Chapter 4: Research Methodology and Research Design

The preceding chapters reviewed the literature on how firms have been deriving competitive advantages with changing times. World has now evolved into a digital economy and has become one global market with the advent of Internet. This has changed the way businesses and consumers transact. In this information-driven economy, literature establishes that analytics tools are increasingly being adopted by online retailers and large enterprises to derive competitive advantage. This chapter builds upon the research objectives stated in the earlier chapters and describes the research methodology. The below figure 4.1 schematically presents the structure of this chapter.

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<td>The research philosophies and paradigms are discussed</td>
<td>Mixed method as the choice of methodology is discussed and justified</td>
<td>Various phases and timelines are presented</td>
<td>Profiles of the 85 survey companies are presented</td>
<td>Profiles of the 3 case companies are presented</td>
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Figure 4.1: Outline of the chapter- Research Methodology and Research Design

Section 4.1 of this chapter elaborates the philosophical underpinnings of the research. The section focusses strongly on two opposing schools of thought namely- positivism and interpretivism, illustrating some of the key epistemological and ontological considerations that are important in a research.

The chapter goes on (section 4.2) to discuss methodological choice for this thesis. This section starts by providing an overview of mixed method research and the rationale for selecting mixed method for this study. Further, the research design section (4.3), explains the approach adopted which was implemented using mixed methods by using the techniques of
4.1 Philosophical assumptions and methodology

4.1.1 Research Philosophies and Paradigms

The philosophy supporting any kind of research is closely knit with the concepts of ontology, epistemology and axiology. The philosophies are closely related to the fundamentals of paradigm with paradigmatic preferences of the researcher that helps the researcher arrive at methodological choice.

This section starts with presenting the theories of ontology and epistemology school of thoughts, with the nature of paradigms and takes it further to discuss paradigmatic preferences to ontological, epistemological and other assumptions made by the author.

Finally, this section concludes by connecting these preferences to the body of SCM and competitive advantage theories that has been developed over the years –which are the focus areas of the literature review in Chapter 2. The paradigmatic preferences and philosophical stand of the author is presented next that helps author answer the research questions set out in Chapter 3.
Ontology and Epistemology

Ontology can be defined as “the branch of metaphysics concerned with the nature of being”, as per Oxford English dictionary. According to Saunders et al. (2009, p. 110) “ontology is concerned with the nature of reality”. Easterby-Smith et al. (2008, p. 60) take this definition further and state “philosophical assumptions about the nature of reality”. As per Bryman and Bell (2011, p. 19) “questions of ontology are concerned with the nature of social entities”.

Epistemology as defined by Oxford English dictionary states “the branch of philosophy that deals with knowledge, especially about its methods, validity, and scope”. Collis and Hussey (2009, p. 59) define epistemology from a research perspective that is concerned with the core question: “what do we accept as valid knowledge?” As per Easterby-Smith et al. (2008, p. 60) epistemology can be defined as “general sets of assumptions about the best ways of inquiring into the nature of the world”.

As noted earlier, the ontological and epistemological assumptions and stances of researchers have a major impact on the way in which research is carried out. In relation to SCM research this is articulated effectively by New (2009, p. 89): Although both academic literature and practitioner discourse are happy to bandy the term ‘supply chain’ around, the implicit imagery behind the metaphor – materials flowing through the economy via some neat system of imaginary pipes – is intrinsically problematic. The difficulties arise because of questions of ontology (for example, what do we mean by ‘product’?) and epistemology (how can we know?).

The following sections discuss paradigms in particular the positivist and interpretivist positions, with specific reference to their ontological and epistemological assumptions.

Paradigms

The emphasis on the concept of a paradigm in research philosophy in recent decades is usually attributed to the work of Thomas Kuhn in the 1960s. Kuhn (1962) discussed paradigms in the context of “the progress of scientific discoveries in practice” and went on to define paradigms as “universally recognised scientific achievements that for a time provide model problems and solutions to a community of practitioners” (p. viii).

Bryman (1988) provides a useful definition of a paradigm: “a cluster of beliefs and dictates which for scientists in a particular discipline influence what should be studied, how research should be done and how results should be interpreted” (p. 4). Gummesson (2000, p. 18) suggests that the concept can be used to represent “people’s value judgements, norms,
standards, frames of reference, perspectives, ideologies, myths, theories, and approved procedures that govern their thinking and action”.

Perhaps of more interest and consequence in the context of the current research is the impact of the “world-view” represented by the paradigmatic preference of a researcher on the conduct of research in the social sciences generally and in business research specifically. The work of Burrell and Morgan (1979) is central to this discussion. In their text *Sociological Paradigms and Organisational Analysis*, they applied the notion of a paradigm to the social sciences and described four distinct paradigms (see figure 4.2).

![Figure 4.2: Four Paradigms of Social Theory](image)

The vertical axis in the above classification makes the assumptions about the nature of society and the horizontal axis makes assumptions about the nature of social science. From the perspective of research in business and management, the researchers are more interested in the horizontal axis that helps them position themselves along the subjective objective continuum. While the continuum is important to recognize, the debates and discussions between followers to the extreme ends of the spectrum has its own concerns with the relative merits of objectivist (positivist) and subjectivist (interpretivist) positions.

In the view of Tashakkori and Teddlie (1998), it is more suitable for the researcher in a study to consider and think of the adopted philosophy as a continuum rather than opposite positions. Morgan and Smircich (1980, p. 492) take this ahead and come up with a six-stage continuum between “pure” positivism and “pure” interpretivism. Although it is useful to understand the characteristics of the purist positions to illustrate the different types of world-
views represented by each. These notions of ontology and epistemology are inherent in these world-views.

**Philosophies of research: positivism, interpretivism and pragmatism**

Let us first understand the different research paradigms, before we decide on the methodological choices and issues, as it is important to get an overview of philosophical perspectives as they help shape the way researches conduct research and impact the data collection process, analysis of data and interpretation of results.

A paradigm can be defined as a world-view core to the process of research in all areas (Saunders et al. 2009). It is primarily a set of basic beliefs that defines the nature of the world and the place that and individual holds in the world and it also guides individual’s action (Guba and Lincoln 1994; Denzin and Lincoln 2000).

Research methods are grounded in philosophical traditions in a discipline that stem from the prevailing paradigm, defined as a “basic set of beliefs that guides action” (Guba, 1990, p. 17). The philosophical paradigm of the researcher heavily influences the methods chosen to address research questions (Frankel et al., 2005). Kuhn’s (1962) influential book, “The Structure of Scientific Revolutions”, ignited the paradigm wars of the late twentieth century in the social and behavioural sciences.

One of the main issues of empirical scientific research is concerned with the appropriate choice of research strategies as the key to further knowledge creation. As such, the use of research methodologies is controversially debated among scholars, also affecting the research in supply chain management (Creswell, 2013, Frankel et al., 2005, Mentzer and Kahn, 1995, Meredith et al., 1989). As ontological as well as epistemological considerations play a vital role in this discussion, the presentation of research strategies is outlined based on these grounds.

According to Frankel *et al.* (2005) the individuals’ world view, the ontological position, sometimes referred to as Weltanschauung (Checkland, 1993), determines the starting point of every research endeavour. Two extreme ontological views can be differentiated from a philosophy perspective: The objectivist view portrays the understanding that “social phenomena and their meaning have an existence that is independent of social actors” (Bryman and Bell, 2011, p. 19).

Following the antithetical constructionist position, the “social phenomena and their meanings are continually being accomplished by social actors” (Bryman and Bell, 2011, p.
20). This implies that social actors are the drivers behind social phenomena. Social reality can thus not be regarded as being definite as it is subject to constant change, triggered by individual’s influence on the environment.

Following extant theory (Bryman and Bell, 2011) the ontological framework inevitably influences the cohesive selection of research strategies, ultimately governing the author’s decisions in regard to the choice of the epistemological paradigm. Thus, from an epistemological perspective, the debate about research strategies is influenced by two distinctive scientific paradigms, namely positivism and interpretivism (Bryman and Bell, 2011, Burgess et al., 2006). Scholars who adapt the positivist view aim to imitate the natural sciences (Bryman and Bell, 2011), driven by the point of view that reality can be understood (Bhaskar, 2008). Accordingly, as seen by Mentzer and Kahn (1995), positivist researchers pursue the “goal to explain and predict reality, where reality is considered to be objective, tangible, and fragmentable” (p. 232). The opposing interpretive view helps to “understand a phenomenon but not to explain or predict” as it depicts a “collective of multiple socially constructed realities [where] people [are] proactive and voluntaristic” (Mentzer and Kahn, 1995, p. 232). In a logistics and SCM research context it has been found that the scholars’ research focus gradually shifted from mainly following the positivist paradigm (Mentzer and Kahn, 1995) towards a more balanced use of the interpretivist and positivist paradigms (Golicic et al., 2005). This research study belongs primarily to the field of competitive advantage and supply chain management, in which there has been two commonly used research paradigms or philosophies, namely positivism and interpretivism (Hussey and Hussey, 1997; Collis and Hussey, 2009). The below table 4.1 shows the alleged differences between the two paradigms.

