

**An empirical investigation of
Unsolicited Customer Input as a driver of Service Innovation**

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A thesis submitted to the London Business School
for the degree of Doctor of Philosophy

May 2012

Declaration

I certify that the thesis I have presented for examination for the PhD degree of the London Business School is solely my own work except for the parts of section 2.2 that were motivated and derived from my joint work with Professor Nuran Acur Bakir.

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An Empirical Investigation of Unsolicited Customer Input as a driver of Service Innovation

Abstract

This thesis examines the role of Unsolicited Customer Input as a potential driver of Service Innovation by studying the process through which firms can derive innovation generating insights from Unsolicited Customer Input, and the external as well as the internal factors that may affect such a process. Three research questions are put forward and addressed: (1) How do firms leverage Unsolicited Customer Input as a source of ideas for Service Innovation? (2) What are the factors that impact a firm's ability to do so? (3) What impact does the use of Unsolicited Customer Input in New Service Development (NSD) have on the NSD outcomes such as NSD Speed, NSD Success, and the Type of innovation pursued?

First, extant literature on service innovation and NSD that focuses on customer involvement in service innovation is reviewed and an initial set of propositions is formulated. These propositions are refined and extended through a case-based empirical investigation based on data collected from eight service firms. The case data identifies specific processes and factors that distinguish the firms that are able to leverage the Unsolicited Customer Input in NSD from those firms that are unable to do so. These include operational processes designed to facilitate the receipt, capture, analysis, and dissemination of customer input across the firm, and the processes that facilitate the utilization of these customer-input-driven insights in NSD activities.

A revised conceptual framework is developed, and then, the propositions are tested through a multi-respondent survey of service firms conducted specifically for this thesis. The results show a strong link between the operational processes designed to facilitate receipt, capture, analysis, and dissemination of customer input across the firm, including customer and service focus, slack available to firm employees, formal process, training, and incentives for firm employees, incentives for the customers to provide inputs to the firm, tolerance of negative information, and the firm's ability to obtain innovation-driving insights from the Unsolicited Customer Input. It also shows a strong, positive impact of the utilization of Unsolicited Customer Input in NSD on the nature, speed, and success of the firm's innovation efforts.

Ability to come up with new services that have a greater chance of success in the marketplace is the key to a firm's survival in today's face-paced and highly competitive market environment. Although the findings of this research need to be applied with caution given the limitations associated with the research methodologies used – case studies and survey, this research sheds light on the relatively unexplored and potently important role of Unsolicited Customer Input in driving service innovation, and can serve as a foundation for future research in this area. The final chapter of this dissertation describes the broad conclusions, limitations, and opportunities for future research with the hope that the research presented here will further the interest in these lines of inquiry, and lead to a stream of new research that further improves our understanding of service innovation and of the ways in which customer input can help service firms innovate.

Acknowledgements

My journey through the PhD program at London Business School has involved many ups and downs. While I have learned a lot from these experiences, my doctoral studies would have never come close to completion without the guidance, help, and support of many who gave me the courage to persist and get to this juncture. It is with tremendous gratitude that I acknowledge their support here.

First and foremost is my advisor, Professor Chris Voss, who always gave me the space I needed to learn, recover from the ups and downs, and emerge stronger from the set-backs. I will always be grateful to Chris for his valuable guidance, for his unwavering confidence in my abilities, and for his patience and generosity in supporting my research every step of the way. I would also like to thank my examiners – Prof. Roger Maull and Prof. Derek Bunn for their constructive criticism and valuable suggestions.

Next comes Professor Martin Starr, who continues to awe and inspire me with the passion with which he continues to pursue his ideas. Without his support and encouragement, I would have never reached this stage. Priyadarshan (PD) Mundhra of eClerx Services and Professor S. Ramamoorthy of D. D. Institute of Technology were instrumental in enabling my transition from industry to academia, and Professor John Kelly of Birkbeck College and Professor Richard Steinberg of London School of Economics played a key role in bringing my doctoral studies to a fruitful conclusion. Professor Adrian A. Done of IESE Business School, a graduating PhD student here at the London Business School when I joined the PhD program, kindly shared his experience in preparing a doctoral research proposal and helped me get a solid start in my research. I take this opportunity to thank these individuals for their support and guidance.

I also thank my PhD transfer committee members, Professor Kamalini Ramdas and Professor Julian Birkinshaw, who gave valuable suggestions and encouragement; the PhD program team members - Jenny, Vaishali, and Judith, who were always there to support, guide and encourage; and fellow PhD student (and now Dr.) Chris Parker, who made this journey a lot more enjoyable.

I am also grateful to the companies and their personnel who participated in the case studies and the survey that are part of this research. The time and willingness of so many people to openly share their information and thoughts with me leave me with the feelings of privilege and gratefulness.

Professor Nitin Bakshi and Professor Nicos Savva provided valuable guidance in my job search activities, and other MSO faculty members including Professor Kamalini Ramdas, Professor Jérémie Gallien, Professor Vasiliki Kostami, Professor Song Alex Yang, and all of the MSO PhD students provided valuable feedback on my research presentations. I also thank MSO Teaching & Research Co-ordinator Dr Paul G. Ellis, who always went out of his way to help and smiled along the way; and the MSO admin team including Suzanne Shapiro, Lydia Mais, and Sabyn Jillani, who directly and indirectly provided all the support I could possibly ask for.

Finally, I must also thank those who most endured the unintentional consequences of my decision to pursue a PhD. This includes my family members – my wife Bhavna and my son Kevin, who did not get as much of my time as I would have wanted to share with them, but never complained; and my parents – Maganlal and Ansuyaben Kakkad, who did their best to support me, even when doing so created disruptions to their own lives. I look forward to being able to spend more time with them now that this process is drawing to a close.

To my daughter Ria (2010 - 2010),
who never came home....

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Chapter 1. Introduction

1.1 Introduction

There is increasing interest among scholars in the process of service innovation – the process through which service firms come up with new services. There is also a broad consensus that service innovation is important. Service firms face an uphill task given the lack of patent or similar intellectual property protection that product firms enjoy, which allows service innovations to be copied more easily. In this context, ability to come up with service innovations that strike a chord with those who ultimately use the service – i.e. the customers, is crucial for the continued success of most service firms.

While the literature clearly highlights the importance of service innovation and the role of customers as one of the primary sources of innovation for service firms (Abramovici and Bancel-Charensol, 2004; Alam, 2006a; Alam and Perry, 2002; Gassmann, Sandmeier, and Wecht, 2006; Jeppesen, 2005; Leonard and Rayport, 1997; Lettl, Herstatt, and Gemuenden, 2006; Matthing, Kristensson, Gustafsson, and Parasuraman, 2006; Matthing, Sanden, and Edvardsson, 2004; Morrison, Roberts, and von Hippel, 2000; Nambisan, 2002; Thomke and von Hippel, 2002; Ulwick, 2002; von Hippel, 2001a; von Hippel and Katz, 2002), it mostly focuses on examining the role of *Solicited Customer Input* (in which, the firm initiates the contact) in the New Service Development (NSD) process, virtually ignoring the more frequent and richer type of customer input – the *Unsolicited Customer Input* (in which, the customer initiates the contact). Customers may provide such input to the firm when the service exceeds or fails to meet their expectations - with the later more likely than the former. While these inputs mostly contain insights regarding what the firm can do to improve the existing service offerings; they also contain insights that may help the firms develop new service offerings that meet customers' presently unmet needs. So, this input can be immensely valuable not only in improving the existing service offerings, but also in driving the firm's NSD initiatives.

Even though the service quality and service recovery literatures do analyze the role of *Unsolicited Customer Input* in detail, they do so only in the context of service recovery. While these studies do highlight the fact that the *Unsolicited Customer Input* can also be a very valuable source of ideas for NSD and service innovation, none of them shed further light on the topic (Sampson, 1996). Also, while the NSD literature closely examines how the firms can take the ideas from inception to final launch (i.e. the process of NSD) including common practices and success factors (Atuahene-Gima, 1996; Cooper, 1994; de Brentani, 1989, 1991; Froehle and Roth, 2007; Froehle, Roth, Chase, and Voss, 2000; Vermeulen, de Jong, and O'Shaughnessy, 2005), it pays very little attention to the process through which the firms can generate these innovative ideas in the first place – a stage where the *Unsolicited Customer Input* can play a major role. Similarly, the Business Process Management (BPM) literature also examines *Unsolicited Customer Input* (Childe, Maull, and Bennett, 1994; Kumar, Smart, Maddern, and Maull, 2008; Maull, Tranfield, and Maull, 2003; Maull, Weaver, Childe, Smart, and Bennett, 1995; Smart, Maull, Radnor, and Housel, 2003), but only with the goal of improving existing business processes for the firm.

While potentially beneficial, the use of insights contained in the *Unsolicited Customer Input* is not a trivial task for the firm. First of all, not all customers choose to spend the time and effort required to provide unsolicited inputs to the firm, and even when they do so, the input may not be given directly to the firm (Tax and Brown, 1998), and may not be open and honest (Voss, Roth, Rosenzweig, Blackmon, and Chase, 2004). Second, the negativity that generally

surrounds the Unsolicited Customer Input results in resistance and distortion of the message across process stages within the firm (Fornell and Westbrook, 1984; Homburg and Fürst, 2005; March and Simon, 1958; Matlin and Stang, 1978; O'Reilly and Roberts, 1974; Read, 1962; Roberts and O'Reilly, 1974; Rosen and Tesser, 1970; Tesser and Rosen, 1975). In addition, the lack of focus and the resulting dispersed nature of the information contained in the unsolicited input make the utilization of these insights very effort-intensive for the firm. Unlike Solicited Customer Input that is normally focused on specific issues or services, Unsolicited Customer Input does not follow any norms, structures or patterns, making it difficult to analyze (Koca and Brombacher, 2008). Part of the difficulty also stems from the fact that this highly dispersed information may not solely relate to current or planned set of offerings or capabilities of the firm, making it highly likely to be discarded by those analyzing the input. Even after the insights are captured, the time-lag between the capture and when an opportunity to utilize these insights comes up results in the need to code, classify and store the insights to facilitate search and retrieval in the future, adding another layer of complexity for the firm. Finally, the ad-hoc nature of NSD processes that many service firms tend to follow (Cooper, Easingwood, Edgett, Kleinschmidt, and Storey, 1994; de Brentani, 1989; Griffin, 1997a; Griffin, 1997b; Menor, Tatikonda, and Sampson, 2002; Shostack, 1984), risk the entire effort going waste if the NSD teams do not actually take the time to search and utilize potentially useful insights from the repository of Unsolicited Customer Input-based insights.

