leads to changes in worry, with increased intolerance of uncertainty leading to more worry and decreased intolerance of uncertainty leading to less worry (Ladouceur, Gosselin, & Dugas, 2000)

b) Impulsivity

Barratt & Patton, (1983) view impulsiveness as a complex construct which is reflected in one of the more popular definitions of impulsiveness as a “predisposition toward rapid, unplanned reactions to internal or external stimuli without regard to the negative on sequences of these reactions to the impulsive individuals or to others” (Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). Similarly, Dickman (1993) identified “Impulsivity as a tendency to act with less forethought than do most individuals of equal ability and knowledge.”

According to (Beatty & Elizabeth Ferrell, 1998) consumers have an impulse buying tendency as a personality trait: buying impulsiveness as a consumer’s tendency or propensity is related to sudden emotional urges to make on-the-spot purchases based on instantly perceived values. Studies conducted by Koufaris (2002) have conceptualized online impulsivity as unplanned purchase behavior. In addition, Parboteeah et al. (2009) explain impulsivity as an uncontrollable urge to buy. In general, a researcher looked at impulsivity as a state of mind and created by shopping environment (Rook, 1987) or as a unique personality factor which is innate to the individual (Rook and Fisher, 1995). Therefore, by definition Impulsiveness has been defined as both “the tendencies (1) to experience spontaneous and sudden urges to make on-the-spot purchases and (2) to act on these felt urges with little deliberation or evaluation of consequence” (Beatty and Ferrell, 1998).

In a traditional retail context, for example, individuals who rated higher on the impulsiveness scale have been found to be more likely to experience urges to buy impulsively and to act on these urges (Beatty and Ferrell, 1998). In an online context, impulsiveness has also been found to positively influence the intention to shop online (Zhang et al., 2006). Earlier in the context of online, Rook and Fisher (1995) also suggest that online impulsivity also can be conceptualized as an unreflective decision process. In this same line or reference to online impulsivity, researchers of consumer behavior have approached the concept of impulsivity from three different views. Stern (1962) provides the behavior view of impulsivity, define impulsivity when consumers make unplanned purchases, or make inferior choices (Koufaris 2002).

Further, in addition, behavior view researcher (Kahneman 2003, Pham 2007, Slovic et al. 2007) hypothesizes impulsivity as behavior which deviates from the rational ones should be considered as irrational or impulsive. Extension of the second view, Rook (1987) explained impulsivity from the psychological point of view that when consumers feel the urge to buy. This idea suggests that impulsivity is not always an unplanned purchase. For example, consumers may use store products as cues to recall other intended purchases (Rook 1987). The third view suggests (Payne et al. 1993, Pieters & Wedel 2007) impulsivity as a process, which is based on the assumption that consumers are problem-solvers who search for information before making their buying decision. This view focuses on the analysis and interpretation of detailed information search patterns and holds that patterns can be identified as deliberate or impulsive with a quantitative index (Bettman & Jacoby 1976, Payne 1976).

Some researcher (Zhang et al., 2006; Huang & Kuo, 2012; Wells et al., 2011) examined impulsivity as a trait in some studies. In Hertzog and Nesselroade, (1987) study “traits represent the feature of individuals that remain relatively stable across situations and can be used to distinguish between two individuals, for example, some individuals may be inherently shy regardless of the context of the social situation.” In the context of impulse buying, several researchers have studied the effect of impulsiveness on consumers’ tendencies to buy impulsively, in both offline (e.g., Beatty and Ferrell, 1998) and online (e.g., Zhang et al., 2006; Zhang et al., 2007) shopping domains. Moreover, individuals who frequently involve in impulse purchases often share common personality traits and characteristics (Youn and Faber, 2000). For instance, age is an individual characteristic that has been found to influence impulse buying, whereby younger people tend to be more impulsive than older people (Bellenger et al., 1978).