**Table 4.1: Positivism vs. Interpretivism**

<table>
<thead>
<tr>
<th>Metatheoretical assumptions</th>
<th>Question</th>
<th>Positivism</th>
<th>Interpretivism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontology</td>
<td>What is the nature of reality?</td>
<td>Person (researcher) and reality are separate.</td>
<td>Person (researcher) and reality are inseparable (life-world).</td>
</tr>
<tr>
<td>Epistemology</td>
<td>What is the relationship between the researcher and the researched?</td>
<td>Objective reality exists beyond the human mind.</td>
<td>Knowledge of the world is intentionally constrained through a person’s lived experience.</td>
</tr>
<tr>
<td>Research object</td>
<td>Is research object independent or dependent?</td>
<td>Research object has inherent qualities that exist independently of the researcher.</td>
<td>Research object is interpreted in light of meaning structure of person’s (researcher’s) lived experience.</td>
</tr>
<tr>
<td>Method</td>
<td>What is the process of the research?</td>
<td>Inductive process (causes and effect) Statistics, content analysis.</td>
<td>Inductive process (hermeneutics, phenomenology)</td>
</tr>
<tr>
<td>Theory of truth</td>
<td>Singular or multiple?</td>
<td>Correspondence theory of truth: one-to-one mapping between research statements and reality.</td>
<td>Truth as intentional fulfillment interpretations of research object match lived experience of object.</td>
</tr>
<tr>
<td>Reliability</td>
<td>Is it reliable?</td>
<td>Replicability: research results can be reproduced.</td>
<td>Interpretive awareness: researchers recognize and address implications of their subjectivity.</td>
</tr>
</tbody>
</table>
Positivism necessitates an ontology that the reality and researcher are separate and the reality is made up of atomistic, discrete and observable events, whereas interpretivism requires that researcher and reality are inseparable and reality is internal & socially constructed (Weber 2004). The interpretative paradigm is viewed as qualitative, inductive and subjectivist, while the positivist paradigm is described as quantitative, deductive and objectivist (Burrell and Morgan 1979; Hussey and Hussey 1997; Denzin and Lincoln 2000; Gummesson 2000). Positivism and interpretivism are often known as the opposing ontological and epistemological perspectives of research (Weber 2004).

**Positivism**

Positivism, goes back to its origins in the philosophy known as realism. This was developed by theorists that included Auguste Comte (1798-1857), John Stuart Mill (1806-1873) and Emile Durkheim (1859-1917). It is positioned at the objective end of the paradigmatic continuum shown in figure 4.2 (above).

Positivism originates from the term “positive” that means progressive which indicates positive and progressive development of the field of social sciences. Taking the ontological stand, it is believed by positivists that there is one social reality this is external to the researcher. On the other hand, epistemological stand maintains an objective and independent attitude as they believe the only observable and measurable phenomena can be validly regarded as knowledge (Collis and Hussey, 2009). Therefore, positivists, are inclined to place a great emphasis on the use of quantitative methods to deductively test hypotheses in an objective manner.

The primary characteristic that positivism portrays is to solve key practical problems and determine through statistical analysis any existence of causal relationships (Kim 2003). Per Hussey and Hussey (1997), real world related phenomenon or knowledge should be viewed objectively independent, externally and singularly. Positivists assert that with the ontological assumption, scientific investigation and deductive reasoning will both converge upon objective truths (Plack, 2005). Blaikie (1993) states, on taking epistemology assumptions, positivists assert that knowledge is an outcome of sensory experiences as result of experimental or comparative analysis.

Positivism places a large emphasis on scientific objectivity (Dupuis, 1999). As per Dupuis (1999), to obtain objective and accurate data, there is a need to separate subject from
object, and anything attached personally to the researcher such as selves, personal experiences and emotions should be removed. The use of objective measures, quantitative data and methods in the social world for theory testing is emphasized. Nevertheless, this method also has faced criticism by researchers as it also comes with many potential pitfalls associated in its adoption of this position related to human issues. The pitfalls in the positivist approach led to the emergence of interpretivism, subjectivism etc. The new set of paradigms is referred by multiple names, such as, interpretivism, phenomenology and subjectivism (Gummesson 2000).

Positivism has played a great influencer in the progress and development of research traditions in the areas of natural and social sciences (Plack 2005). Positivism research belongs to the category of social sciences that aims to gain insights from the social dimensions and management behaviour using data driven decision making. In social science research, it is commonly applied to generate more accurate, measurable and objective data (Burrell and Morgan, 1979).

**Interpretivism**

To challenge traditional positivist paradigmatic position, the interpretivist paradigm was developed in the social sciences. It is positioned at the subjective end of the paradigmatic continuum as shown in figure 4.2 (above).

The origin of interpretivism dates to the intellectual traditions of hermeneutics and phenomenology (Kim 2003). As per Bryman and Burgess (1999), interpretivism can be defined as a strategy of social research that helps interpret social phenomena in terms of meanings. Thereby, the whole emphasis is on the social actors’ own language, experiences and perceptions and not on the measurement and prediction of phenomena, but (Lee, 1991).

However, in the most recent edition (Collis and Hussey, 2009) they use the word interpretivism to “suggest a broader philosophical perspective” (p. 57). For similar reasons, the word interpretivism is used in this context throughout this thesis.

In ontological terms, interpretivists believe that social reality is subjective because it is socially constructed. For this reason, the phrase “social constructionism” is often used to describe this paradigmatic position – the world is an emergent social process. Thus, there are multiple realities as each person has his or her own sense of reality (Collis and Hussey, 2009, p. 59). Knowledge in an interpretivist’s epistemology is a resultant outcome from everyday experiences, concepts and meanings (Blaikie 1993). Interpretivists aim to understand what and how about any phenomenon. Research states that in social science research, important and
context specific factors, and personal experiences and emotions of researcher, that are often not considered and easily ignored, must be taken into consideration, in keeping with inter-subjectively created meanings of the social world (Lee 1991; Dupuis 1999; Kim 2003). In effect, interpretivists, have placed a strong emphasis on the usage of qualitative methods to reason and build theory in a subjective way. Here, the whole emphasis is on the development and overall understanding of phenomena, rather than deriving possible causal relationships between various measures.

Therefore, to explore the social world and obtain qualitative data, researchers have preferred qualitative methods and theory building/generation over theory verification. There has always been opposing thoughts on the positivist approach and the interpretive approach, as the positivists claim that approaches of natural science are only regarded as scientific ones, on the contrary interpretivists claim that the research of organizations, institutions and people demands methods that are overall different likes of natural science (Lee 1991).

**A New Paradigm war on Positionality**

At the either end of the paradigm continuum, there is either “Pure” positivism and “pure” interpretivism that are regarded as extreme positions. There has been a widespread debate over the years of giving relative merits for each position and the extent of impact of each positionality on the research process (Herr and Anderson, 2005).

Robson (2002) refers to this debate as “so-called ‘paradigm wars’ endemic” (p. 43). Mangan et al. (2004) note that “the various paradigmatic positions are now often discussed in terms of an antithesis between two schools of philosophy” (p. 566). Similar points are made by several authors, notably Gummesson (2000) and Hussey and Hussey (1997). The forthright views of Byrne (1998) in relation to the positivist position in social sciences research is revealing: “Positivism is dead. By now it has gone off and is beginning to smell.” (Byrne, 1998, p.37).