While organizations face many obstacles in enabling the use of Unsolicited Customer Input in NSD and service innovation activities, it seems that there is very little fine-grained research that can guide organizations in this endeavor. Therefore, an important gap in the literature exists, stemming from a lack of research that examines how firms can utilize insights contained in the Unsolicited Customer Input as a source of ideas to drive service innovation. This is a fundamental question within the domain of NSD and service innovation that the current literature does not seem to address fully.

To address this gap, this dissertation examines the use of Unsolicited Customer Input as a source of ideas for service innovation, using a multi-method research design that combines a qualitative study with a quantitative study. Chapter 2 presents a review of the NSD, service quality, and service recovery literatures to develop an understanding of the role of customer input as a driver of firm action in the context of service innovation. Chapter 3 describes a theory driven conceptual framework that is refined and extended through a case study of eight service firms. The case studies shed light on the processes used by the case firms to enable receipt, analysis and utilization of Unsolicited Customer Input, and help identify factors that play a critical role in this process. Chapters 4 and 5 test this framework and related propositions through a wide-scale survey of service firms, and empirically assess the propositions that relate to the process through which a firm can use the Unsolicited Customer Input in NSD, and the impact of such use on NSD outcomes. Chapter 6 presents conclusions, limitations, and the opportunities for further research. This is followed by appendices and a bibliography of the literature cited throughout the thesis. The next subsection (1.2) provides an overview of the research focus of the three essays that are presented in chapters 3, 4, and 5; and is followed by subsection 1.3 which briefly covers the epistemological commitments made in the course of conducting this research.

1.2 Research Focus

In order to leverage Unsolicited Customer Input in NSD, service firms need to understand the process through which the input can be used as a source of ideas for innovation, the external as

well as the internal factors that can affect a firm's ability to benefit from this effort, and the effect of such use on the performance measures of NSD. By addressing these issues, the three essays presented in this thesis aim to contribute to the NSD and service innovation literature, especially the stream that examines the role of customer involvement in NSD. The following sub-sections outline the broad research focus for each of the three essays.

1.2.1 How does Unsolicited Customer Input drive Service Innovation? An exploratory study

The essay in chapter 3 examines the role of Unsolicited Customer Input as a source of ideas for Service Innovation. Unsolicited Customer Input is the feedback that the firm receives directly or indirectly from the customer without the firm initiating the contact. Increasingly, organizations are recognizing the importance of involving customers in the NSD process, but existing NSD literature only examines the role of Solicited Customer Input in the NSD process. Studying the role played by the Unsolicited Customer Input in the NSD process sheds light on this relatively unexplored area of research, and by contrasting the best and the worst practice in the industry, advances the knowledge of the wider area of NSD. Through a focused review of the extant literature, we propose a conceptual framework and related propositions, and use data collected from a case study of 8 service firms to build an academically rigorous and grounded-in-practice model that can guide the future research and influence industry practice on customer-driven service innovation.

In this chapter, we address three specific research questions: (1) How do firms leverage Unsolicited Customer Input as a source of ideas for Service Innovation? (2) What are the factors that impact a firm's ability to do so? (3) What impact does the use of Unsolicited Customer Input in NSD have on the NSD outcomes such as NSD Speed, NSD Success, and Type of innovation pursued? The study concentrates on the four stages through which the Unsolicited Customer Input passes within the firm: receipt, capture, analysis, and utilization. Drawing on the relevant literature in service innovation and new service design, theory-based propositions are formulated and then refined with empirical data.

Using the case research methodology, empirical data was collected from eight case companies through interviews with those involved in the firm processes that connect customer input to NSD. These included the top management of the firm, firm employees responsible for customer care, and firm employees responsible for designing new services. The case data identifies specific processes and factors that may distinguish the firms that are able to leverage the Unsolicited Customer Input in NSD from the other firms that are unable to do so. These include processes specifically designed to encourage customer feedback; processes around receipt and capture of relevant customer details; processes around analysis, coding, and dissemination of customer input; and processes that facilitate utilization of these customer-input-driven insights in the NSD activities. The factors that affect this process include industry clockspeed, degree of customer and service focus across the organization, appropriate incentives for customers, a formal process for recording and analysing customer input, appropriate training and incentives for firm personnel, firm tolerance of negative information, and organizational slack. By capturing these observations in a conceptual framework that covers the process and the impact of utilizing Unsolicited Customer Input in NSD, this study opens up an exciting and important line of inquiry into the role of Unsolicited Customer Input in NSD and service innovation.

1.2.2 An empirical investigation of the process through which a firm can obtain innovation-driving insights from Unsolicited Customer Input

This essay (chapter 4) tests the initial parts of the conceptual framework put forward in chapter 3 that relate to the process through which firms can obtain innovation-driving insights from the Unsolicited Customer Input. Specifically, it tests the relevant propositions from the first three stages out of the four-stage conceptual framework (receipt, capture and communication, and analysis of customer feedback) that allow a firm to extract innovation-driving insights from the Unsolicited Customer Input. It uses the data collected through a large-scale multi-respondent survey of service firms located across the globe, and employs the Structural Equation Modelling (SEM) technique to empirically test the propositions after establishing scale reliability and validity through appropriate checks.

The results show a strong link between operational processes designed to facilitate receipt, capture, analysis, and dissemination of direct and indirect customer input across the firm, including customer and service focus, slack available to firm employees, a formal process, training, and incentives for firm employees, incentives for the customers to provide inputs to the firm, tolerance of negative information, and the firm's ability to obtain innovation-driving insights from the Unsolicited Customer Input.

1.2.3 The antecedents and the impact of using Unsolicited Customer Input-driven insights in NSD

The essay in chapter 5 tests parts of the conceptual framework and related propositions put forward in chapter 3 that correspond to the use of insights derived from Unsolicited Customer Input in NSD, and the impact of such use on NSD outcomes such as NSD success, NSD speed, and Type of innovation pursued by the firm. While still contested by a few (Campbell and Cooper, 1999; Ives and Olson, 1984; Magnusson, Matthing, and Kristensson, 2003), customer involvement in NSD is considered by most researchers to be not only useful, but also vital for the success of the NSD process (de Brentani, 1991; Matthing et al., 2006; von Hippel and Katz, 2002). Customer involvement is considered especially important during the initial and final stages of the NSD process which correspond to idea generation and service launch (Alam and Perry, 2002; von Hippel, 1986). While the impact of using Solicited Customer Input as a driver of innovation (focus groups, lead users, co-creation, tool kits for user innovation etc.) has been examined widely, the impact of using Unsolicited Customer Input (customer comments, feedback, complaints etc.) in NSD on the innovation outcomes has not been scrutinized as much. This chapter attempts to address this gap by testing the relevant propositions from the conceptual framework proposed earlier in chapter 3 through the large-scale multi-respondent survey of service firms initially described in chapter 4.

The results show a strong link between internal factors such as operational processes designed to facilitate analysis and dissemination of customer input across the firm, negativity in the feedback received, formality of the NSD process, training and incentives for the NSD employees, and the organization's ability to successfully leverage Unsolicited Customer Input as a driver of service innovation. It also shows a strong, positive impact of the utilization of Unsolicited Customer Input in NSD on the nature, speed, and success of the firm's innovation efforts. It finds that while the use of Unsolicited Customer Input does make the firm more likely to pursue incremental rather than radical innovations, it also leads to a shorter development cycle time and a greater chance of success for the new services.

1.3 Epistemological Commitments

Debates and conjectures about *what* is true presuppose prior agreement about *how* we determine whether or not something is true. Such an analysis involves ontological assumptions about the nature of the world (Bhaskar, 1975), epistemological assumption about how one can understand the world and communicate this as knowledge to fellow human beings, assumptions about the human nature and the relationship between the human beings and their environment, a selection of methodology to be used (Burrell and Morgan, 1982) and the type of reasoning that is applicable. It is especially important for the researchers engaged in any form of empirical research to demonstrate a reflexive understanding of their adoption of particular positions with regard to their research on these four dimensions (Johnson and Duberley, 2000).

Ontological assumptions:

Ontological question addresses the issue of whether the reality to be investigated is external to the individual (as held by the proponents of realism), or a product of the individual cognition or consciousness (as held by the proponents of nominalism). We hold that the reality to be investigated is external to the individual, and therefore amenable to empirical inquiry and transmission.

Epistemological assumptions:

Epistemological question fundamentally addresses the issue of how one can understand the world and communicate this as knowledge to fellow human beings. It looks at whether it is possible to identify and communicate the nature of knowledge as being hard, real, and capable of being transmitted in tangible form, or whether the knowledge is a softer, more subjective, spiritual or even transcendental kind, based on the experience and insight of a unique and essentially personal nature. I.e. it looks at whether the knowledge can be acquired or is something that has to be personally experienced. Epistemological commitments also provide tacit answers to questions about what are the origins, nature, and limits of scientific knowledge, what constitutes scientific practice, and what are the processes through which scientific knowledge advances. Epistemology is usually understood as being concerned with knowledge about knowledge. As stated by Johnson and Duberley (2000), "*management research can never be isolated from epistemological commitments whose diversity leads to different possible ways of approaching and engaging with any substantive area*". In any discipline where knowledge claims are to be made, epistemology contributes by clarifying the conditions and limits of what is construed as justified knowledge.

The positivist epistemology is one of the most widely used epistemological approaches in the field of management research. Positivist epistemologies seek to explain and predict what happens in the social world by searching for regularities and causal relationships between its constituent elements. On the other hand, anti-positivism perspective holds that the social world is essentially relativistic and can only be understood from the point of view of the individuals who are directly involved in the activities which are to be studied. From a positivistic perspective, the aim of research in the field of management is to generate causal relationships which govern the ways in which organizations operate. Knowledge of these causal relationships can enable managers to predict and control their environments. The focus is on the observable and the approach to the analysis of organizations assumes that their reality is objectively given, functionally necessary, and politically neutral (Willmott, 1992). Logical positivism assumes that there is a neutral point at which an observer can stand back and observe the external world objectively – termed the subject-object dualism where the

observations that are registered about an external social and natural world (i.e. the object) by a passive knower (i.e. the subject) are separate and independent of the processes of observation (i.e. a dualism). The concern to develop causal propositions supported by data and logic (Davis, 1985) underpins an emphasis on experimental and cross-sectional survey research designs using standardized measures to compare across situations. They entail the collection of data on a number of respondents or units, usually at a single juncture in time. The aim is generally to collect systematically a body of quantifiable data in respect of a number of variables which can then be examined to discern patterns of association (Bryman, 1992 p. 104). From the perspective of empiricism, empirical research is of utmost importance. Theories are accepted or rejected on the basis of their correspondence with the facts seen in the objective world.