I. Current studies on impulsivity

Impulsivity is defined as an unplanned response to internal or external stimuli, without prior forethought and a disregard for potential negative consequences (Bari & Robbins, 2013). Cross, Copping, and Campbell, (2011), Dretsch and Tipples, (2011) reported the gender-wise individual difference in impulsivity. According to (Dretsch & Tipples, 2011) study, compared to females, male have high impulsive sensation, learn more quickly to make consistent selections from the advantageous decks despite the significant immediate losses. In the same direction (Steinberg et al., 2008) examined age differences in impulsivity in a socioeconomically and ethnically diverse sample. Their result report that age differences in impulsivity, which are unrelated to puberty, follow a linear pattern, with impulsivity declining steadily from age ten on. (Ottaviani & Vandone, 2011) report revealed the influence of individual impulsivity in making debt decisions. That mean Impulsivity predicted unsecured debt (i.e., consumer credit), but it was not significantly associated with secured debt (i.e., mortgages). Finally, they concluded that Individual decision-making is also influenced by impulsivity. Before that (Zermatten, Van Der Linden, D’Acromont, Jermann, & Bechara, 2005) studied the impulsivity and decision-making processes on the Iowa Gambling Task. They suggest that premeditation is related to decision making influenced by somatic (or emotional) markers. Along the same line, Frijda (2010) explored how emotions are causal determinants of action in term of impulsivity. It argues that emotional events, as appraised by the individual, elicit changes in motive states (called states of action readiness), which in turn may (or may not) cause action. Actions can be elicited automatically, without prior intention (called impulsive actions), or intentionally.

With the advent of the internet and e-commerce, researchers have been interested in whether impulsivity is evident in this new shopping environment. According to (Donthu & Garcia, 1999) online shoppers tend to be impulsive buyers. Besides this reference to online impulsivity, researchers of consumer behavior have approached the concept of impulsivity from three different views: 1) behavioral impulsivity (Stern.,1962), 2) psychological impulsivity (Rook, 1987), and 3) process impulsivity (Pieters & Wedel, 2007). The early studies suggested that (Petty & Cacioppo, 1979; Celsi & Olson, 1988) involvement in online information search activity decreases their level of impulsivity. In study of (Y. F. Huang & Kuo, 2012a) an engagement reported that online information does not restrain impulsivity. They also report importance of mood-elicited in the impulsivity of purchases in e-commerce. The recent researches try to look impulsivity with different angle and concept so that they use new methods to understand impulsivity, for example, using a process-tracing method such as eye-tracking, often we know that retailer and marketer has used the cue to engage the consumer in impulse buying. In this line (Cao, Su, Liu, & Gao, 2007) studied the relationship between internet addiction and impulsivity. They aimed to assess whether internet addiction is related to impulsivity among Chinese adolescents. Result identify that the internet addiction group had significantly higher scores on the BIS-11 subscales of the attentional key, motor key, and total scores than the control group. Also, the internet addiction group scored higher than the control group on the failure to

inhibit responses of Go-Stop Impulsivity Paradigm. In addition (Parboteeah, Valacich, & Wells, 2009) study reported that website design could influence perceived enjoyment, which in turn promotes the impulsiveness.

Similarly, Ding & Lin (2012) study found that flash banners and music could make website users more likely to adopt impulsive information search patterns. Further, Pearce & Coughlan, (2012) examined the relation between impulsivity tendency of the consumer with a different aspect of a product like hedonic and utilitarian. Their result suggests that consumers with a high degree of buying impulsiveness are more likely motivated by perceived hedonic value (adventure, social, and personal pleasure as subsets of hedonic value that affect hedonic motivation), then the utilitarian value (cost saving, convenience, product variety, and information availability).