However, the distinguishing characteristics of each position is worth considering in consideration with ontological, epistemological and other possible and relevant issues. These characteristics are shown in table 4.2 below, which is compiled from various sources (Easterby-Smith et al. (2008), Saunders et al. (2009), Bryman and Bell (2011), Robson (2002), Denzin and Lincoln (2000), Collis and Hussey (2009).
Table 4.2: Characteristics of Positivism and Interpretivism

<table>
<thead>
<tr>
<th></th>
<th>Positivism</th>
<th>Interpretivism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontology</td>
<td>Objective</td>
<td>Subjective</td>
</tr>
<tr>
<td>Epistemology</td>
<td>Independence</td>
<td>Emancipation</td>
</tr>
<tr>
<td>Axiology</td>
<td>Value-free</td>
<td>Value-laden</td>
</tr>
<tr>
<td>Rhetoric</td>
<td>Formal style of writing</td>
<td>Informal style of writing</td>
</tr>
<tr>
<td>Causal</td>
<td>Causal</td>
<td>General understanding</td>
</tr>
<tr>
<td>Deductive</td>
<td>Deductive</td>
<td>Inductive</td>
</tr>
<tr>
<td>Theory/hypothesis testing</td>
<td></td>
<td>Theory building</td>
</tr>
<tr>
<td>Reductionist</td>
<td>Reductionist</td>
<td>Holistic</td>
</tr>
<tr>
<td>Operationalisation</td>
<td></td>
<td>Stakeholder perspectives incorporation</td>
</tr>
<tr>
<td>Generalisation</td>
<td>Generalisation</td>
<td>Theoretical abstraction</td>
</tr>
<tr>
<td>Large samples</td>
<td>Sample size</td>
<td>Small samples</td>
</tr>
<tr>
<td>Experimental</td>
<td>Experimental</td>
<td>Interpretation</td>
</tr>
<tr>
<td>Artificial</td>
<td>Artificial location</td>
<td>Natural location</td>
</tr>
<tr>
<td>High reliability</td>
<td>High reliability</td>
<td>Low reliability</td>
</tr>
<tr>
<td>Low validity</td>
<td>Low validity</td>
<td>High validity</td>
</tr>
</tbody>
</table>

Sources: (Easterby-Smith et al. (2008), Saunders et al. (2009), Bryman and Bell (2011), Robson (2002), Denzin and Lincoln (2000), Collis and Hussey (2009))

When discussing ontological assumptions, the position of positivist is objectivist in that reality is observed separately from the researcher. On the contrary, the interpretivist position is viewed subjectively by the researcher. It is positioned at the left-hand end of the matrix of Burrell and Morgan (1979) as shown in figure 4.2. In terms of epistemological assumptions, the position of a positivist is characterized by independence. Thereby, the researcher is independent of what is being researched. On the contrary, the interpretivist position assumption identifies the inter-relationship and interaction between researcher and the researched. To elaborate further, the researcher (observer) is a part of what is being researched (observed).

Quantitative researchers most often work from the positivist paradigm or the post positivist paradigm. Research conducted from positivism is expected to be objective, free of values, hypothesis driven, and measurable. Positivists use deductive reasoning and seek to find causes that precede, or occur at the same time as, effects. The post positivist paradigm has replaced positivism (Schwandt, 1997) or follows positivism as “the (current) predominant philosophy for (quantitative) research in the human sciences” (Teddlie and Tashakkori, 2009, p.69). Research consistent with post positivism is influenced by researchers ‘values and their chosen theory or conceptual framework’. According to the post positivist paradigm, facts cannot necessarily prove a theory and determine a cause. Reality is socially constructed, and internal and external validity are both important.
Qualitative researchers work mostly from the constructivist (or interpretivist) paradigm, which supports the notion that there are many realities that are constructed as the research engages with participants. Realities are constructed by participants and researchers who seek to understand participants ‘points of view’. Observations of reality are influenced by researcher’s values. Multiple realities exist, and our understanding of these realities is constructed individually and socially. Constructivists believe that determining a connection between cause and effect is impossible; therefore, description of reality is important. Qualitative researchers engage in inductive reasoning as they work from units of data toward a theory, or as they work from the specific or particular to the general. Statements about reality are limited to the time and context of the study, so generalizability is limited to transferability of results from one context to another (Teddlie and Tashakkori, 2009)

Philosophical differences between positivist/post positivist and constructivist paradigms contributed to tension, or “paradigm wars” (Teddlie and Tashakkori, 1998, p.3), between qualitative and quantitative researchers. “Qualitative researchers stress the socially constructed nature of reality, the intimate relationship between the researcher and… emphasize the value-laden nature of inquiry… [Qualitative researchers note that] quantitative studies emphasize the measurement and analysis of causal relationships between variables, not process…within a value-free framework.” (Denzin and Lincoln, 2005, p.10)

Mixed methods researchers accept the idea of compatibility between qualitative and quantitative methods taking the pragmatist point of view (Howe, 1998). The researchers instead of requiring to choose between qualitative or quantitative methods focus on determining how both qualitative and quantitative methods will help answer the research questions. Both inductive and deductive reasoning logic are used, and if required hypotheses may be proposed as well.

For pragmatists, internal validity and credibility play an important role. When it comes to generalization of findings, pragmatists place a lot of emphasis on external validity and credibility, in combination taking into consideration that hypotheses belong to time and context (Teddlie and Tashakkori, 2009)

Towards a Multi-Paradigmatic Position?

On the relative merits of two “pure” positions, according to Bryman and Bell (2011), “The point being made here is that quantitative and qualitative research represent different research strategies and that each carries with it striking differences in terms of the role of theory,
epistemological issues and ontological concerns. However, the distinction is not a hard-and-fast one: studies that have the broad characteristics of one may have a characteristic of the other” (p. 26). Similarly, as per Guba and Lincoln (1994, p.105) “both qualitative and quantitative methods may be used appropriately with any research paradigm” and as per Easterby-Smith et al. (2008) “research problems (in management) often require eclectic designs which draw on more than one tradition” (p. 56).

Conceivably Bryman (1988) points out that in practice there is a greater reconciliation between researchers of two schools and this is particularly true in the applied areas. SCM and Competitive Advantage areas could be regarded as such an “applied areas” and there is enough evidence that this “rapprochement” is found favourable by many scholars in this field.

As per research, positivism belongs to the branch of philosophy known as realism

1

Robson (2002) came up with an approach to “real-world” known as critical realism. Per him “realism permits a new integration of what are usually referred to as subjectivist and objectivist approaches” (p. 35). Robson argues that the real-world research needs to retain the advantages of positivism by ensuring that a “scientific attitude”. Therefore, in this context a “scientific attitude” requires that research execution involves systematic, sceptic and ethical approaches.

**Pragmatism**

As per Creswell (2009), pragmatism does not bind itself to either of the above-mentioned philosophies and views of reality. Pragmatists are of the view that pragmatism is neither false under interpretivist nor positivist philosophies. Per pragmatists, it is absolutely possible for a researcher to work with both philosophies (Creswell 2009; Saunders et al. 2009). Further, pragmatists claim that mixed methods, that includes both qualitative and quantitative methods, are possible and highly suitable within one research to provide more comprehensive evidence and strength than doing research with one method (Blaikie, 2009). The compatibility thesis has also been argued from the viewpoint of paradigm relativism, which has been called “pragmatic relativism” or “pragmatism” (Howe, 1988; Tashakkori and Teddlie, 1998). Many mixed methods scholars argue for some version of pragmatism as the philosophical foundation for mixed methods research. Pragmatists adopt “whatever philosophical and/or methodological approach works for the particular research problem under study” (Tashakkori and Teddlie, 1998, p. 5). The basic belief of the pragmatic paradigm is that the research problem dictates

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1 Many labels exist, including scientific realism, critical realism, fallibilistic realism, subtle realism and transcendental realism.
the research method. Hence, pragmatism rejects the incompatibility thesis and claims that research paradigms may either remain separate or be combined in new research approaches.

As stated by several authors, the researcher’s philosophical stance is totally dependent upon the nature and objectives of the research. As per Saunders et al., (200), it is important to arrive at clearly defined research objectives before getting into research methodology, as the background of research objectives will determine the precise research methodology to be followed. Therefore, to address the research objectives and questions as stated in Chapter 3 the researcher needed to collect both qualitative data (that involves more depth and insightful exploration with limited number of interviewees) and quantitative data (that can be collected from broader samples to generalize). This goes to show that the researcher follows pragmatism and therefore the philosophy of pragmatism fortifies the researcher’s choice of mixed methods in this research. As explained earlier in Chapter 1 (introduction) and Chapter 2 (literature review), there has been little research on comparison between traditional and Internet based businesses in the way they use information and analytics for competitive advantage. This research aims to understand this phenomenon and achieve this by answering the following questions.

**Research Question 1:** What is the extent of use of analytics as a source of competitive advantage by online intermediaries from theory?

**Research Question 2:** What is the extent of use of analytics as a source of competitive advantage by traditional businesses in the following areas?