Logical positivism comes from rationalism and empiricism, but the simultaneous commitment to induction and empiricism creates an internal contradiction. Therefore, we primarily use Popper's (1959) reformulation of positivism, that uses hypothetico-deductive method based on the principles of deduction and falsification. While logical positivism suggests that it is possible to verify and prove theories, Popper (1959) argues that it is only possible to falsify them. We rigorously study the phenomena of interest in order to be sure that we are getting to the truth against which we can then develop propositions and test our hypotheses. This involves the development of sophisticated, replicable data collection techniques to ensure that we can develop generalizable propositions that give insight or have predictive powers (Pugh, 1983).

A major criticism of positivist management research is that there has been a neglect of the need for relevance (Schon, 1995). Schon (1995) argues that management research sits on the high ground where manageable problems lead themselves to solution through the use of research-based theory and technique. However, the problems faced by the management practice are messy, confusing, and incapable of technical solution. By conducting a case-based study as the precursor to the survey, we aim to make our propositions and conceptual framework grounded in practice to ensure high relevance for the management practice.

Human nature:

The two views on this differ on how they look at the human nature and the relationship between the human beings and their environment. One view holds that the human beings and their experiences are a product of the environment (determinism); the other view holds that the human is the creator of his environment (voluntarism). Our research is based on the former.

Methodology:

If the view treats the social world as if it were a hard, external, objective reality, then the focus of a scientific endeavour is likely to focus upon an analysis of relationships and regularities between the various elements which it comprises (nomothetic). This view utilizes systematic protocol and technique, uses the process of testing hypotheses in accordance with the canons of scientific rigour using instruments such as surveys. The concern is with the identification and definition of the elements and with the discovery of the ways in which these relationships can be expressed. The methodological issues of importance are thus the concepts themselves, their measurement, and the identification of underlying themes. This perspective expresses itself most forcefully in a search for universal laws which explain and govern the reality which is being observed. If the view is the alternate (ideographic), which stresses the importance of the subjective experience of individuals in the creation of the social world, then the search for understanding focuses upon different issues. The principal concern is with an understanding of

the way in which the individual creates, modifies, and interprets the world in which he or she finds himself. The emphasis is placed upon the explanation and understanding of what is unique and particular to the individual rather than of what is general and universal. In methodological terms, it is an approach which emphasises the relativistic nature of the social world. Our research relies on the nomothetic methodology.

Reasoning:

Reasoning can be inductive or deductive. Deductive reasoning works from the more general to the more specific, and is considered a "top-down" approach. It starts with a broad theory about the topic of interest that leads to a set of specific testable hypotheses. The scope is narrowed down further when observations are collected to address the hypotheses, and the data from these observations allows the hypotheses to be tested, leading to a confirmation (or not) of the original theory. Inductive reasoning works exactly the other way, moving from specific observations to broader generalizations and theories, and is called a "bottom up" approach. Inductive reasoning begins with specific observations and measures, followed by the detection of patterns and regularities, formulation of tentative hypotheses for exploration, and finally to development of some general conclusions or theories.

These two methods of reasoning have a very different "feel" to them. Inductive reasoning, by its very nature, is more open-ended and exploratory, especially at the beginning. Deductive reasoning is narrower in nature and is concerned with testing or confirming hypotheses. Even though a particular study may look purely deductive, most social research involves both inductive and deductive reasoning processes at some time in the project. Even in the most constrained experiment, the researchers may observe patterns in the data that lead them to develop new theories. With deductive arguments, the conclusions are already contained, even if implicitly, in the premises, and therefore the testing does not provide any new information. Inductive arguments, on the other hand, do provide the researcher with new ideas and thus may expand his knowledge about the world in a way that is impossible for deductive arguments to achieve. Our case-based study starts with deductive reasoning, but then ends up combining inductive reasoning with the deductive reasoning. The survey-based study uses only deductive reasoning.

Chapter 2. Literature Review

2.1 Introduction

"The pursuit of knowledge with the tools of science is a cooperative, interdependent enterprise. The hundreds of hours spent conducting a scientific study ultimately contribute just one piece to an enormous puzzle. The value of any single study is derived as much from how it fits with previous work as from the study's intrinsic properties" (Cooper, 1998).

In order to identify potential gaps in the literature and to inform the direction of research undertaken for this dissertation, this chapter presents a literature review of relevant research streams including NSD and Service Innovation, Service Quality, and Service Recovery, with a specific emphasis on the role of customer inputs in service innovation.

Section 2.2 defines service innovation and reviews existing NSD literature that includes the typologies of service innovations, service innovation process models, and the role of technology in NSD.

Section 2.3 describes the importance of customer involvement in NSD and service innovation, and identifies two different types of customer inputs that a firm can potentially use in NSD – i.e. the solicited input and the unsolicited input.

Section 2.4 examines the literature that sheds light on the role of customer input in NSD and discovers that while customer input is considered immensely critical to the success of NSD activities, NSD research examines only the Solicited Customer Input as a source of innovation, and there is a dearth of research that examines the role of Unsolicited Customer Input in NSD.

Section 2.5 reviews service quality and service recovery literatures to analyze the context in which customers are likely to provide unsolicited input. While these streams of research carefully examine the process and the contextual factors that impact the judgment of service quality, which in turn drives the majority of Unsolicited Customer Input, such input is mostly looked at from the narrow goal of service recovery in the context of a service failure. While many researchers suggest that in addition to driving the service recovery efforts, such unsolicited input can be a valuable source of ideas for NSD and service innovation as well, there is a lack of research that actually examines the process of using Unsolicited Customer Input in such a context.

Section 2.6 summarizes the findings from the previous sections and concludes that current literature lacks in-depth studies that examine the role of Unsolicited Customer Input in the context of NSD.

2.2 Service Innovation

2.2.1 What is service innovation

Innovation is defined as "*the action or process of innovating – i.e. making changes in something established, especially by introducing new methods, ideas, or products*" (New Oxford Dictionary of English). Service innovation, therefore, refers to making changes in established services by introducing new methods or ideas, or coming up with entirely new services that are different from the existing services.

Service innovation is the goal of new service development activities. New Service Development (NSD) refers to the overall process of developing new service offerings (Johnson, Menor, Roth, and Chase, 2000) - from idea generation to launch or implementation (Cooper et al., 1994). It comprises of various activities that start with idea generation and concept development, and end with the successful launch of a new service (Johnson et al., 2000; Khurana and Rosenthal, 1997; Menor et al., 2002).

As one of the leading drivers of continued economic progress across countries, innovation has been widely researched across disciplines (Dziura, 2001). There are diverging views across disciplines as to what innovation is, and how it occurs. For example, the management and business literature considers innovation to be an application of the knowledge to produce new information, understanding, and awareness (Drucker, 1985); whereas the economists tend to view innovation either as quantifiable improvements in a product or a service, or as a vaguely defined positive outcome. This outcome can be an "*idea, practice or material artifact*" perceived as new by an individual (Rogers and Shoemaker, 1971 p. 19). Along similar lines, the organization literature views innovation as an acceptance or implementation of a new idea, process, product, or service (Thompson, 1965). For these studies, the focus is on the outcome rather than on the process through which these outcomes are achieved. On the other hand, organization theory and innovation literature primarily examines the process of innovation through which new ideas, objects, behaviors, and practices are created, developed, or implemented (Robertson, 1967; Zaltman, Duncan, and Holbek, 1973).

There is also a set of literature (primarily within the strategic management research stream) that focuses mainly on the initiation and implications of an innovation (in service, or service delivery) for the relevant markets and industries (Barras, 1986; Charitou and Markides, 2003; Easingwood, 1986; Kim and Mauborgne, 1997; Markides, 2006). As such, it considers how companies compete in the market with their innovative service offerings and what the results for this competitive process are (Glazer, 2007; McDonald and Srinivasan, 2004; Michel, Brown, and Gallan, Forthcoming). It describes innovation as a value creation process which should be commercially viable (Dziura, 2001; Kim and Mauborgne, 1997, 1999; Moller, 2006). The value creation process embraces new ways of competing in an existing business which are new to the industry or the market (Berry, Shankar, Parish, Cadwallader, and Dotzel, 2006; Charitou and Markides, 2003; Kim and Mauborgne, 1997; Markides, 2006).

2.2.2 Importance of service innovation

Services have become the driving force in developed countries as a major contributor to their GDP as well as employment growth, productivity and innovation (Machuca, González-Zamora, and Aguilar-Escobar, 2006; Spohrer and Maglio, 2008). Through servitization (Vandermerwe and Rada, 1988) of manufacturing, industries that were traditionally considered a part of the manufacturing world are also becoming a part of the service sector. Service innovation is becoming immensely important for businesses given the ever-evolving nature of markets, increasing dominance of services in the economies of developed as well as developing countries across the globe, and progress in science and technology that increases the pace of change in product as well as service industries (Batista, Smart, and Maull, 2008; Fitzsimmons and Fitzsimmons, 2001; Johnson et al., 2000). Corresponding with the increasing role played by services across the world, new service development process and innovation has emerged as one of the important and active areas of innovation management research (Flint, 2002; Slater and Narver, 1995).

2.2.3 Types of service innovation

Product innovations have generally been categorized by researchers into contrasting types such as incremental vs. radical, competence enhancing vs. competence destroying, and continuous vs. discontinuous (Ali, 1994; Cabello-Medina, Carmona-Lavado, and Valle-Cabrera, 2006; Gatignon, Tushman, Smith, and Anderson, 2002; Sheremata, 2004). Along similar lines, service innovations have also been classified as incremental or radical by many researchers (e.g. Johnson et al., 2000; Oke, 2007). Here, “incremental” innovation refers to an addition of new features to improve upon an existing offering (i.e., a product, service, or experience), and “radical” innovation refers to a real new offerings not previously available to an organization’s existing customers. In addition to the customer-related newness (de Brentani, 2001), the degree of newness can also be related to the existing service systems or concepts (Gallouj and Weinstein, 1997; Menor et al., 2002), or to the degree of change (Ettlie, Bridges, and O’Keefe, 1984) in the delivery process which is new not only to the customers, but also to the organization, the market, or the industry (Berry et al., 2006). It is argued that while incremental innovations result in minor improvements or simple adjustments to a product or service, radical innovations generate fundamental changes in the activities of an organization, a market, or even an entire industry (Garcia and Calantone, 2002).