Earlie, Creyer et al. (1990) had shown that people who restrain their effort during decision-making might fail to conduct a comprehensive evaluation of attributes across different alternatives. Finally, researchers started to conceptualize online impulsivity and empirically tested it in the business-to-consumer (B2C) shopping environment (LaRose 2001; Koski, 2004; Madhavaram & Laverie, 2004). In addition to the above Madhavaram and Laverie (2004) study focused on role of emotion and impulsivity arise. Their study report that in an online situation, the consumer might be more willingness to shop online when they were feeling good. These studies indicate that similar to offline consumers; online consumers often deviate from rational buying behavior when experiencing high emotions (LaRose, 2001; Madhavaram & Laverie, 2004; C.-S. Wu & Cheng, 2011). In the same direction (Y. F. Huang & Kuo, 2012b) report a study on how impulsivity affects consumer decision-making in e-commerce. Their results suggest the importance of mood-elicited impulsivity of purchases in e-commerce.

While earlier studies mainly focused on the advantage of online shopping web sites in product storage and delivery (e.g., Zhang et al., 2006). According to (S. H. Lim, Lee, & Kim, 2017) they highlighted potential problems of reverse logistics from the viewpoint of e-commerce companies and consumers. This study shows that impulsive buying could adversely influence e-businesses.

In summary, impulsivity mean unplanned decision, this term indicated that individual decision is influenced by impulsivity, and there is many endogenous and exogenous factor which influence the impulsivity. Many studies report that internet addiction influence impulsivity, also website design, and music may influence impulsive behaviour. Also, previous literature reports that impulsivity motivates hedonic value adventure, social, and personal pleasure.

2.4.2 Cognitive tendency

Marchionini & Shneiderman (1988) had addressed the importance of an understanding of the cognitive process in order to be used as the key link to one's information seeking. The process of information seeking is a cognitive activity that involves long-term and short-term memory, background knowledge, spatial cognition, and mental models. Individual with higher general intelligence has been observed to process information faster, select information more effectively, retain information better, make decisions faster (Taylor & Dunnette, 1974b) and to better organize information in their minds (Hunt & Lansman, 1975). Therefore, current work selected need for closure and exploratory tendency as the two critical cognitive tendencies influencing decision making through information processing.

a) The Need for closure

Need for closure is a dimension of individual differences which is related to persons' motivation for information processing to reach their final judgment and decision. Kruglanski (2004) defined the need for cognitive closure (NFC) as the "individuals desire for a firm answer

to a question, any firm answer, as opposed to confusion and/or ambiguity.” He describes NFC in two ways one is urgency, and another is permanence. Urgency refers to one who makes a decision quickly without consider any additional information. They feel discomfort when they interact with ambiguity and confusion. Permanence refers to one who decides based on experience. NFC constitutes a core motivational construct for information processing in decision making and has attracted extensive research interest over the past few decades (for overviews see: Kruglanski, 2004; Kruglanski, Dechesne, Orehek, & Pierro, 2009; Roets, Kruglanski, Kossowska, Pierro, & Hong, 2015).

Some of the recent lines of studies includes establishing the relationship between information processing, information use and need for closure (Vermeir, Van Kenhove, & Hendrickx, 2002, Vermeir & Van Kenhove, 2005, Choi, Koo, Choi, & Auh, 2008, Kossowska & Bar-Tal, 2013); the dimension of environmental, individual and need for closure (Hiel & Mervielde, 2003; Chirumbolo, Livi, Mannetti, Pierro, & Kruglanski, 2004; Vermeir & Geuens, 2004; DeBacker & Crowson, 2006; DeBacker & Crowson, 2008; Wichary, Kossowska, Orzechowski, Ślifierz, & Marković, 2008) and the level of cognitive engagement (DeBacker & Crowson, 2006).