- **Research Question 2.1:** What is the extent of use of descriptive analytics by means of data visualization techniques by traditional businesses in the following areas?
  - Interactive visual analysis of customer purchasing
  - Interactive visual analysis of product sales and profitability by various channels

- **Research Question 2.2:** Do traditional businesses use predictive analytics in the following areas of competitive advantage?
  - Customer segmentation for targeted marketing and discounts using Clustering Techniques;
  - Dynamic Pricing;
  - Association Rules recommendations, cross-selling and up-selling;
  - Use Forecasting Models to predict superstar products and profitable customers;
  - Compute Customer Lifetime Value (CLV),
The above-mentioned research questions demand the use of research methods and tools that are likely to yield useful data, both qualitative and quantitative, to achieve the set research objectives. This demands employing a suitable research design that comprises of several methodological considerations including research philosophies, research method and research design.
4.2 The Methodological Choice in this Thesis

4.2.1 Mixed Method research as a Methodology

The Definition

This study uses the definition provided by Creswell and Plano (2007); that mixed methods research focuses on the collection, analysis and mixing of both quantitative and qualitative data in a single study or a series of studies (Molina-Azorin, 2009). Mixed method research dates as far back as 1959, when Campbell and Fisk used multimethod to study the validity of psychological traits and encouraged others to use it to examine multiple approaches to data collection. It was born out of the belief that all methods have limitations and the view that biases from any single method could neutralize or cancel the biases of other methods which further herald triangulation of data sources as a means of convergence, connection or embedded to the integration of quantitative and qualitative data. This has led writers worldwide to develop procedures for mixed strategies that take numerous forms (Creswell, 2004). Mixed method research recognizes that both quantitative and qualitative research methods are useful and important and does not seek to replace either but rather draw from the strengths of each, to minimize the weaknesses of both in single research studies and across mixed studies. Other proponents of mixed methods research include works of Brewer and Hunter (1989); Newman and Benz (1998) and Reichardt and Rallis (1994), in (Johnson and Onwuegbuzie, 2004).

A mixed-method research design was adopted in this research to investigate if traditional businesses use analytics- descriptive and predictive to gain competitive advantage, as their counterparts in web-based businesses and online intermediaries do.

Mixed methods research is further defined as the type of research in which a researcher, or a team of researchers, integrates qualitative and quantitative research approaches within a single study or a set of closely related studies (Creswell and Plano Clark, 2007; Johnson et al., 2007). The roots of mixed methods research design can be traced to the introduction of the multitrait-multimethod (MTMM) matrix, which was developed to assure that observed variance is attributable to the trait under study, rather than the method (Campbell and Fiske, 1959). Subsequently, the term “triangulation” was introduced to describe investigations that combine multiple data sources and multiple methods (Denzin, 1978). Jick (1979) further explicates the concept of triangulation by describing “within-method triangulation” (i.e. multiple quantitative or multiple qualitative methods) and “across-methods triangulation” (i.e. combining qualitative and quantitative methods).
Qualitative data tends to be open-ended without pre-determined responses while quantitative data usually includes closed-ended responses such as found on questionnaires or psychological instruments. Qualitative research is related with the using of words to provide a descriptive meaning and understanding of experiences and situations of individuals which are part of the phenomena being investigated (Denzin and Lincoln, 2000). Quantitative research focuses on numerical data which can provide an overview of relationships, patterns and trends (Zikmund, 2003). The next section discusses in detail the advantage of using a mixed-method research design which is that it enhances the examination of multiple arrays of data that can impart added rigor, breadth and depth to the research (Saule, 2002) and why mixed methods research, as a methodology, is appropriate for the current study.

Ultimately, the possibility of mixing methods can be very large because of the many potential classification dimensions, as it opens an exciting and almost unlimited potential for future research (Johnson and Onwuegbuzie, 2004). Mixed method research strategies or designs can be developed from either a mixed-model (mixing qualitative and quantitative approaches within or across the stages of the research process) or mixed-method (including a quantitative phase and a qualitative phase in an overall research study). Johnson and Onwuegbuzie, (2004) provided a detailed list of across and within mixed-method designs and the different kinds of mixed-methods designs based on Morse (1991). However, researchers should consider two primary decisions; firstly, whether to operate within one dominant paradigm or whether to conduct the phases concurrently, sequentially (Johnson and Onwuegbuzie, 2004) or transformatively (Creswell, 2004).

Secondly, in a mixed methods design, the findings must be mixed or integrated at some point. Nonetheless, one can easily create more user specific and more complex designs. For example, quantitative-qualitative-quantitative stages or both a mixed-model and mixed methods approach. Furthermore, a design may emerge during a study in new ways, depending on the conditions and information that is obtained. The most important point is for the researcher to create designs that effectively answer their research questions. This view contrasts with the approach where one completely follows either a quantitative or qualitative paradigm (Johnson and Onwuegbuzie, 2004).

Mixed methods research (Johnson et al., 2007: 123) is: “the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration”. This research methodology is argued to be intellectual and practical, as it is
likely to take the advantage of overcoming the weaknesses in singular methods (Johnson and Onwuegbuzie, 2004), and to provide the most informative, complete, balanced, and useful research results (Johnson et al., 2007).

![Diagram of Weaknesses and Strengths of Qualitative and Quantitative Research](Figure 4.3: Mixed Methods Research)  
(Source: Johnson and Onwuegbuzie (2004))

As explained by Tashakkori and Teddlie (1998), there has been growing interest in research methodologies such as mixed-method and mixed-model studies in many fields. Nevertheless, there has been a lack of conceptual clarity and not enough examples of the mixed-methods being used (Tashakkori & Teddlie, 1998). As described by Tashakkori and Teddlie (1998), a few authors (for example Creswell, 1994; Miller & Crabtree, 1994; Morse, 1991) have attempted to develop taxonomies of mixed-methods. Tashakkori and Teddlie (1998) describe mixed-methods as a combination of qualitative approaches (the constructivists/phenomenological) and quantitative approaches (the positivists and post-positivists) in the methodology of a study (such as in the data collection stage). Tashakkori and Teddlie (1998) mentioned mixed-model studies as the combination of these two approaches across all phases of the research process (such as conceptualisation, data collection, data analysis, and inference). However, they stated that, although the growth of the mixed-method or mixed-model has been retarded by the vestiges of the paradigm wars, researchers are now free to use the methods in their research questions. In fact, the research questions are best
answered with mixed-method or mixed-model research designs, rather than with a sole reliance on either the quantitative or the qualitative approaches.

A multi-methodological approach to study systems development (Ovaska, 2009); analysing the use of information systems in logistic industry (Pokharel, 2009); and applied multi-case research in a mixed-method research project (Jansen, 2009) were conducted in the field of Information Systems.

4.2.2 Mixed Method used in this study

“By combining multiple observers, theories, methods, and empirical materials, researchers can hope to overcome the weakness or intrinsic biases and the problems that come from single-method, single-observer, and single-theory studies. Often the purpose of triangulation in specific contexts is to obtain confirmation of findings through convergence of different perspectives. The point at which the perspectives converge is seen to represent reality.” (Jakob, Alexander, 2001).

Figure 4.4: Mixed Method used in this Research
(Source: Author)

This study adopts the mixed method approach- triangulation design to answer the research questions as shown in the figure 4.3 above. The most common and well-known approach to mixing methods is the Triangulation Design (Creswell, Plano Clark, et al., 2003). The purpose of this design is “to obtain different but complementary data on the same topic” (Morse, 1991, p. 122) to best understand the research problem. The intent in using this design is to bring together the differing strengths and non-overlapping weaknesses of quantitative methods (large sample size, trends, generalization) with those of qualitative methods (small N, details, in depth) (Patton, 1990). This design and its purpose of converging different methods has been discussed extensively in the literature (e.g., Jick, 1979; Brewer & Hunter, 1989; Greene et al.,
This design is used when a researcher wants to directly compare quantitative statistical results with qualitative findings or to validate or expand quantitative results with qualitative data.

**Triangulation Design Procedures.** The Triangulation Design is a one-phase design in which researchers implement the quantitative and qualitative methods during the same timeframe and with equal weight (see Figure 4.5). The single-phase timing of this design is the reason it has also been referred to as the “concurrent triangulation design” (Creswell, Plano Clark, et al., 2003). It generally involves the concurrent, but separate, collection and analysis of quantitative and qualitative data so that the researcher may best understand the research problem. The researcher attempts to merge the two data sets, typically by bringing the separate results together in the interpretation or by transforming data to facilitate integrating the two data types during the analysis. Jenkins’ (2001) single-phase study of rural adolescent perceptions of alcohol and other drug resistance is an example of a Triangulation Design. She collected and analyzed quantitative and qualitative data and merged the two data sets into one overall interpretation, in which she related the quantitative results to the qualitative findings.

**Variants of the Triangulation Design**

The four variants are the convergence model, the data transformation model, the validating quantitative data model, and the multilevel model. The first two models differ in terms of how the researcher attempts to merge the two data types (either during interpretation or during analysis), the third model is used to enhance findings from a survey, and the fourth is used to investigate different levels of analysis.