Recently, business model innovation (also described as strategic innovation) has been added by strategic management researchers as a new type of service innovation. Business model innovation refers to a redefinition of existing products and/or services that is new to the industry and the market (Barras, 1986; Berry et al., 2006; Charitou and Markides, 2003; Markides, 2006). It is argued that organizations pursuing business model innovation generally find new ways of competing in an existing business (Berry et al., 2006; Markides, 2006).

In addition, service innovations can also be looked at from either a product or a process view point. A product view point examines innovating *the service itself* that is offered to the customer (Kimberly and Evanisko, 1981; Orfila-Sintes and Mattsson, 2008), whereas a process view is concerned with any innovation in the *process* through which the service is delivered to the customer (Gallouj and Weinstein, 1997; Johne and Storey, 1998).

2.2.4 Evolution of NSD process models

The NSD process can be defined as “*the set of activities, actions, tasks, and evaluations that move a project from the idea stage to the launch*” (Cooper et al., 1994; Johne and Storey, 1998). Typical stages are concept creation, analysis, detailed design, and launch (Froehle and Roth, 2007; Johnson et al., 2000). As the very first models of the innovation process were developed in the context of physical products (Booz, Allen, and Hamilton, 1982; Booz, 1968; Urban and Hauser, 1980; Wind, 1982), the initial efforts to develop service-specific innovation models were directed towards adapting NPD models to suit services (Bowers, 1987, 1989; Donnelly et al., 1985; Johnson et al., 1986). There has been an ongoing debate about how relevant these efforts are and whether service innovation requires a completely different approach from that used for product innovation (Bowers, 1989; Griffin, 1997b; Johne and Storey, 1998).

Service innovation models consider the innovation process to be either linear (rational) or non-linear (non-systematic). While the rational approach has a structured, systematic view of NSD process in terms of sequential stages (e.g. Bowers, 1989; Johne and Storey, 1998), the non-linear approach has no such well-defined system but uses a combination of rational measures

and intuition (e.g. Edvardsson, Haglund, and Mattsson, 1995; Kelly and Storey, 2000). The most common definition of a rational approach to the NSD process is given by Cooper et al. (1994) who see the NSD process as "*a set of activities, actions, tasks, and evaluations (project screening, market research, product development, test marketing) that move the project from the idea stage through to launch*" (p.283). On the other hand, non-linear models suggest that service innovations can be created and implemented on an ongoing basis through input to earlier stages (Menor et al., 2002). Most of the literature on NSD focuses more on the rational-systematic processes than on the non-linear processes.

The evolution of the innovation models ranging from rational to non-linear can be divided into four generations (Berkhout, Hartmann, Van Der Duin, and Ortt, 2006; Liyanage, Greenfield, and Don, 1999; Miller, 2001; Rothwell, 1994; Roussel, Saad, and Erickson, 1991). While the 1st and 2nd generation models represent rational approach to the NSD process, the 3rd and 4th generation models relate more closely to the non-linear process. While many researchers suggest that service companies should have a clear 'cascade' model of an unambiguous NSD process (e.g. Bowers, 1989; Johne and Storey, 1998), others question the suitability of such 1st and 2nd generation models of sequential processes in the context of NSD (Chesbrough, 2003; Christensen and Raynor, 2003; Niosi, 1999). In fact, many studies on the 3rd and 4th generation NSD models empirically show that most of the service companies often employ non-linear, informal and iterative processes during NSD (Edvardsson et al., 1995; Kelly et al., 2000; Menor et al., 2002). Non-systematic procedures resulting from flair, intuition and luck (Kelly et al., 2000; Perks et al., 2004) results in an iterative and non-linear service innovation process in these firms (Griffin, 1997b).

2.2.5 Technology and service innovation

Many academic researchers have recognized the critical importance of technology in the creation and delivery of services (Bitner, Brown, and Meuter, 2000; Dabholkar, 1994; Dabholkar, 1996; Parasuraman, 1996; Quinn, 1996). Technology allows a firm to remain connected to its customers and other partners, deliver certain types of services directly and instantaneously, and make the service delivery process very cost efficient (Kandampully, 2002). Advances in technology have directly influenced the growth and importance of services, in terms of independent service offerings and also as a component of product and service packages (Kandampully, 2002).

Technological progress not only acts as a source of service innovation, but also necessitates such innovation at times (Mendelson, 2000; Mendelson and Pillai, 1998). Specifically, advances in Information Technology (IT) have reduced the life-cycle of products, and have revolutionized the way in which business is conducted in the new economy (Kandampully, 2002). For example, some studies show that the traditional market-place interaction is being replaced by a market-space transaction (Rayport and Sviokla, 1994, 1995). The market-space is defined as "*a virtual realm where products and services exist as digital information and can be delivered through information-based channels*" (Rayport and Sviokla, 1995 p. 14). Kandampully (2002) defines service encounters as either high-touch (traditional face-to-face interaction) or high-tech (new age interactions that take place over long distance via a technology interface). With advances in IT, more and more services which have traditionally been high-touch are being converted into high-tech (Sundbo, 1997). For example, the internet enables customers to engage in a higher degree of self service (Hallowell, 2001). Self-service technologies (SSTs) are technological interfaces that enable customers to produce a service independent of direct service employee involvement (Meuter, Ostrom, Roundtree, and Bitner, 2000). Therefore, the

customers' ability and willingness to produce a service experience by correctly utilizing a technological interface as well as an organization's ability to train these customers in advance for the role they need to play in service creation and delivery are important aspects that need to be considered during the design of self-service configurations (Meuter et al., 2000).

Technology-based service innovations mostly create new markets or shift existing market structures and require user learning as they often induce significant behavioural changes in the users (Leifer, 2000; Lettl et al., 2006; Lynn, Morone, and Paulson, 1996; Urban, Weinberg, and Hauser, 1996). In addition, technology or knowledge brokering may also allow firms to innovate by applying technology or knowledge from other industries to the industry where that knowledge is not applied before (Hargadon and Sutton, 1997, 2000).

2.3 Customer Involvement in NSD and Service Innovation

"The role of the customer in service innovation should be contributing knowledge, skills and experiences; his or her willingness to share frustrations, requirements, problems and expectations; and his or her readiness to experiment and learn" (Prahalad and Ramaswamy, 2000 p. 80).

Existing research identifies many different customer roles for value creation in a service setting - ranging from being a resource or co-producer to a user (Finch, 1999; Gersuny and Rosengren, 1973; Kaulio, 1998; Lengnick-Hall, 1996; Nambisan, 2002). Customers contribute to the innovation cycle by generating consumer demand (Gupta and Mirjana, 2000; Vargo and Lusch, 2004) and by being by a source of ideas (Von Hippel, 2001; Von Hippel et al., 2002), apart from driving final success of the service as the sole judge of the service innovations introduced by the firm. Therefore, many scholars believe that the collaboration with customers is a valuable way for the firm to achieve both innovation and economic success (Biemans, 1992; Gales and Mansour-Cole, 1995; Gemunden, Heydebreck, and Herden, 1992; Håkansson and Snehota, 1995). Customer involvement may lead to new product ideas, enhanced product development effectiveness, and even reduced time to market for new products (e.g. Alam and Perry, 2002; Campbell and Cooper, 1999). As technology-based service provision replaces face-to-face service encounters, companies risk losing touch with their customers, and thereby an important source of ideas for their NSD process, making customer involvement in NSD even more crucial (Curran, Meuter, and Suprenant, 2003; Grönroos, 2000; Matthing et al., 2006). However, a lack of understanding of how to involve customers in the development process is seen by many as one of the reasons why service Innovation has remained an elusive task (de Brentani and Ragot, 1996; Johne and Storey, 1998).

2.3.1 Sources of service innovation

It has been argued that business success depends on an organization's ability to imagine and /or create a need (Pilzer, 1990). The process of innovation starts when an organization senses such an opportunity. There are many ways in which an organization can sense this potential, and each of these sources of innovation can play a role in an organization's ability to innovate. Also, a fit between the organizational strategy and the internal and external environments is a significant determinant of innovation performance (Anderson and Zeithaml, 1984; Atuahene-Gima, 1996; Miles, Snow, Meyer, and Coleman Jr, 1978; Venkatraman and Prescott, 1990). Therefore NSD is conceptualized as a strategic response to internal and external environments;

and success is determined by an efficient alignment of the resources and the process activities to these environments (Miles et al., 1978).

The resources of a service organization relate to three interrelated factors of modern business, namely: technology, knowledge, and networks (Kandampully, 2002). Broadly, the resource base includes people, process, physical infrastructure, internal and external customers, and the various alliances, networks, and partners (Kandampully, 2002). The early work on the sources of innovation mostly took a stakeholder view, treating each of these stakeholders as a potential source of innovation. Following the technology revolution in the 1990s, technology as well as technology and knowledge brokering have also been considered potential sources of innovation (Hargadon and Sutton, 1997, 2000).

The sources of innovation and the process through which firms obtain ideas for innovation from these sources are vital parts of the service innovation process. However, most of the existing research on NSD and service innovation considers the stage of idea generation as given and focuses predominantly on how the firm can take the ideas from the conceptualization to the market launch stage.

2.3.2 Importance of customer inputs as a source of innovation

Understanding customer needs is a vital part of any NSD process (Stevens and Dimitriadis, 2005). Because of the centrality and frequency of their interactions, customers are one of the most important and useful sources of information for firms (Kandampully, 2002; Voss et al., 2004). The customer input can help firms design and deliver new services as well as improve the quality of existing services. Firms receive customer input throughout the life cycle of a service – including pre-purchase, purchase, and post-purchase stages (Gupta and Vajic, 1999). This input can be solicited or unsolicited, positive or negative, and can be given directly to the firm or indirectly through other channels.

As a source of innovation, customer input provides firms with more than just the ideas for innovation. Even when the firm is able to come up with the same ideas that can be obtained from the customers, the ideas generated internally lack market credibility before they are tested in the market. On the other hand, the same ideas received from customers carry a sense of realism as they represent needs and desires of the customers themselves who are the final users of any new service introduced by a firm. Therefore, when they come from the customers, the same ideas can get attention and buy-in from senior management of the firm more easily.