I. Current studies on the need for closure

As we know, personality traits and personal values have been integrated conceptually (Olver & Mooradian, 2003). Individuals “react to their environments by evolving patterns of thoughts, feelings, and behaviors” -i.e., characteristic adaptations- “that is consistent with their personality traits” (McCrae & Costa Jr, 1999). McCrae and Costa (1999) suggest cataloging the characteristic adaptations or values that are associated with personality traits and explain how they reflect common basic tendencies. Several authors have already attempted to explain how these values relate to enduring individual trends and found, for example, relationships between the five-factor model and benefits (e.g., Olver & Mooradian, 2003; Dollinger, Leong, & Ulicni, 1996). (Disatnik & Steinhart, 2015) investigated NFC with personality dimensions such as risk aversion, uncertainty changes, and their effects on investment decisions. They recognized the condition in which consumer, despite having new information about changes in market uncertainty, are less likely to assimilate the new information and consequently do not make investment decisions that are in line with their risk-aversion levels. Their study results report that that high rather than low need for cognitive closure can lead to a lack of openness to new information and therefore may dilute consumers’ tendency to update their investment portfolios in a way that reflects their risk preferences. Also, the authors address possible ways to influence consumers’ assimilation of new information, to help even those with a high need for cognitive closure make investment decisions that are in line with their levels of risk aversion.

In line with personality and personal value studies (Vermeir & Geuens, 2004) studied the gender-wise NFC as a tendency and social self-esteem (e.g., esteem derived from the approval of others) of youngsters. Their result suggests that the youngsters’ values and self-images concerning social self-esteem differ according to their level of NFC and their gender. More specifically, High NFC youngsters find it more important to be appreciated, are more appearance minded, feel more pressure to achieve, are more achievement-oriented and are more eager to relax than low NFC. On the other hand, low (versus high) NFC youngsters are more social, individualistic and have more own opinions. High (versus low) NFC youngsters also consider themselves more hard-working and modest. Their result also suggests that high NFC men and women have a similar social mentality, while low NFC men are more social than low NFC women. Moreover, high NFC men are more achievement-oriented and have more own opinions (than high NFC women, while no differences exist for low NFC men and women (achievement orientation, own opinions).

Lay epistemic theory is one of the most famous theoretical frameworks describing the knowledge formation process. According to it, the central variable determining the epistemic process is the need for cognitive closure. (Strojny, Kossowska, & Strojny, 2017) explored the circumstances when the need for closure motivates complex cognition. (DeBacker & Crowson, 2006; DeBacker, Crowson, Beesley, Thoma, & Hestevold, 2008) conducted a study on student group in the classroom environment. These studies attempted to understand the motive of cognitive engagement and goal achievement with the help of epistemological beliefs and need for closure epistemological reasons. They found the strong relationship between cognitive engagement, epistemological beliefs, and need for closure. (Harlow, DeBacker, & Crowson, 2011) examined need for closure, achievement goals, and cognitive engagement in High School students. Findings suggested that the two facets of classroom and need for closure are relatively independent of each other and that high levels of preference for certainty are more likely to be problematic for learners than high levels of choice for structure. Furthermore, the relationship between classroom need for closure and cognitive engagement is partially mediated by mastery goals.

Researcher (Vermeir, Van Kenhove, & Hendrickx, 2002, Vermeir & Van Kenhove, 2005, Choi, Koo, Choi, & Auh, 2008, Kossowska & Bar-Tal, 2013) found the significant differences between high and low NFC participants in relation to the amount of information sought, the amount of information used, the use of decision rules and the level of confidence in their decisions made (Vermeir et al., 2002). Similarly, Hiel & Mervielde, (2003) conduct the two experimental studies which support the negative relationship between heightened levels of need for closure and cognitive complexity. (Neuberg, Judice, & West, 1997; Neuberg, West, Judice, & Thompson, 1997) have drawn the causal inferences that when the participant faced with a complicated situation with a time-constrained than they spontaneously select a simple solution. Additionally (Chirumbolo et al., 2004) studied the need for closure in the creative discussion, and they found that the percentage of creative acts during group discussion was reduced for the individual with a high demand for closure (i.e., under time pressure) in comparison to low percentage need for closure participant.