The fourth variant is the Triangulation Design is what Tashakkori and Teddlie (1998) referred to as “multilevel research” (p. 48). In a multilevel model, different methods (quantitative and qualitative) are used to address different levels within a system. The findings from each level are merged together into one overall interpretation. For example, Elliott and Williams (2002) studied an employee counselling service using qualitative data at the client level, qualitative data at the counsellor level, qualitative data with the directors, and quantitative data for the organizational level.
Figure 4.5: Four Variants of Triangulation Design
Source: Creswell (2006)

Strengths of the Triangulation Design.

‘Triangulation' comes with several important opportunities for researchers. Firstly, it allows researchers to be more self-assured of their results. This can help play more positive role such as, it can excite formation of innovative methods and newer ways of defining problems that strikes a balance with predictable data-collection methods. This may also help uncover the unknown dimensions to a phenomenon. By its comprehensiveness, this can also serve as the critical test for opposing theories. ‘Triangulation' helps reduce the deficiencies of single-source research. Two methods (qualitative and quantitative) complement and verify one another, which reduces the influence of any inherent bias.
This design has several strengths and advantages, including the following:

- The design makes intuitive sense. Researchers new to mixed methods often choose this design. It was the design first discussed in the literature (Jick, 1979), and it has become a framework for thinking about mixed methods research.
- It is an efficient design, in which both types of data are collected during one phase of the research at roughly the same time.
- Each type of data can be collected and analysed separately and independently, using the techniques traditionally associated with each data type. This lends itself to team research, in which the team can include individuals with both quantitative and qualitative expertise.

**An Assessment of Challenges of 'Triangulation'**

The 'triangulation' strategy comes with its own drawbacks. It starts with the premise that if the research is not clearly focused theoretically or practically, it will not deliver a satisfactory outcome. There are arguments that each method should be represented separately in a significant way.

To address the challenges in combining the two paradigms in the same study, Morse (1991) suggests likely two ways in which both quantitative and qualitative methods can be triangulated. Firstly, a qualitative method used as initial investigation in a quantitative study; in which, qualitative methods are regarded as an add-on method. Secondly, quantitative methods go before as preliminary investigation in a qualitative study in the sense that quantitative methods are regarded as supplementary methods. In principle, wherever a researcher uses both qualitative and quantitative methods in the same research project, it is assumed in advance that the researcher has clarity of the main ontological and epistemological position of the phenomenon that is being investigated (Denzin and Lincoln, 1994). As mentioned earlier in this thesis, both methods in qualitative and quantitative come with their own strengths and weaknesses, therefore research recommends focusing on the within-method and between-method type of 'triangulation'. Hence, a combination of the two approaches have been encouraged to gain from two paradigms and thereby curtailing the drawbacks of each.

In summary, ‘triangulation’ is possible and a good way to reap the benefits of both qualitative and quantitative methods. This can cut across the qualitative and quantitative divide. The use of 'triangulation', however, will depend on the researcher's philosophical position. It is not aimed merely at validation but at deepening and widening one's understanding. It tends to
support interdisciplinary research rather than restricted within social sciences. In fine, 'triangulation' can, indeed, increase credibility of scientific knowledge by improving both internal consistency and generalizability through combining both quantitative and qualitative methods in the same study. However, effective 'triangulation' depends on coordination and collaboration; particularly those who are actively involved in collecting data and response.

4.2.3 Rationale for selecting Mixed Method for this research

There are two major types of research methods that are quantitative and qualitative. Qualitative research is in alignment with the positivist paradigm, whereas qualitative research is in close alignment with the naturalistic paradigm (see table 4.3). In the context of quantitative research, there exists a more formal, objective and deductive approach to solving a problem. Whereas, in qualitative research the approach to problem solving is more informal, subjective and inductive. The characteristics of both approaches are presented in the table below:
Table 4.3: Comparison of positivist and naturalistic paradigms (Quantitative and Quantitative approaches)

<table>
<thead>
<tr>
<th>Positivist paradigm</th>
<th>Naturalistic paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a single reality that can be measured.</td>
<td>There are multiple realities that can be studied only holistically and cannot be predicted or controlled although some level of understanding can be achieved.</td>
</tr>
<tr>
<td>The researcher and the research participant can remain independent of one another and not influence one another.</td>
<td>The researcher and the research participant cannot remain separate or independent. They interact and influence one another.</td>
</tr>
<tr>
<td>Findings of research can be generalized from the study sample to the larger target population.</td>
<td>Findings cannot be generalized beyond the study sample. Knowledge gleaned from the study is in the form of “working hypotheses.”</td>
</tr>
<tr>
<td>Cause and effect relationships can be tested.</td>
<td>Cause and effect relationships cannot be tested since there are multiple realities that are continually changing, so it is impossible to distinguish causes from effects.</td>
</tr>
<tr>
<td>Research can be conducted objectively and value free.</td>
<td>Research is subjective and value bound (i.e., the researcher’s own values).</td>
</tr>
</tbody>
</table>

Source: Keele (2011)

Although quantitative research is viewed as the more rigorous of the two (qualitative and quantitative) in the past, qualitative research has ended up gaining more credibility in the world of science in the recent times. Both the methods are considered suitable for research such that each method contribute significantly to the scientific body of knowledge. Choice of the right method depends basically on the research questions(s) inquired. These questions stem from the research objective and purpose/problem statement.

Factor- isolating questions ask, “What is this?” These questions name and describe factors or variables of interest to the researcher. “What is the extent of use of analytics in your organization to serve your customers better?” would be included in this category of questions. The most appropriate research design to answer these questions would be descriptive. Descriptive studies are designed to gain more information about characteristics of a topic of interest. Descriptive level research is most appropriate when very little research is available on the top. A case study design further helps in-depth understanding of a phenomenon through detailed information.

The advantage to descriptive level research is that the researcher can collect a large amount of data, however, even though there is breadth of data, it tends to lack depth for the sample. On
the other hand, case study research provides depth and richness of data, but lacks breadth since it is limited to one person or event. Hence, this study employs a triangulation of both the methods to answer the research questions effectively.

**4.3 Research Design**

A research design characterizes a plan and the procedures for conducting an investigation based on the nature of the research problem and issues that are being addressed in combination with the researcher’s personal experience (Creswell 2009).

![Figure 4.6: The Research ‘Onion’](source: Saunders et al., 2009)

The research methodology helps the readers understand the process followed by the researcher in choosing the appropriate method to conduct the research. It echoes the overall process that constitutes the research philosophy, research approach, research strategy, data collection methods and data analysis and ensure that they are consistent (Saunders et al. 2009). The “Onion” approach proposed by Saunders et al. (2009), depicted in the above figure 4.6, was used as a guiding principle behind the research design.

**4.3.1 The Research Approach Adopted for this study**
In the context of Mixed Methods research approach in SCM, Gammelgaard and Larson, (2001) conclude that the method of mixing a survey and case study permitted them to apply quantitative measures as well as probe more deeply into the context to develop a richer understanding of the phenomenon.

![Figure 4.7: Research approach adopted for this study](Source: Author)

In the social sciences, the notion of triangulation can be traced back to Campbell and Fiske’s (1959) use of multiple quantitative methods for assessing convergent and divergent validity. Denzin (1978), however, distinguished such within-method triangulation, or the application of multiple data collection and/or analysis techniques within an overarching research method (e.g., the survey), from between-method triangulation, representing a more genuine synthesis between dissimilar methods (e.g., case study and survey methods). The emphasis of the present paper falls within the latter, arguably more rewarding but also complex and challenging form of method triangulation (Denzin, 1978; Jick, 1979). The rationale for between-method triangulation is that it offers some advantages in dealing with validity threats stemming from the biases inherent in any single method. By combining relatively diverging methods, such that the relative strengths of one counter-balance the weaknesses of the other(s), researchers may enhance the credibility of their results whilst reducing the risk of observations reflecting some unique method artefact (Denzin, 1978).

Triangulation between case study and survey methods arguably provides a relatively potent means of assessing the degree of convergence as well as elaborating on divergences...
between results obtained (Brewer and Hunter, 1989; Jick, 1979; Sieber, 1973). For example, surveys may improve our understanding of the incidence of a particular phenomenon and/or the form and strength of conceptual relationships observed in case studies. On the other hand, case study methods may add to a more holistic and richer contextual understanding of survey results and help to explain apparent anomalies or puzzles emerging from the latter.