2.3.3 Types of customer inputs – solicited and unsolicited

Customer inputs can be divided into two categories based on the locus of initiative: solicited, and unsolicited (Brockhoff, 2003). While solicitation for inputs can be directed (high degree of firm control over the selection of customers who receive the solicitation and issues on which the input is sought) or undirected (Brockhoff, 2003), unsolicited input is mostly undirected since firms cannot dictate who provides feedback and what they provide the feedback about. Sampson (1996; 1999) describes these two types of customer feedback as “*actively collected customer feedback*” and “*passively collected customer feedback*” based on whether the firm or the customer initiates the contact that conveys the customer feedback to the firm.

Firms can employ a variety of qualitative and quantitative market research techniques such as surveys, focus groups, consumer panels, one-on-one interviews, and customer observations to better understand customer needs (Cooper and Edgett, 1999; Griffin and Hauser, 1993; Rosenau Jr, Griffin, Castellion, and Anschuetz, 1996). The customer input that is put to use by each of these techniques falls under the category of “Solicited Customer Input” since the firm initiates the contact that conveys the customer feedback to the firm. Even though the firm can exercise a high degree of control over how, where, and when such input is solicited and who is chosen to provide the inputs, magnitude and frequency of such Solicited Customer Input can be limited given that the firm has to initiate the process, and the context in which the input is sought is generally quite specific or narrow (Sampson, 1996).

On the other hand, there are limited ways for the firm to get Unsolicited Customer Input, since apart from provisioning the channels through which the customers can reach the firm to provide feedback, the only thing a firm can do is to wait for the customer to initiate the contact. However, the frequency and magnitude of such input usually far outstrip those of the solicited input given that the unsolicited input does not need a firm initiative and is not limited to any specific context or service.

2.4 Solicited Customer Input and NSD

2.4.1 Customer involvement in NSD and service innovation

Customer involvement in service innovation is defined as “*those processes, deeds and interactions where a service provider collaborates with current (or potential) customers at the program and/or project level of service development, to anticipate customers' latent needs and develop new services accordingly*” (Matthing et al., 2004 p. 487).

While current literature includes a mix of conceptual and empirical papers on solicited customer involvement in innovation, a majority of these studies are actually focused on new product development (Anderson and Crocca, 1993; Ciccantelli and Magidson, 1993; Durgee, O'Connor, and Veryzer, 1998; Leonard and Rayport, 1997; von Hippel, 1986, 2001b). Despite widespread recognition in the literature that interacting with customers during the development process is critical for service innovation as well; relatively fewer studies have a primary focus on customer involvement in NSD (Alam, 2006a; Alam and Perry, 2002; Martin and Horne, 1995; Thomke, 2003). Even in terms of supporting techniques such as the lead-user method (von Hippel, 1986) and the tool kits for user innovation (Jeppesen, 2005; Thomke, 2006; von Hippel, 2001b; von Hippel and Katz, 2002), these are first and foremost developed and tested in a product context. Recent research on service-centered model (e.g. Langeard, Reffait, and Eiglier, 1986; Normann, 1984; Vargo and Lusch, 2004) suggests that customer involvement plays a more important role in service firms than it does in tangible product firms. Service-centered dominant logic implies that “*value is defined by and co-created with the consumer rather than embedded in the output*” (Vargo and Lusch, 2004 p. 6). This requires that firms move from a “make-and-sell” strategy to a “sense-and-respond” strategy (Haeckel, 1999), where sensing refers to sensing customer needs and requirements. Involving customers in NSD activities may allow the firm to learn directly from the customers about their requirements and needs, and reduce the gap between such needs and the firm's understanding of these needs. However, such customer involvement is insufficiently practiced in the context of NSD and service innovation (e.g. Gordon, Calantone, di Benedetto, and Kaminski, 1993; Martin and Horne, 1995; Matthing et al., 2006).

2.4.2 Key areas of research

While current literature considers customer involvement in service innovation to be very important (Alam, 2002, 2006a; Martin and Horne, 1995; Thomke, 2003), there are diverging views around whether such involvement is beneficial or not (Campbell and Cooper, 1999; de Brentani, 1991; Ives and Olson, 1984; Magnusson et al., 2003; Matthing et al., 2006; von Hippel and Katz, 2002). There is also a debate around how closely the firm should listen to the customer. Some researchers suggest that clear objectives of customer involvement in NSD are vital to ensure that the customer involvement contributes positively to the success of the overall NSD process (Alam and Perry, 2002; Anderson and Crocca, 1993). Many studies show that type of innovation pursued by the firm, and the stage in which customer involvement is sought (Alam and Perry, 2002; von Hippel, 1986) also contribute to whether the customer involvement proves to be beneficial. Taking a processual view, many studies examine the ways in which such customer involvement can take place including selection of customers for involvement in NSD activities (Gruner and Homburg, 2000; von Hippel, 1986), and the modes of actual customer involvement (Cicciarelli and Magidson, 1993; Durgee et al., 1998; Gustafsson, Ekdahl, and Edvardsson, 1999; Leonard and Rayport, 1997; Ulwick, 2002). Studies that focus on enablers for such customer involvement suggest that firms need to provide appropriate incentives for the customers as well as for the firm employees to promote interaction between these two groups (Nambisan, 2002). Taking a customer-centric view, another set of papers analyzes what motivates the customers to get involved in the innovation process (Martin, Horne, and Schultz, 1999; Olson and Bakke, 2001), and suggests that a firm doesn't always have to provide monetary incentives to encourage customer involvement in NSD activities.

Sections 2.4.3 to 2.4.9 describe these considerations in more detail to explore the emerging views on customer involvement in service innovation.

2.4.3 Is customer involvement in NSD beneficial?

There is an ongoing debate around the benefits of customer involvement in new product and service development, with many scholars arguing in favor of, and many arguing against customer involvement.

It has been argued that the interaction with the customers is a necessity for a successful innovation (e.g. McKenna, 1995; Wind and Mahajan, 1997). The suggested benefits include an increase in new service performance (e.g. de Brentani, 1991, 1995; de Brentani and Cooper, 1992; Edgett, 1994), an increase in the innovativeness and final success of the product or service (Biemans, 1992; Deschamps and Nayak, 1995; Gales and Mansour-Cole, 1995; Gemunden et al., 1992; Griffin and Hauser, 1993; Håkansson and Snehota, 1995; Lukas and Ferrell, 2000; McKenna, 1995; von Hippel, 1978, 1986), and a superior capture of market information in service design through a firsthand contact with the customers (Biemans, 1992; Gemunden et al., 1992; Li and Calantone, 1998; Matthing et al., 2006; Souder, 1988). As technology-based service provision replaces face-to-face service encounters, companies risk losing touch with their customers, and thereby an important source of information for their NSD process (Curran et al., 2003; Grönroos, 2000; Matting et al., 2006). Intensified interaction with the customers can help companies overcome this loss and improve the effectiveness of NSD process (Alam and Perry, 2002; Magnusson et al., 2003; Olson and Bakke, 2001; Thomke, 2003).

Many scholars believe that the impact of customer involvement in service / product development is not entirely positive. Some argue that customers and their input should be ignored, because the customers cannot tell a firm exactly what they want (Hamel and Prahalad, 1996; Simonson, 1993). More recently, Magnusson et al. (2003) conducted an experiment on the roles of user involvement in service innovation and found that the users' ideas were original but less producible. Along similar lines, Campbell et al. (1999) found that NPD projects involving customer partnerships were no more successful than those that did not involve such partnerships. Ives and Olson (1984) found in their meta-analysis on user involvement in designing management information systems that "*benefits of user involvement have not been strongly demonstrated*". Bidault et al. (1994) argue that such partnerships do not automatically guarantee success and that the tension between the logic of new product / service development and partnering may offset possible economic and technological advantages. Some researchers suggest that the managers are partly to blame for this controversy because they do not know how to interact with the customers and obtain input from them (Leonard and Rayport, 1997; Ulwick, 2002).

2.4.4 To what extent should the customers be involved and what should be asked from them?

Even when customer involvement in the development of innovative products or services is considered beneficial, there are differing prescriptions available across the literature regarding the stages of the development cycle in which customers should be involved, and the type of input that should be obtained from them. Customer involvement in all phases of the NSD process is considered important by some researchers (e.g. Callon, 1999; Cooper, 2001). As co-producers of services, customers can contribute to a variety of design and development activities, including idea generation or conceptualization, validation of architectural choices, design and prioritization of features, and establishment of development process priorities and metrics (Christensen, 1997; Leonard-Barton, 1995; Nambisan, 2002; Rothwell, Freeman, Horlsey, Jervis, Robertson, and Townsend, 1974; von Hippel, 1988). Customers can also play a highly productive role in the testing stage (e.g. Dolan and Matthews, 1993; Nambisan, 2002; Nielsen, 1993).

However, Brockhoff (2003) describes various degrees of customer involvement and argues that the optimal degree of customer involvement varies by the phase of the development process. As the integration of customers into the innovation process requires the firm to expend more time and resources (Lilien, Morrison, Searls, Sonnack, and von Hippel, 2002), firms must carefully decide the stages in which the customers should be involved. Some even argue that having too much customer input during the product conceptualization and design phases can be detrimental and can lower NPD effectiveness (Datar, Jordan, Kekre, Rajiv, and Srinivasan, 1996) as early customer integration into NPD may lead to incremental improvements of existing solutions rather than radically new breakthrough products (Christensen, 1997; Leonard-Barton, 1995; Nambisan, 2002; Rothwell et al., 1974; von Hippel, 1988).

There are also diverging views across the literature in terms of what should the customers be asked about - needs or solutions. On one hand, some argue that it can be hard for the customers to envision something that they have never experienced before (Flint, 2002; Matting et al., 2006; Ulwick, 2002). According to Ulwick (2002 p. 92), "*customers should not be trusted to come up with solutions as they are not innovation experts or informed enough for that part of the innovation process*". Rather, customers should be asked only for the outcomes- that is, what they want a new product or service to do for them. Also, people may

not be able to conceive of a solution because they may have apparently contradictory needs. Hence, consumers may not be able to articulate their needs clearly (von Hippel, 1986), or their needs may change as they use a given product (Rosenberg, 1982). On the other hand, concepts like user tool-kits preach exactly the opposite – they ask the firms to empower the customers so that the customers themselves can create their own solutions (von Hippel, 1986, 2001b; von Hippel and Katz, 2002; von Hippel, Thomke, and Sonnack, 1999).