Moreover, it was confirmed that time pressure mediates the negative relationship between the need for closure and group creativity or complicated situation. Recently (Jaško, Czernatowicz-Kukuczka, Kossowska, & Czarna, 2015) study identified that decision task characteristic moderated the relationship between NFC and decision making. When a task did not offer a certain decision rule, high NFC participants prolonged the information search more than low NFC individuals. However, when a reliable strategy was suggested, high NFC participants behaved in line with it. These results are discussed within an uncertainty management framework. Along the same line of research (Wichary et al., 2008) explored individual differences in indecisiveness through pre-decisional information search and decision strategy use. Their results showed that "participants high in decisiveness dimension, compared to 'low decisive,' spent less time and acquired less information before making decisions, especially in the first trials of the choice task." 'High decisive' also had a greater tendency to use a simple lexicographic heuristic than 'low decisions.' In a recent study (Kossowska & Bar-Tal, 2013) examined the relationship between NFC and heuristic information processing. They found the positive relationship between NFC and heuristic information processing when participants assessed themselves as being able to use cognitive strategies consistent with their level of NFC (high ability to achieve closure). Their data show that motivation-cognition interactions influence the information-processing style.

The results support the view that high decisiveness is associated with a greater tendency to simplify the decision process. (Choi et al., 2008) suggested that one's need for cognitive closure affected the one's style of information search (attribute-based search vs. alternative-based search). An individual who has a high score on NFC prefer to search for information based on

the attribute, not alternatives and consider of a smaller amount of information to make a final choice than low NFC score individual.

Lee, (2011) examined the Decision-Making Uncertainty (DMU), need for cognitive closure, and supply chain performance (SCP). This study adds to the literature the use of DMU in connection with NFC. Findings reveal that high NFC purchasing decision-makers (vs. low NFC) that are motivated to reduce discomfort associated with DMU are also motivated to close on a decision. Individuals with high NFC significantly correlated to increase overall SCP. However, knowledgeable and experienced high NFC purchasing managers consistently make better purchasing decisions (high SCP) for their firms than less experienced high NFC purchasing managers. The less experienced high NFC purchasing managers may need the training to utilize supplier performance better facts and data to develop confident decisions, reduce decision errors and biases, and improve their work performance. By reducing supply disruption risk through managing NFC pitfalls, this study expects to buy firms to enhance their performance.

Apart from the above NFC has been related to a wide variety of human behaviors- from group behavior (e.g., Pierro, Mannetti, De Grada, Livi, & Kruglanski, 2003) to consumer behavior (e.g., Vermeir, Van Kenhove, & Hendrickx, 2002). Some researchers report that NFC is not only related to behavior but more basic individual beliefs. For example, research showed that NFC influences traditionalism in beliefs about politics (Kossowska & Hiel, 2003) and ethics (Van Kenhove, Vermeir, & Verniers, 2001). Recently (Pilli & Mazzon, 2016) identified that choice deferral is a result of information overload and dimension of Need for closure. They also reported that high score on NFC is consistent with the best option in a choice task, the pattern among consumers with a low score on NFC is consistent with regret anticipation, resulting from the objective of negative emotion minimization during decision making.

In summary, it is clear that in most cases, high levels of this motivation are associated with simplified and accelerated processing of information. This can lead to an overly simplified understanding of this variable. There are reasons to believe that the typical relationship is reversed under certain circumstances.

b) The Exploratory Tendency

Psychologist Berlyne (1960, 1963, 1971) was the first scholar who provides an extensive theory of exploration. According to him, "exploration behavior as essential animal behavior, motivated by curiosity, which serves the purpose of maintaining an optimal arousal level." He associates exploration as a motivation and behavior tendency. In term of motivation (Berlyne, 1960) introduced two different forms of exploration one is which is directed towards an external goal (e.g., finding food), is called extrinsic exploration and another one who is motivated by an interest in stimuli for their own sake is called intrinsic exploration. In term of behavior, (Berlyne, 1963) distinguishes between diverse exploration, which is directed towards a range of stimuli, and specific exploration. In contrast to Berlyne (1963), Bloch, Sherrell, & Ridgway, (1986) described exploration in their ongoing search as a recreation; exploration is conceptualized as a situational phenomenon rather than a personal tendency.