4.3.2 Sampling Strategy and Data Collection

The Sampling Strategy
Mixed Methods sampling requires an understanding and acknowledgement of sampling strategies that occur in QUAN and QUAL research. Probability sampling techniques are used most often in QUAN research to obtain a sample that most accurately represents the entire population. Purposive sampling techniques are used mainly in QUAL research to select participants or other units of study who can provide or yield data that will address the research questions. Although convenience sampling is sometimes used in QUAL and QUAN research, it includes samples that are the most available to the researcher; these may not be representative of the population being studied and may yield biased data. Because techniques for mixed methods include choosing participants for a study using both probability and purposive sampling, a comparison of purposive sampling techniques is presented in the table 4.4 below:
Mixed methods sampling includes characteristics of both purposive and probability sampling. Combining sampling techniques for QUAL and QUAN methods are usually made before the study begins. In the absence of an established classification or typology for mixed methods sampling strategies, Teddlie and Tashakkori (2009) discussed strategies for sampling and mixed method designs from the perspectives of probability and purposive sampling.

One of the basic mixed method sampling technique is stratified purposive sampling. This involves identifying subgroups in a population and then selecting cases (participants) from each subgroup and compare and contrast across the subgroups. Purposive random sampling involves selecting a random sample of a small number of units (participants) from a larger population (Kemper, Stringfield and Teddlie, 2003). Random selection of this sample reflects probability sampling, and the smaller number of participants selected reflects purposive sampling.
Zone A consists of totally qualitative (QUAL) research with purposive sampling, whereas Zone E consists of totally quantitative (QUAN) research with probability sampling. Zone B represents primarily QUAL research, with some QUAN components. Zone D represents primarily QUAN research with some QUAL components. Zone C represents totally integrated mixed methods (MM) research and sampling. The arrow represents the purposive-mixed-probability sampling continuum. Movement toward the middle of continuum indicates a greater integration of research methods and sampling. Movement away from the centre (and toward either end) indicates that research methods and sampling (QUAN and QUAL) are more separated or distinct (Teddlie, 2005)

In sequential mixed method sampling, researchers select units of analysis (e.g., participants) by using probability and purposive sampling strategies, one after another. That is, probability sampling for the QUAN phase is followed by purposive sampling for the QUAL phase is followed by purposive sampling for the QUAL phase or vice versa. Whereas in parallel mixed methods as in the case of this research, probability and purposive sampling strategies

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**Figure 4.8: Characteristics of Mixed Method Sampling**

Source: Teddlie (2005)

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**Figure 4.9: A quick snapshot of difference between quantitative vs. quantitative sampling**

Qualitative research typically involves **purposeful sampling** to enhance understanding of the information-rich case (Patton, 1990). **Quantitative research** ideally involves **probability sampling** to permit statistical inferences to be made.

**Qualitative methods** place primary emphasis on **saturation** (i.e., obtaining a comprehensive understanding by continuing to sample until no new substantive information is acquired) (Miles and Huberman 1994). **Quantitative methods** place primary emphasis on **generalizability** (i.e., ensuring that the knowledge gained is representative of the population from which the sample was drawn).
are used concurrently or with a slight time lapse between each phase. A probability sampling is used to produce data for the QUAN phase and purposive sampling produces data for the QUAL phase. These two sampling procedures are used to generate separates sets of data. Parallel mixed methods sampling can also occur when the participants are selected using both probability and purposive sampling (Teddlie and Tashakkori, 2009).

The sampling technique used in this study is illustrated in the figure 4.10 below.

As defined in Chapter 2 (Literature Review), the traditional businesses in India are those that sell their products through a multi-tier distribution network to the end-consumer (Mulky, 2013). In this study, the population of interest were the traditional businesses in India that manufactured and sold consumer products through the conventional distribution network. As the quantitative part of this study involved descriptive research design, the sample traditional businesses in the consumer goods segment, were randomly selected from the industry segments as mentioned below. Therefore, stratified random sampling was used for this descriptive study part of this research (see figure 4.10) that helped sample companies from the below mentioned industry segments (strata).

1. Apparel
2. Bags and Luggage
3. Beauty and Health
4. Consumer Electronics
5. Food Products and
6. Footwear

On the other hand, a criterion sampling method was adopted for the qualitative case studies. Three case companies were selected based on the criterion:

a) The companies must be producing and selling consumer products like apparel, food products, footwear, bags, consumer electronics, cosmetics etc.

b) The products are already sold or are saleable through online retail channels.
**Data Collection**

As this research uses mixed methods, the data collection involved survey questionnaire as instrument for quantitative study and face-to-face interviews, examination of existing business applications, process documents and existing data as an instrument for qualitative study. The first step towards development of questionnaire for both the methods (QUAN and QUAL) involved identification of two themes as mentioned in section 3.1 of chapter 3. The broad themes were then further broken down into sub and sub-sub themes that formed the basis of questionnaire development for both quantitative and qualitative study of this research.

**Questionnaire Preparation**

After identification of the themes, sub-themes and sub-sub themes, a draft closed ended structured questionnaire for survey with categorical responses using nominal and ordinal scales, was prepared to answer the research questions. The next step was pre-testing the survey instrument to certify its validity and to identify changes needed prior to administering the final version of the questionnaire.

**Pilot Study**
Pre-testing is an essential part of the questionnaire development process (e.g., Cavana et al., 2001; Malhotra et al., 2004). It helps the researcher to identify and remove any potential problems prior to administering the survey (Burns & Bush, 2003; Cavana et al., 2001; Neuman, 2006). As there are usually several limitations to each of the pre-test methods, the use of different combinations of approaches has been recommended (e.g., Malhotra, 2004; Churchill, 1995).

The questionnaire used in this study was pilot tested. The purpose of the pilot study was two-fold: a) To examine and verify the appropriateness of the questionnaire; and b) to ascertain the readability and appropriateness of the survey questions.

In this research, an expert panel and interviews were used to pre-test the questionnaire to get over the shortcoming of using one method. The questionnaire was first assessed and reviewed by the researcher’s supervisors to reach an agreement. Next, the instrument was pre-tested through interviewing senior leadership team members of three potential respondent companies and in addition, a small field test with 25 companies was also conducted. The interviews with the senior leaders of potential respondent companies lasted for about 1.5 to 2 hours each. Post this step, some minor changes were made which included, making some of the questions optional as not all companies will be willing to share the information. Since there were no adverse comments received from the pilot study participants, the resultant questionnaire was finalized for the main study.

In addition to the survey questionnaire, semi-structured open ended interview questions around the identified themes and sub-themes were prepared to help conduct case studies at three selected case companies. The questionnaire used in this study is presented in Appendix-A.

The Data Collection Process

The following figure 4.11, illustrates the data-collection process employed in this study.
The Profile of Survey Companies

The closed-ended, structured questionnaire that had categorical responses was sent to an initial sample size of 200 companies. The questionnaire was administered through email, google forms and personal meetings with managers of the selected sample companies. Of the 200 companies, 85 responses were useful for progressing with this research and the rest 115 were invalid and could not be used. The following figure 4.12 depicts the number of useful responses received by industry segments.

![Figure 4.12: No. of useful responses received by industry segment](image)

The table 4.5 below presents an industry wise summary of the number of companies to which questionnaire was administered versus number of responses received.
### Table 4.5: Industry-wise summary of number of companies (questionnaire sent to)