2.4.5 How close should the firm be to the customer?

A close relationship with the customers presents firms with a potential paradox. According to the social networks theory, although close customers have a greater motivation to cooperate, they cannot provide access to potentially rich and diverse information (Granovetter, 1982; Krackhardt, 1992) that is necessary to drive radical innovation. By listening too closely to a select group of customers, a cooperative provider may end up as nothing more than a subcontractor for them (Johne, 1994). In addition, listening to customers too closely may result in incremental rather than bold improvements that leave the field open for competition (Ulwick, 2002).

2.4.6 What are the characteristics of customers that should be involved?

The characteristics of customers that can add the most value to NSD and service innovation activities has been an area of extensive research. It has been suggested that customers should be chosen for involvement in NSD activities according to their ability to appreciate the degree of newness of the future product as well as their potential stage-specific contributions (Brockhoff, 2003). Many studies have attempted to classify customers according to their ability to contribute to or adopt the outcome of an innovation effort. Intrinsic motivation (Amabile, 1996) and domain-specific knowledge (Goldsmith and Hofacker, 1991) may result in significant differences in the profiles of customers that are in a position to develop radical innovation from the profiles of those user types that are typically involved in incremental improvements (Lettl et al., 2006).

Research on human psychology also describes a general innovation component included in trait theories of personality that describes general reactions to the environment (Goldsmith, Flynn, and Goldsmith, 2003). For example, the Five Factor Model of Personality contains a trait called "openness to experience," which has been described as "*how willing people are to making adjustments in notions and activities in accordance with new ideas or situations*" (Popkins, 2004 p. 2). Along similar lines, Parasuraman (2000) came up with a "Technology Readiness" construct, which was operationalized by Matthing et al. (2006) as "Technology Readiness Index" and found to be a good predictor of innovativeness of the customer. Parasuraman and Colby (2001) identified five distinct customer segments, which they labeled as explorers - the lead users that are most prone to adopt and experiment with new technologies, followed by (in decreasing order of adoption propensity) pioneers, skeptics, paranoids, and laggards.

Many other researchers have also proposed that firms should direct their energies towards a small sample of lead users (Matthing et al., 2006; Olson and Bakke, 2001; Thomke and von Hippel, 2002; von Hippel, 1978; von Hippel, 1988). These lead users are "early birds" in discovering and acquiring new technology as well as new products and services (von Hippel, 1986). As such, lead users are not necessarily the same as "innovators" (Rogers, 2003).

Innovators are the first adopters of an innovative product or service immediately after its introduction whereas lead users are those who have well defined and more demanding needs than majority of the customers (Matthing et al., 2006). Even though previous research on lead users is mostly set in the context of product innovations (Pitta, Franzak, and Katsanis, 1996; von Hippel, 1986), it has been suggested that lead users in the context of services would also have similar characteristics, such as having a strong, well-developed set of needs and a willingness to participate in NSD to fulfill those needs (Morrison et al., 2000). However, others warn that limiting the customer involvement to only the lead users can be detrimental to the success of the product or service as the collaboration with lead users may result in the development of a product based on the needs of a highly vocal and visible set of customers who may not necessarily be representative of the firm's broad customer base (Nambisan, 2002).

2.4.7 Where and how should the interaction take place?

Where should the interaction with the customers take place?

It is suggested that the customer ought to be observed more closely in the customer's own environment (Deszca, Munro, and Noori, 1999; Martin and Horne, 1995; Matthing et al., 2004; Prahalad and Ramaswamy, 2000). Leonard and Rayport (1997) argue for these observations to be conducted in the course of a customer's normal, everyday routines through a process called empathic design. Empathic-design techniques involve a twist on the idea that new-product development should be guided by users. In this approach, they still do - they just don't know it. As such, empathic design is about 'where' as well as 'how', as it involves observations in a customer's own environment by a multi-functional team where at least one member of the team is experienced in behavioral observation and another member has a deep understanding of the organizational capabilities that the development team can draw upon. Most data are gathered from visual, auditory, and sensory cues instead of asking direct questions. This is followed by reflection, analysis, and development of a prototype.

How should the firm go about getting customer inputs?

There are a number of strongly allied concepts of customer involvement, such as the lead user method (von Hippel, 1986), co-development (Anderson and Crocca, 1993; Neale and Corkindale, 1998), co-opting customer competence (Prahalad and Ramaswamy, 2000), consumer involvement (Alam and Perry, 2002; Pitta et al., 1996), and customer interaction (Gruner and Homburg, 2000).

One set of papers argue for the use of structured inquiry mechanisms to obtain customer inputs for the innovation projects, citing that to achieve higher levels of collaboration in NPD and NSD, the different actors should possess common mental models regarding the goals and agendas, development priorities, process constraints, and assumptions (Jassawalla and Sashittal, 1998; Madhavan and Grover, 1998). Along these lines, Ulwick (2002) proposes a methodology for capturing customer input that focuses on the desired outcomes. The steps include developing a style of interviewing that is outcome based, conducting the interviews after selecting the most diverse set of individuals within each customer type, and then organizing the data and rating the outcomes using importance and current satisfaction level, before finally using the information to spur in-house innovation. However, other researchers

argue that the use of structured inquiry mechanisms significantly limits the richness and frequency of customer contributions (Nambisan, 2002).

2.4.8 What benefits do customers get from involvement in NSD?

Customers can gain several benefits by participating in new product and service development. These benefits include product or service related benefits, community related benefits, and medium related benefits (Nambisan, 2002). The product or service-related benefits include higher quality of a product or a service (Mills, 1986), incorporation of features that are valuable to the customer, knowledge gained about the product and the underlying technology (Dunn Jr and Thomas, 1994), and the satisfaction of a creative urge (Bateson, 1985). The community-related benefits include a shared social identity and a sense of belonging, interpersonal relationships, and a status conferred by the community (Kollock, 1999; McWilliam, 2000; Prahalad and Ramaswamy, 2000). The medium-related benefits include the positive customer experience provided by the communication medium (Nambisan, 2002).

However, customers' participation in the NSD process may require customers to incur various costs including effort, time and money. These costs might be influenced by the involvement of other customers, including those who compete for the same scarce resources or those who benefit from network effects, and could also lead to specific conflicts. These costs incurred by the customers during their participation in the NSD process call for a reward (Brockhoff, 2003).

2.4.9 What issues do the firms face in involving customers in NSD?

Investigations of how to integrate customers into innovation activities have provided several important managerial implications in terms of the organizational and methodical design of the innovation process (Herstatt, Verworn, Stockstrom, Nagahira, and Takahashi, 2004). Nevertheless, such integration still involves challenges and controversies. A firm may face many issues when trying to engage customers in its NSD efforts. These issues can be divided into two categories: customer-related issues, and firm-related issues.

According to Leonard-Barton (1995), the major customer-related issues faced by a firm when it tries to involve customers in NSD include the uncertainty associated with involving the customers in NSD arising from issues such as customer selection, determining the timing and intensity of customer involvement, customers' ability and willingness to provide the right kind of knowledge, and the nature and extent of the knowledge to be embodied. Alam (2006a) and Nambisan (2002) add establishment of ties with the customers, and confidentiality concerns as additional challenges. The lack of cooperation and commitment by the customers, and ambiguity surrounding the allocation of intellectual property rights (Campbell and Cooper, 1999; Littler, Leverick, and Bruce, 1995) may also limit the extent of customer involvement preferred by the firm.

If there are significant cultural differences between the customers and the front-line or R&D staff, the interface may bear high friction losses. Therefore, there is no guarantee that the customers' requirements are understood or articulated well (von Hippel and Katz, 2002). Even when such differences are not present, incentives may not be properly aligned for company staff to involve and work together with the customers (Matthing et al., 2004). A firm personnel's creativity may be restricted through the perceived pressure and control exerted by integrated customers that can force him or her in undesirable directions (Gassmann et al.,

2006). As a result, such a strong focus on the customer might alienate the firm from its inherent core competencies (Lilien et al., 2002). More time and involvement that need to be expended to integrate customers into the innovation process (Lilien et al., 2002), and logistical considerations involved in such integration efforts also force firms to involve only a minority of customers that are often unrepresentative of the diverse customer population (Wayland and Cole, 1997). Therefore, unless there is sufficient organizational slack available, a firm may find it difficult to integrate customers into the innovation process.

Increased need for supporting users who are involved in NSD and NPD activities has been examined in great detail by some researchers. They propose deploying a virtual customer environment where users support one another. Nambisan (2002) examines the design of such virtual customer environments by focusing on four underlying theoretical themes such as interaction pattern, knowledge creation, customer motivation, and virtual customer community-new product development team integration. It is argued that homophily (i.e., the degree to which pairs of individuals are alike in terms of certain attributes) between peer customers contributes to their effectiveness in understanding and appreciating the concerns of product users and their particular usage problems (Brown and Reingen, 1987; Kay, 1999).

The implementation of such online forums involves the deployment of a variety of technologies, including the internet, groupware, multimedia, streaming video, intelligent agents, virtual reality tools, and interactive sensory peripherals (Nambisan, 2002). Specific services provided can range from discussion and message boards, e-mail and mailing lists, and product/technology knowledge centers to web-based games, customer design forums, and virtual prototyping centers (Dahan and Hauser, 2002). For example, groupware collaborative and messaging tools can empower customers to help one another (Kambil, Friesen, and Sundaram, 1999), virtual reality tools can enable firms to implement internet-based product concept testing using visual depiction and animation for both industrial and consumer products (Dahan and Srinivasan, 2000), and new security tools can enable firms to create "gated" communities with privileged access for those customers who are perceived as potential innovators and contributors (Kay, 1999; Sawhney and Prandelli, 2000). Such online or virtual customer communities (VCCs) could facilitate the deployment of distributed innovation models that involve varied customer roles in NPD and NSD (Holmström, 2001; Kambil et al., 1999; Nambisan, 2002; Prahalad and Ramaswamy, 2000). VCCs enable a firm to bring its customers inside the organization's fold and transform them into "employees" or make them a part of the extended product development team (Nambisan, 2002).

While these virtual environments do offer radically new ways for customers to contribute to the value creation, the knowledge transactions so conducted may influence the nature of relationships between the customers and the firms, and lead to significantly different "psychological contracts" (Rousseau and Parks, 1993) between these two entities (Nambisan, 2002). As the loci of product innovations move towards firm peripheries (with customer communities playing an increasingly active role), the appropriateness of hierarchical governance mechanisms (epitomized by traditional R&D departments) may also become questionable (Eisenhardt and Brown, 1998).