In consumer behavior context, exploratory behavior tendencies have been explained and measured by the amount of change or variety in what a person buys and consume (Goukens et al., 2007; Ratner et al., 1999). The concept of Exploratory Behavior in consumer behavior was introduced in early 1980's by Raju to choose behavior aimed at modifying environmental stimulation (Raju, 1980; Puthankrissi Sankaranarayan Raju & Venkatesan, 1980) The concept was originated in the psychology field with studies of individual's internal need for stimulation. When the stimulation from the environment or actual stimulation is less than the optimum stimulation level, the individual will try to increase stimulation and vice versa. Psychological pleasantness is highest at the level of stimulation where the person feels most comfortable, i.e., Optimum Stimulation Level (OSL) (Steenkamp & Baumgartner, 1992) and

such behavior that strives to change the general environmental stimulation towards OSL has been named as “exploratory behavior.” Berlyne (1960), Raju (1980), Steenkamp and Baumgartner (1996) study provided strong evidence that people do have an inherent need to maintain an optimum level of internal stimulation.

Consumers’ personality characteristics are essential constructs influencing the applicability of exploratory behaviors and that of consumer behavior. Innovative purchase behavior in product purchase, seeking variety in product, switching brands and exploring, recreational shopping, and information search are some of the parameters of exploratory tendencies in the consumer buying process (Baumgartner & Steenkamp 1996). Thus, exploration has been the previous step to purchase. The most useful characteristic of the internet is that it supports the pre-purchase stage (Maignan & Lukas, 1997) as it helps customers compare different options (Dickson, 2000).

I. Current studies on the exploratory tendency

According to (Goukens et al., 2007; Ratner et al., 1999; McAlister & Pessemier, 1982) exploratory behaviour tendencies have been explained and measured by the amount of change or variety in what a person buys and consumes. In the field of consumption, purchasing new goods, using new services, and visiting new stores are typical manifestations of an exploratory tendency (Grande, 2005). According to (Soares et al., 2008), consumers who have a higher exploratory tendency (ET), seeks more multiplicity in their information exploring activities and buying decisions.

Individuals with higher OSL are more likely to exhibit greater awareness and a greater tendency to evaluate, try, and adopt new products or new information. They also show the monotony avoidance, need for cognition, impulsivity, curiosity, and intolerance of ambiguity and lower on rigidity and dogmatism than lower OSL (Baumgartner & M. Steenkamp, 1994; Raju, 1980; Steenkamp & Baumgartner, 1995). They also identify that OSL is different for each person and is correlated with specific personality characteristics like tolerance for ambiguity, rigidity, and dogmatism. Again, in addition to that, Raju (1980), report that rigidity and dogmatism have a negative correlation with OSL while tolerance for ambiguity has a positive effect.

Orth & Bourrain, (2005) determined that the pleasantness of a scent moderated effects of optimum and actual stimulation on risk-taking, variety seeking, and curiosity-motivated behavior. Downstream effects extended onto the importance of label color, text, and grape variety in the preference development process. Jain & Pant, (2012), in their study, found that generation Y has the tendency to keep on exploring and switching brands and is low in brand loyalty level. (Guido, Capestro, & Pino, 2010) conducted a study on Italian and Greek consumers; their result suggests that both the categories of respondents prefer moderate risk, are inclined to exploration through shopping, and tend to choose new brands. Italian consumers, however, show higher interpersonal communication skills than the Greek ones.

Michaut (2009) found the association between exploratory behavior and product newness, in a cross-national context, culturally different individuals. (Chowdhury, Ratneshwar, & Desai, 2009) study proved that the customers with high ET have more significant hedonic search behavior and therefore consider various products even when searching for products for others. High ET customers leads to varied choice in purchases in case of promotion focus. Also, high and low ET of customer-led to less varied sets of choices in case of prevention focus. Respondents with high Exploratory Buying Behavior Tendencies (EBBT) choose a greater number of less priced items in contrast to low EBBT respondents. Dastidar & Datta (2009) concluded in their study that relatively younger consumers are higher in interpersonal communication (IC) subset of an exploratory tendency than middle and older age groups. Also, males are higher on the subset of exploratory tendency risk-taking (RT), innovativeness (INOV) than their female counterparts. Also, income and education do not make a significant difference

in the subset of the exploratory tendency brand switching (BS), risk-taking (RT), innovativeness (INOV), interpersonal communication (IC), exploratory through shopping (ETS), and information seeking (IS).