<table>
<thead>
<tr>
<th>Industry Segment</th>
<th>Approximate Sales Turnover of the Company (in INR Crores)</th>
<th>No. of Questionnaire Sent to</th>
<th>No. of Invalid Responses Received</th>
<th>No. of Useful Responses Received</th>
<th>Useful Responses as % of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparel</td>
<td>a) less than 50 crores</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>50%</td>
</tr>
<tr>
<td>Apparel</td>
<td>b) 50- 100 crores</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>33%</td>
</tr>
<tr>
<td>Apparel</td>
<td>c) 101 - 500 crores</td>
<td>7</td>
<td>5</td>
<td>2</td>
<td>29%</td>
</tr>
<tr>
<td>Apparel</td>
<td>d) 501 -1000 crores</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>40%</td>
</tr>
<tr>
<td>Apparel</td>
<td>e) greater than 1000 crores</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>40%</td>
</tr>
<tr>
<td>Bags and Luggage</td>
<td>a) less than 50 crores</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Bags and Luggage</td>
<td>b) 50- 100 crores</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Bags and Luggage</td>
<td>c) 101 - 500 crores</td>
<td>7</td>
<td>2</td>
<td>5</td>
<td>71%</td>
</tr>
<tr>
<td>Bags and Luggage</td>
<td>d) 501 -1000 crores</td>
<td>7</td>
<td>4</td>
<td>3</td>
<td>43%</td>
</tr>
<tr>
<td>Bags and Luggage</td>
<td>e) greater than 1000 crores</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>50%</td>
</tr>
<tr>
<td>Beauty and Health</td>
<td>a) less than 50 crores</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>50%</td>
</tr>
<tr>
<td>Beauty and Health</td>
<td>b) 50- 100 crores</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Beauty and Health</td>
<td>c) 101 - 500 crores</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>50%</td>
</tr>
<tr>
<td>Beauty and Health</td>
<td>d) 501 -1000 crores</td>
<td>9</td>
<td>4</td>
<td>5</td>
<td>56%</td>
</tr>
<tr>
<td>Beauty and Health</td>
<td>e) greater than 1000 crores</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>40%</td>
</tr>
<tr>
<td>Consumer Electronics</td>
<td>a) less than 50 crores</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Consumer Electronics</td>
<td>b) 50- 100 crores</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Consumer Electronics</td>
<td>c) 101 - 500 crores</td>
<td>10</td>
<td>6</td>
<td>4</td>
<td>40%</td>
</tr>
<tr>
<td>Consumer Electronics</td>
<td>d) 501 -1000 crores</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>67%</td>
</tr>
<tr>
<td>Consumer Electronics</td>
<td>e) greater than 1000 crores</td>
<td>13</td>
<td>3</td>
<td>10</td>
<td>77%</td>
</tr>
<tr>
<td>Food Products</td>
<td>a) less than 50 crores</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Food Products</td>
<td>b) 50- 100 crores</td>
<td>8</td>
<td>6</td>
<td>2</td>
<td>25%</td>
</tr>
<tr>
<td>Food Products</td>
<td>c) 101 - 500 crores</td>
<td>8</td>
<td>2</td>
<td>6</td>
<td>75%</td>
</tr>
<tr>
<td>Food Products</td>
<td>d) 501 -1000 crores</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>33%</td>
</tr>
<tr>
<td>Food Products</td>
<td>e) greater than 1000 crores</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>50%</td>
</tr>
<tr>
<td>Footwear</td>
<td>a) less than 50 crores</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>Footwear</td>
<td>b) 50- 100 crores</td>
<td>12</td>
<td>12</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Footwear</td>
<td>c) 101 - 500 crores</td>
<td>11</td>
<td>9</td>
<td>2</td>
<td>18%</td>
</tr>
<tr>
<td>Industry Segment</td>
<td>Approximate Sales Turnover of the Company (in INR Crores)</td>
<td>No. of Questionnaire Sent to</td>
<td>No. of Invalid Responses Received</td>
<td>No. of Useful Responses Received</td>
<td>Useful Responses as % of total</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------------------------------------</td>
<td>-------------------------------</td>
<td>-----------------------------------</td>
<td>---------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Footwear</td>
<td>d) 501 -1000 crores</td>
<td>14</td>
<td>6</td>
<td>8</td>
<td>57%</td>
</tr>
<tr>
<td>Footwear</td>
<td>e) greater than 1000 crores</td>
<td>10</td>
<td>6</td>
<td>4</td>
<td>40%</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>200</strong></td>
<td><strong>115</strong></td>
<td><strong>85</strong></td>
<td></td>
<td><strong>43%</strong></td>
</tr>
</tbody>
</table>

The data collection process was conducted over a period of 9-10 months and the percentage of useful responses received were 43%, which makes it a total of 85 consumer products companies all over India.

In parallel, semi-structured, open ended questionnaire around the research themes aided the three-qualitative case studies process. The profiles of the both survey respondents and qualitative case companies are presented in section 4.5 and section 4.6 respectively.

### 4.3.3 Reliability and Validity of Research

As noted earlier in the section 4.2.2, in social sciences, the notion of triangulation can be traced back to Campbell and Fiske’s (1959) use of multiple quantitative methods for assessing convergent and divergent validity. Denzin (1978), however, distinguished such within-method triangulation, or the application of multiple data collection and/or analysis techniques within an overarching research method (e.g., the survey), from **between-method triangulation**, representing a more genuine synthesis between dissimilar methods (e.g., case study and survey methods).

The emphasis of the present paper falls within the latter, arguably more rewarding but also complex and challenging form of method triangulation (Denzin, 1978; Jick, 1979). The rationale for between-method triangulation is that it offers some advantages in dealing with validity threats stemming from the biases inherent in any single method.

As mentioned by Tashakkori and Teddlie (1998), internal validity can be conceptualised as to the degree to which we can trust the conclusions and inferences of the researcher regarding the causal association between variables or events. The **mixed-methods** results when combining the **qualitative** and **quantitative methods** further contribute to the validity and reliability of key issues. The correspondence of the two methods ‘case studies’ and ‘descriptive survey’ design for the two key themes- “a) Customer Knowledge measure b) Customer Analytics Measure has been used to investigate the reality if traditional consumer
products companies’ have been using both variables. This is demonstrated using the mixed-methods.

Creswell (2003) mentioned a mixed-methods design format, where the investigator brings approaches that are included in both quantitative and qualitative formats related to the purpose and the research questions. This assisted to deploy a solid methodology to collect data from multiple sources to answer the two research questions by following the research purpose. The mixed-methods, though challenging and involving a great amount of work, followed the convergent design strategy (Creswell, 2003). There had been no ‘mixing’ of data from each methodology in the initial stages, as each data item from each method was analysed separately, presented in different chapters and later the data analysis from both methods is triangulated; and at the interpretation stage, there was a common analysis to arrive at the results. But each of the methodologies deployed was executed in parallel and converged at analysis and interpretation stage. For instance, the three case studies assisted to understand the in-depth qualitative insights into how traditional businesses are using customer data for gaining the competitive edge and survey results of 85 traditional companies helps gain descriptive insights into specific questions around the two key themes identified for this research.

Therefore, triangulation addresses the validity and reliability issues in research as follows:

• Advantages of each (QUAL AND QUAN) complement the other resulting in a stronger research design, and more valid and reliable findings.
• Inadequacies of individual methods are minimized.
• Threats to Internal Validity are realized and addressed.
• Triangulation between case study and survey methods arguably provides a relatively potent means of assessing the degree of convergence as well as elaborating on divergences between results obtained (Brewer and Hunter, 1989; Jick, 1979; Sieber, 1973).
• Surveys may improve our understanding of the incidence of a phenomenon and/or the form and strength of conceptual relationships observed in case studies.
• On the other hand, case study methods may add to a more holistic and richer contextual understanding of survey results and help to explain apparent anomalies or puzzles emerging from the latter.
• Quantitative design strives to control for bias so that facts, instances, phenomena can be understood in an objective way.
• Qualitative approach strives to understand the perspective of participants or a situation by looking at firsthand experience to provide meaningful data.

To ensure reliability and validity, the following procedures were adopted by the researcher in keeping with *mixed methods*:

- The physical presence for over 6 months representing approximately 200 hours spent in three different case companies in the consumer products business.
- There were structured and semi-structured face to face interviews conducted with senior leadership team with designations, CEO (Chief Executive Officer), CFO (Chief Finance Officer), Vice President, Director, Senior Manager and Managers, who have a wider domain (job responsibility) and administrative knowledge, implied high reliability of responses received.
- The customer analytics solutions and models created by the researcher during the case study process was validated by the senior leadership team of the case companies.
- The structured -closed ended survey questionnaire was run through a trial pilot phase with the senior executives approximately 25 companies to arrive at the final validated questionnaire for executing quantitative process.

### 4.3.4 Ethical Issues in research

The general ethical issues that apply to respondents at the data collection state, involve obtaining their informed consent; keeping their identities private and their answers confidential (Saunders, et al., 2007: 180). During the research process, researchers undertake a great responsibility for ethical issues such as the interest of interviewees’, sensitivity and privacy and ensure no harm is done do their physical, social and psychological well-being.

For this whole research, the author considered four key ethical issues viz., harm to participants, lack of interviewees’ consent, invasion of privacy and deception, as identified by Bryman and Bell (2011). The interviews were documented only after taking interviewees’ consent. In the case of survey questionnaire, the respondents were free to decide if they intended to participate or not. The research aim and objective were explained clearly to the interviewees, they were assured of data confidentiality and that it would be used only for this research and not elsewhere. Confidentiality and anonymity were ensured during the research process.

### 4.4 Profile of survey companies
This section presents the profile of the survey companies in the aspects, the company size (sales revenues), the industry segments they belong to, their number of employees, the products they sell, the profile of the channels by which their products get sold and the profiles of survey respondents.

4.4.1 Company Size (Sales Revenues)

The size of the survey companies that provided useful responses are as below in figure 4.13. While above 60% of companies that responded were having a turnover of > 500 crores, the data includes a good mix of companies of all sales turnover buckets. The responses from <100 crores companies have been very useful across all industry segments. The section 5.0 ‘Data Analysis’ further presents the various aspects of this research from a company size perspective as well.