2.5 Unsolicited Customer Input and NSD

2.5.1 When do customers provide unsolicited inputs?

Unsolicited or unprovoked feedback is more likely to be a result of a customer experiencing

delight or outrage – when the firm delivers exceptional or really poor service than when the customer is merely satisfied or dissatisfied (Sampson, 1996; Sampson, 1999). The two profoundly positive or negative affective states of delight and outrage result only when customer expectations are exceeded or unsatisfied by a surprising degree (Rust and Oliver, 2000, Schneider and Bowen, 1999, Voss et al., 2004). Delight is associated with a positive disconfirmation of emotions and cannot be achieved without surprisingly positive levels of performance (Rust and Oliver 2000). On the other hand, outrage is also associated with a higher degree of emotionality (Schneider and Bowen, 1999) and results when customers experience extreme dissatisfaction with the service. Dissatisfaction is also described as a state of cognitive/ affective discomfort caused by an insufficient return relative to the resources spent by the consumer at any stage of the purchase/consumption process (Fornell and Wernerfelt, 1987). Dissatisfied customers can complain, become irate, and even turn into activists. Schneider et al. (1999) suggested that focusing on delight and outrage, which are associated with more intense emotions than are satisfaction or dissatisfaction, may lead to a deeper understanding of the dynamics of customer emotions and their effect on behaviour, feedback, and loyalty.

2.5.2 Service quality and customer satisfaction

Customers usually compare their service experience to the expected levels of service quality, and feel delight, satisfaction, dissatisfaction, or outrage based on the strength and direction of the difference between the expected and the experienced levels of service. A customer's prior expectation of service quality thus acts as a key driver of Unsolicited Customer Input.

2.5.2.1 Service Quality

The search for quality was arguably the most important consumer trend of the 1980s (Parasuraman, Zeithaml, and Berry, 1985; Rabin, 1983). The impact of service quality on profit and other financial outcomes of the organization has also received a lot of attention (Rust, Zahorik, and Keiningham, 1995; Zeithaml, Berry, and Parasuraman, 1996). Service quality is one of the many variables including pricing, advertising, efficiency, and image that simultaneously influence profits (Zeithaml et al., 1996). Superior service quality can drive higher-than-normal market share growth, allow a firm to charge premium prices, and increase customer retention (Fornell and Wernerfelt, 1987; Zeithaml et al., 1996).

Efforts in defining and measuring quality came largely from the goods sector, especially in the beginning, and included concepts such as “zero defects”, “conformance to requirements” (Crosby, 1979), and minimizing the number of internal & external failures (Garvin, 1983; Parasuraman et al., 1985). However, the “Goods” approach to quality is not readily applicable to services given the many differences between the goods and the services. Unlike goods quality, which can be measured objectively by indicators such as durability and number of defects (Crosby, 1979; Garvin, 1983), service quality is an abstract and elusive construct. Services differ from products because of their unique features such as intangibility (Berry, 1980; Lovelock, 1983; Shostack, 1977), heterogeneity (Booms and Bitner, 1981; Parasuraman et al., 1985), inseparability of production and consumption (Bitner, 1990; Boulding, Kalra, Staelin, and Zeithaml, 1993; Carman and Langeard, 1980; Cronin and Taylor, 1992; Crosby, 1979; Grönroos, 1978; Parasuraman et al., 1985), and perishability (Sasser, Olsen, and Wyckoff, 1978; Zeithaml, Parasuraman, and Berry, 1985). Unlike goods, services are generally high on experience and credence properties and low on search properties (Darby and Karni, 1973,

Nelson, 1974, Parasuraman et al., 1985). Therefore, while the quality of tangible goods was being defined and measured with increasing levels of precision (Crosby, 1979; Garvin, 1983), service quality was considered difficult to define, measure, track and improve until the late 1980s (Zeithaml, Berry, and Parasuraman, 1988). Seminal work by Parasuraman et al. (1985; 1988) has contributed to the development of a widely adopted view of service quality that has helped address these challenges.

2.5.2.2 Dimensions of service quality – outcome vs. process

Since service is produced during the interaction between a customer and the elements in a service organization (Lehtinen and Lehtinen, 1982), service quality evaluations include assessment of the service outcome as well as the process of service delivery (Grönroos, 1984; Parasuraman et al., 1985). Satisfactory outcome is a prerequisite, but not sufficient for customer satisfaction (Swan and Combs, 1976).

Service quality literature uses many different terms to describe these two dimensions of service quality. For example, service outcome has been described as technical, instrumental or physical performance; whereas the process of service delivery has been referred to as psychological, expressive or interactive performance (Grönroos, 1984; Parasuraman et al., 1985; Swan and Combs, 1976). In essence, all of these terminologies differentiate core service benefit from the process of delivering that benefit and indicate that evaluations of service quality depend on both of these components.

2.5.2.3 Marketing vs. OM perspectives on service quality

Current literature examines service quality either from a marketing perspective or from an operations perspective (Garvin, 1984; Voss et al., 2004). The marketing perspective takes a customer-centric view and determines the service quality by the size of the gap between customer expectations for, and perceptions of, the service (Grönroos, 1984; Parasuraman et al., 1985, 1988). On the other hand, the operations perspective examines service quality in terms of the provider's ability to meet customer requirements reliably and consistently (Voss et al., 2004), and follows various research themes in operations management such as total quality management (TQM), service operations strategy (Roth and Jackson, 1995; Roth and Van der Velde, 1991), and service profit chain (Heskett, Jones, Loveman, Sasser, and Schlesinger, 1994). Since a provider's ability to meet customer requirements precedes the customers' satisfaction with a service, any measure of service quality must include an objective assessment of the provider's ability in addition to a measurement of the customer's expectation and perception of the service delivered.

2.5.2.4 Customer-centric view of service quality

The customer-centric view of service quality revolves around the customer's perception of the service. It defines perceived service quality as the customer's assessment of the overall excellence or superiority of the service (Zeithaml et al., 1988). Since perceived quality is the consumer's judgment about an entity's overall excellence or superiority (Zeithaml, 1987), it differs from objective quality (Garvin, 1983). Perceived service quality is also a judgment, related but not equivalent to satisfaction that results from the comparison of expectations

with performance (Bolton and Drew, 1991; Cronin and Taylor, 1992; Grönroos, 1984; Parasuraman et al., 1985).

A review of the current literature on service quality brings up two frameworks: the gap model, which is based on the disconfirmation paradigm, and the performance-based model, which is based on the perception of performance alone. Even though a few researchers have argued for the performance-based view (e.g. Cronin and Taylor, 1992, 1994), the disconfirmation paradigm based view has received wider support and acceptance in the academia and practice (Bolton and Drew, 1991; Carman, 1990; Parasuraman et al., 1985, 1988).

The disconfirmation paradigm holds that the predictions customers make in advance of the consumption act as a standard against which the customers measure the firm's performance (Bearden and Teel, 1983; Churchill and Surprenant, 1982; Parasuraman et al., 1985). The gap model suggests that disconfirmation results from five gaps: consumer expectation - management perception gap (gap 1), management perception - service quality specification gap (gap 2), service quality specifications - service delivery gap (gap 3), service delivery - external communications gap (gap 4), and expected service - perceived service gap (gap 5) which results from the first four gaps (Parasuraman et al., 1985). For example, SERVQUAL (Parasuraman et al., 1988), a multiple item scale developed based on this paradigm, proposes that customers rate service quality by comparing their expectations with performance on five underlying dimensions of a service - tangibles, reliability, responsiveness, assurance, and empathy. In addition, when one of the dimensions of quality is particularly important to customers, they may break that dimension into sub-dimensions (Carman, 1990).

Customer expectations are pre-trial beliefs about a product or service (Boulding et al., 1993; Olson and Dover, 1979). Service quality and consumer satisfaction literature differ in the way they use the term "expectations" (Tse and Wilton, 1988; Zeithaml, Berry, and Parasuraman, 1993). In the satisfaction literature, expectations are viewed as predictions made by consumers about what is likely to happen during a service encounter (Miller, 1977; Prakash, 1984; Swan and Trawick, 1980). In contrast, in the service quality literature, expectations are viewed as what the customers believe the service provider should offer (Parasuraman et al., 1985, 1988). Former type is termed "will" expectations and the latter is termed "should" expectations (Boulding et al., 1993; Tse and Wilton, 1988).

While both literatures link expectations and perceptions via the disconfirmation paradigm (Oliver, 1980), impact of these two types of expectations on perceived service quality is radically different (Boulding et al., 1993). While higher "should" expectations result in a lower perception of service encounter performance, higher "will" expectations result in a higher perception of the performance (Boulding et al., 1993).

Factors impacting expectations include firm-related factors and customer-related factors. Firm actions such as marketing activities including advertising and pricing (Grönroos, 1984) that are designed to deliver a particular message to the customer, explicitly try to influence these expectations. On the other hand, customer characteristics such as personal needs, past experiences with the firm, competition, and word-of-mouth communication have an implicit impact on customer expectations (Bolton and Drew, 1991; Boulding et al., 1993; Zeithaml et al., 1993). Moreover, societal variables such as traditions and ideology may also have an effect on a given customer's expectations (Grönroos, 1984).

As described above, customers may hold different 'will' and 'should' expectations. These expectations also differ in terms of how various factors impact them over time. While 'will'

expectations are assimilative, the ‘should’ expectations are much more stable and act as a standard of comparison in relation to the competition (Boulding et al., 1993). ‘Should’ expectations generally remain stable when perceived performance is below the existing level of should expectation, and go up when perceived performance is above the existing level of ‘should’ expectation or when competition improves service quality (Boulding et al., 1993). On the other hand, ‘will’ expectations go up or down based on previous service experience, word-of-mouth communications and information from expert sources (Boulding et al., 1993).

Higher levels of performance lead to higher evaluations, if expectations are held constant (Grönroos, 1984). However, as suggested by the assimilation/contrast theory, consumers may raise or lower their performance beliefs on the basis of how closely perceived performance approximates the expected performance (Cronin and Taylor, 1992). Therefore, perceptions and expectations can change over time (Boulding et al., 1993), resulting in a different level of perceived service quality even when the underlying service has not changed at all.

2.5.2.5 Firm-based view of service quality

Firm-based view of service quality is mostly found in the operations literature that examines service quality in terms of the provider’s ability to meet customer requirements reliably and consistently (Voss et al., 2004). This view considers service systems and service climate to be the primary drivers of a firm’s ability to deliver an excellent service time after time.