According to (Singh, 2015) the personality factor such as self-concept and impulsiveness is positively related to exploratory behavior, whereas ethnocentrism is negatively associated with it. Mor & Sapra (2015) examined exploratory tendencies in the Indian context. They found that model fitted successfully in Indian scenario for mobiles and brand switching came out as the most crucial factor of exploratory tendencies followed by exploration through shopping and interpersonal communication. Along the same line, Chakraborty & Balakrishnan, (2017) successfully established the pattern of exploratory tendencies across three generations (X, Y, and baby boomer). The study also reveals that the various sub-dimensions concerning exploratory tendencies, may have a significant difference among the generations. Specifically, consumers from gen X exhibit high repetitive behavior proneness, exploration through shopping, information seeking, whereas, baby boomers are high on risks taking interpersonal communication. As gen X seeks more information, they do depend most on third-party articles/blogs/reviews to research vendors, and baby boomers depend most on tradeshows. Gen Y and baby boomers are very likely to buy products which match their values and beliefs. In (Moon, 2014) study on generation Y exclusively, the result found in comparison to other generation that generation Y is different in terms of their creativity and innovation ability.

Similarly, (Der Hovanesian, 1999; Yarrow & O'Donnell, 2009) reported that Gen Y consumer consciously seeks information about products. (Dastidar, 2016) shed light on consumers varying proneness to different types of deals depending on the type of exploratory tendency that they needed to satisfy and the kind of good that was on sale. Recently (Yeboah, Adjei, & Owusu-Prempeh, 2018) found a weak association between new product physical attributes and consumer variety-seeking in the mobile phone category. Again, findings show that product typography, product color, product texture, and product shape, and consumer variety-seeking reveal weak association.

Successful marketing requires continuous and rigorous identification of those consumers groups that are comparatively open-minded towards new or relaunched products and services, and this is where exploratory behavior tendencies among the buyers are essential in the context of marketing.

2.4.3 Summary

According to (Zmud, 1979), individual variation is defined as the combination of demographical variable, psychological feature, and cognitive feature. These factors can be studied and used in the understanding of the immense source of variance in human, and naturally, these factors influence the decision making- the process of the decision-maker in their natural environment.

Considering that the present work position itself in amidst of information processing complexity choice characteristic, individual factor, and consumer decision making; the literature provides significant directions and conclusions. Few relevant and established directions are:

IV. Directions

- Need for closure studied in relation to information overload and deferral decision making (Pilli & Mazzon. 2016).
- Exploratory behavior studied across generation in online shopping (Chakraborty & Balakrishnan, 2017).

- Big five personality dimensions in decision making are studied extensively. (Franken & Muris 2005; Bruin & Parker, 2007; Filiz & Battaglio Jr, 2015)

V. **Criticism:** Majority of literature with a focus of individual differences in decision making studies have used:

- Small student sample to test these dimensions (Xie & Mattila, 2011).
- Follow Survey method mostly (Neumann, Roberts & Morrison, 2009; Xie & Mattila, 2011).
- Mostly take verbal reports only (Neumann, Roberts & Morrison, 2009; Xie & Mattila, 2011).
- Alternatively, Use simplified experiment task (Neumann, Roberts & Morrison, 2009; Xie & Mattila, 2011).
- Examined broader concept of personality and cognitive complexity.

Gap

- There is a need to explore the specific personality and cognitive factors in decision making, specifically extreme and deferral decision making.
- There is a need for methodologically sound study and drawing conclusions from triangulation.