![Figure 4.13: Size of survey companies](image)

Since there were fewer companies in the turnover segments ‘less than 50 crores’, ‘50-100 crores’ and ‘101-500 crores’, therefore, the researcher clubbed them under one category as ‘less than 500 crores’. The visual below (figure 4.14) presents them as three groups.

![Figure 4.14: Size of survey companies by three turnover groups](image)
4.4.2 Number of Employees

The data presented in the figure 4.15 goes to show that majority, 72 out of 85, i.e. about 84% of companies had more than 200 employees.

![Figure 4.15: Number of employees in survey companies](image)

4.4.3 Profile of Survey Respondents

The primary respondents to the survey questionnaire were as presented in table 4.6 below. To maintain anonymity, their names are withheld.

Table 4.6: Profile of survey respondents

<table>
<thead>
<tr>
<th>Designation/Department of Respondents</th>
<th>Industry Segment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Apparel</td>
</tr>
<tr>
<td>CEO</td>
<td>3</td>
</tr>
<tr>
<td>CFO</td>
<td>2</td>
</tr>
<tr>
<td>Managers and Senior Managers-TT</td>
<td>1</td>
</tr>
<tr>
<td>Managers and Senior Managers-Marketing</td>
<td>-</td>
</tr>
<tr>
<td>Managers and Senior Managers-Operations Department</td>
<td>3</td>
</tr>
<tr>
<td>Managers and Senior Managers-Retail and E-Commerce</td>
<td>-</td>
</tr>
<tr>
<td>Managers and Senior Managers-Sales and Distribution</td>
<td>-</td>
</tr>
</tbody>
</table>
The respondents were of the job titles CEO (Chief Executive Officer), CFO (Chief Finance Officer), Vice President, Director, Senior Manager and Manager. Since the respondents are senior-level executives who have a wider domain (job responsibility) and administrative knowledge, it implies high reliability of responses received.

### Figure 4.16: Departments of respondents

#### 4.4.4 Competition

When asked about the number of companies in the Indian Market that they consider as their direct competitor, figure 4.17 presents their responses. Only 2% of the respondents felt that they have less than 5 companies as their competitors in India whereas the rest have greater than 5. Greater the number of competitors, nimblier must be a company in this digital age to survive and remain profitable.
Another representation of the number of competitors of survey companies by industry segment is presented above in figure 4.18. There is tremendous competition in all the industry segments and the companies do acknowledge and realize that.

4.4.5 Sales Channels

As explained in section 2.1.3 of this thesis, the consumer products in India flow through a tiered distribution network before it reaches the end consumer. There are multiple intermediaries that have a role to play in the traditional distribution network viz. carrying and forwarding agents, whole-sales, distributors, sub-distributors, retailers and mom and pop stores. In addition to traditional distribution network, the consumer products are also sold through Modern Retail and E-Commerce channels. While out of 85 companies that had presence in e-commerce, in the current state only 3 of them are selling through their own e-commerce web sites, while the rest sell their products through other online intermediaries like Amazon, Flipkart and Snapdeal.

The visualization below in figure 4.19 presents the average sales % across various channels

<table>
<thead>
<tr>
<th>Channel</th>
<th>Average Sales (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. E Commerce</td>
<td>12.5</td>
</tr>
<tr>
<td>Avg. Modern Retail</td>
<td>41.2</td>
</tr>
<tr>
<td>Avg. Traditional</td>
<td>45.3</td>
</tr>
</tbody>
</table>
It can be observed that the survey companies have just started making a foray into E-Commerce selling. E-Commerce attributes to only 12.5% of total sales on an average. Traditional Distribution Network and Modern Retail remain their primary channels of sales. A further distribution of sales percentage by industry segment is also presented in the below figure 4.20. Apparel, Bags and Luggage, Beauty and Health segments have almost similar e-commerce sales characteristics. In fact, two Apparel companies and one Beauty and Health company were selling their products through company owned e-commerce web sites. Food products are still way behind in the e-commerce segment. The key point to note here is traditional distribution still dominates the sales in most segment and modern retail is not way behind. It is now important to investigate the number of levels of trade overall before the product reaches the end-consumer.

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2 the total for each industry does not add to 100% in some cases due to rounding error
**Tiered Distribution Network**

Given traditional distribution network attributing to over 45% of total sales (on an average), it was important to investigate the maximum number of layers in the distribution network of the survey companies, before their products reached the end-consumer. The consumer product companies have many customers at various levels of trade (primary, secondary, tertiary etc.) that act as intermediaries in the sales process until the product reaches the end consumer. Figure 4.21 below clearly shows that over 93% of the companies sell their products at least through three intermediaries before their product finally reaches the end consumer.

![Figure 4.21: Number of layers of distribution to end-consumer](image)

Therefore, it is difficult for most companies to get access to end consumer data as they are at least two-three levels away from them. While this aspect of customer data sufficiency is investigated in the Data Analysis Chapter 5.0, further in this section we look at the number of primary, secondary and tertiary customers of the survey companies in the visualization, figure 4.22.

At the first level of trade, most of the companies had greater than 100 customers (that are intermediaries). At level 2 and level 3 of trades, the majority of the survey companies had over 500 customers.
4.4.6 Profile of Products Sold

The profile of products sold by survey companies are shown in the figure 4.24 below. The number of active SKUs (Stock Keeping Units) sold by a majority of them is over 1000. In fact, 49% of them have over 5000 active SKUs. This goes to show that they have a large product portfolio to market and sell.

If we observe II) in the figure 4.24, 46% of the survey companies state that about 10-20% of their products attributed to over 80% of revenues. If we combine the data analysis of I) and II), it can be inferred that the survey companies have a long tail of products that they maintain, since only 10-30% of their products attribute to over 80% revenue.

The other aspect of understanding their products was the frequency of launch of new products. It can be observed from visualization III that majority of them (48%) launch new products in a short period of 3-6 months. In this digital age customers have access to immense amount of information and their wants and expectations are ever growing dynamically.
Therefore, it becomes very important for companies in this digital age to understand customer expectations and become customer obsessed to survive and thrive.

![Figure 4.23: Profile of products sold by survey companies](image)

### 4.5 Profile of case companies

The profile of the three case companies that formed a part of this thesis are presented in tables 4.7, 4.8 and 4.9. This covers the sales turnovers, the number of employees, number of products manufactured, number of active product categories, SKUs (Stock Keeping Units), channels of sales and percentage share revenues across channels.
Table 4.7: Sales turnover and number of employees of the case companies

<table>
<thead>
<tr>
<th>Company</th>
<th>Industry Segment</th>
<th>Company Turnover (approx.) in INR crores</th>
<th>No. of Employees (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company 1</td>
<td>Apparel and home décor items</td>
<td>120</td>
<td>300</td>
</tr>
<tr>
<td>Company 2</td>
<td>Food Products</td>
<td>600</td>
<td>350</td>
</tr>
<tr>
<td>Company 3</td>
<td>Apparel</td>
<td>50</td>
<td>60</td>
</tr>
</tbody>
</table>

Table 4.8: Products manufactured, number of active product categories, active SKUs

<table>
<thead>
<tr>
<th>Company</th>
<th>Industry Segment</th>
<th>Details of Products Manufactured</th>
<th>No. of Active Product Categories (approx.)</th>
<th>No. of Active SKUs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company 1</td>
<td>Home décor, dining and Apparel</td>
<td>Primarily Apparel and other luxury goods in the categories home décor and dining</td>
<td>12</td>
<td>88,000</td>
</tr>
<tr>
<td>Company 2</td>
<td>Food Products</td>
<td>Chips, Sauces, Spreads, Cake mixes, Milk shake mixes</td>
<td>40</td>
<td>450</td>
</tr>
<tr>
<td>Company 3</td>
<td>Apparel</td>
<td>Primarily Apparel. They also sell Travel Accessories</td>
<td>10</td>
<td>15,000</td>
</tr>
</tbody>
</table>

Table 4.9: Channels of sales and % share of business from each channel is presented here

<table>
<thead>
<tr>
<th>Company</th>
<th>Industry Segment</th>
<th>What are the various channels by which you sell your products?</th>
<th>Percentage of business from each sales channel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company 2</td>
<td>Apparel</td>
<td>a) Traditional Distribution Network, b) Organized Modern Retail, c) Ecommerce</td>
<td>0:85:15</td>
</tr>
<tr>
<td>Company 2</td>
<td>Food Products</td>
<td>a) Traditional Distribution Network, b) Organized Modern Retail, c) Ecommerce</td>
<td>60:35:5</td>
</tr>
<tr>
<td>Company 3</td>
<td>Apparel</td>
<td>b) Organized Modern Retail, c) Ecommerce</td>
<td>0:60:40</td>
</tr>
</tbody>
</table>