Service Systems: “Service System” is a frequently-used term in service operations management, services marketing, and NSD literatures. A service system is a configuration of technology and organizational network, including infrastructure, personnel, processes, and policies, designed to deliver services that meet the customer needs (Chase, 1981; Cook, Goh, and Chung, 1999; Lusch and Vargo, 2006). A service system consists of multiple, interdependent service processes (Johnston and Clark, 2001), and generally uses a hierarchically-organized process architecture (Smart, Maull, and Childe, 1999). The service concept defines the scope of “what” is delivered to the customers, whereas the service system addresses the question of how the service concept is delivered to the customers (Tax and Stuart, 1997). Many consider poor service quality a result of an inadequately designed or maintained service system (Berry, Parasuraman, Zeithaml, and Adsit, 1994; Lytle, Hom, and Mokwa, 1998) and argue that a properly configured service system that utilizes cutting-edge technology is at the core of an organization’s ability to reliably deliver quality service (Bowen, Siehl, and Schneider, 1989; Chase and Stewart, 1994; Heskett, Sasser, and Schlesinger, 1997; Jones, 1995; Lytle et al., 1998; Ponsignon, Smart, and Maull, 2011; Zeithaml et al., 1996). The competitiveness of a service firm partially depends on the design of a robust service system through which the service concept, and the value proposition that it seeks to offer to the customers, is created and delivered (Frei and Harker, 1999; Johnston and Clark, 2005; Ponsignon et al., 2011; Verma, Fitzsimmons, Heineke, and Davis, 2002). Proponents of a systems paradigm argue that a holistic approach for the design of a service delivery system that encompasses the entire set of activities necessary for delivering a service to the customer (including the activities performed in the presence of the customer as well as those that are performed in the absence of the customer) is vital to ensure that a firm is able to deliver excellent service to its customers (Ackoff, 1980; Ponsignon et al., 2011; Ponsignon, Smart, and Maull, forthcoming; Von Bertalanffy, 1968).

Service Climate: Climate for service refers to *“employee perceptions of the practices, procedures, and behaviours that get rewarded, supported, and expected with regard to*

delivering a quality service" (Schneider, Wheeler, and Cox, 1992 p. 705). The climate for service, in turn, yields behaviours that result in customer perceptions of service quality (Schneider and Bowen, 1985; Schneider, White, and Paul, 1998). This climate is created by the policies, practices and procedures that create the feel, predisposition or orientation of the organization (Deshpande, Farley, and Webster, 1993; Lytle et al., 1998; Schneider and Bowen, 1993; Schneider et al., 1992).

An organization's concern for its customers is reflected in the policies and practices adopted by the firm. When an organization has a set of beliefs that puts the customers' interest first, the organization is said to be "customer oriented" (Schneider et al., 1998). Researchers have also used the term "service orientation" to denote such organization-wide embracement of a basic set of relatively enduring organizational policies, practices and procedures intended to support and reward service-giving behaviours that create and deliver "service excellence" (Bowen et al., 1989; Kelley, 1992; Lytle et al., 1998; Schneider and Bowen, 1995; Schneider et al., 1992). Service orientation as an individual personality trait includes a disposition to be helpful, thoughtful, considerate, and cooperative (Hogan, Hogan, and Busch, 1984; McBride, Mendoza, and Carraher, 1993; Sanchez and Fraser, 1993). Given that service encounters, popularly described as "moments of truth" (Carlzon, 1987; Lytle et al., 1998), are basically employee interactions with the customers, how customers are treated by employees during the service encounter directly impacts their perceptions of service performance and their satisfaction with the service (Berry et al., 1994; Bitner, 1990, 1992; Bitner, Booms, and Tetreault, 1990; Lytle et al., 1998; Schneider et al., 1992). For example, when consumers in a national Gallup survey were asked what "quality in services" meant to them, one-third of all respondents cited employee contact skills such as courtesy, attitude or helpfulness (Benoy, 1996; Lytle et al., 1998). Therefore, hiring and training customer contact personnel that have the necessary skills and attitude to serve the customers, in addition to properly aligning incentives for these employees is considered crucial in realizing the desired service-centric attitude and behaviour from the employees (Benoy, 1996; Berry et al., 1994; Heskett, Sasser, and Hart, 1990; Lytle et al., 1998; Schlesinger and Heskett, 1991; Schneider and Bowen, 1993).

Customer Feedback: In addition, customers also play an important role in the development of service quality through a firm's systematic feedback and complaint-handling mechanisms (Voss et al., 2004). Such feedback and complaints impact organizational policies and processes apart from influencing employee attitudes that in turn impact service quality (Schneider et al., 1998).

Together, an organization's service system and service climate enable the firm to deliver a quality service and drive important organizational outcomes such as profit, growth, customer satisfaction, and loyalty (Henkoff, 1994; Heskett et al., 1997; Lytle et al., 1998; Schneider and Bowen, 1995).

2.5.2.6 Service quality and customer satisfaction

There is a fundamental distinction between service quality and customer satisfaction: judgment of service quality develops over an extended period of time and can be based on one or multiple service encounters, whereas customer satisfaction is a transitory judgment made on the basis of a specific service encounter (Bitner, 1990; Bolton and Drew, 1991; Boulding et al., 1993; Carman, 1990; Cronin and Taylor, 1994; Oliver, 1993; Parasuraman et al., 1988).

While there is a debate about whether service quality leads to customer satisfaction (Cronin and Taylor, 1992; Parasuraman et al., 1985, 1988) or whether the customer satisfaction leads

to service quality (e.g. Bitner, 1990; Bolton and Drew, 1991; Boulding et al., 1993), researchers seem to agree that together they have a significant impact on service loyalty and repurchase intentions (Harris, Grewal, Mohr, and Bernhardt, 2006).

2.5.3 Service failure

Service operations are usually complex, human-based systems involving the concurrent provision of many customer experiences and outcomes, with both employees and customers taking part in the process (Johnston and Clark, 2005). Consequently, mistakes and failures are inevitable in the delivery of services (Hart, Heskett, and Sasser Jr, 1990; Johnston and Michel, 2008). A service failure is any situation where something goes wrong, irrespective of responsibility (Magnini, Ford, Markowski, and Honeycutt, 2007; Palmer, Beggs, and Keown-McMullan, 2000). Service failures can result from fail points in the service delivery process (Miller, Craighead, and Karwan, 2000; Shostack, 1984). Ironically, quality conscious service companies may suffer the most, since their processes are likely to be streamlined to ensure consistent delivery time after time, and they therefore, may be completely ill-prepared to handle any exceptions (Hart et al., 1990).

The expectancy-disconfirmation theory posits that customers compare actual service performance levels with expected levels using a better-than and worse-than heuristic. Customers experience negative disconfirmation if the service performance is worse than expected, positive disconfirmation if the performance is better than expected, and simple confirmation if the performance is as expected (Oliver, Rust, and Varki, 1997). Similarly, taking the perspective of value accounting resulting from a service experience, studies invoking prospect theory (Kahneman and Tversky, 1979) and equity theory conceptualize service failure/recovery encounters as value exchanges in which the failure causes the customer to experience a value loss and the firm's recovery efforts contribute to a value gain (Zhu, Sivakumar, and Parasuraman, 2004). Since customers' value function is steeper for losses than for gains (Kahneman and Tversky, 1979; Thaler, 1985), losses are weighed more heavily than gains and require firms to provide value-added atonement instead of simply rectifying the failure.

While a variety of detailed typologies of service failures have been proposed (Bitner, Booms, and Mohr, 1994; Bitner et al., 1990; Kelley, Hoffman, and Davis, 1993), the categories of outcome (core service) failures and process (service delivery) failures suggested by Grönroos (1988) and Parasuraman et al. (1991; 1988) seem the most parsimonious way to classify these incidents. From a resource-exchange theory perspective, these outcome and process failures pertain to the problems that customers experience with utilitarian and symbolic exchanges, respectively (Smith, Bolton, and Wagner, 1999; Zhu et al., 2004).

2.5.4 Service Recovery

Service recovery involves the specific actions taken by the firm in response to a service failure (Grönroos, 1988; Spreng, 1995). When a firm fails to deliver a service as promised, the customers experience dissatisfaction with the service and the firm. Service failures have a negative effect on loyalty and are a driving factor in customer switching behaviour (Zhu et al., 2004). Through effective service recovery, a firm can attempt to minimize this negative effect and retain the customer.

Service failures and recovery strategies have generated a lot of interest among service researchers (e.g. Grönroos, 1988; McCollough, Berry, and Yadav, 2000; Tax and Brown, 1998) and practitioners (Brady, 2000; Metz, 2000; Zhu et al., 2004), especially in the last two decades. The vast majority of this literature currently takes a marketing view of recovery, primarily concerned with the impact of service failure & recovery on customer satisfaction. Thus, the focus of service recovery is often defined in terms of raising a dissatisfied customer's satisfaction level (e.g. Andreassen, 2001; Berry and Parasuraman, 1991; Boshoff, 1997). For example, Boshoff (1997) suggested that according to the service quality literature, the outcomes of service recovery are improved customer satisfaction and improved service quality perceptions leading to positive behavioural intentions such as repeat purchases and loyalty (Johnston and Michel, 2008). As discussed below, these studies identify key elements associated with an effective service recovery including drivers of customers' expectations and evaluations of service recovery, outcome measures related to customer satisfaction and dissatisfaction, types of failures and recoveries, and service recovery frameworks (Miller et al., 2000). While the ability to achieve effective recovery from the failures is an Operations' responsibility (Miller et al., 2000; Roth and Menor, 2003), not many studies explore service recovery from a service firm's perspective (Johnston and Michel, 2008; Zhu et al., 2004).

2.5.4.1 Importance of service recovery

A service failure results in customer dissatisfaction with the service and / or the firm. When customers are dissatisfied, they may choose one of the two mechanisms to voice their dissatisfaction as suggested by Hirschman's (1970) exit-voice theory: exit or voice. In Hirschman's terms, exit is essentially an escape from an objectionable state of affairs and voice is an attempt to accomplish a change (Fornell and Wernerfelt, 1987).

It has been shown that those who complain are generally the more loyal customers of a firm, and if their complaints are not properly handled, they may quickly become disloyal (Clark, Kaminski, and Rink, 1992; Magnini et al., 2007; Miller et al., 2000; Tax and Brown, 1998). It is possible that a negative result in recovery is magnified by the virtue of it being the second time that the firm has failed - i.e. once in the original failure and now in the recovery attempt (Bitner, 1990; Spreng, 1995). Preventing customer defection should be a priority for most companies since attracting a new customer can cost as much as five times the cost of retaining the original customer (Jacob, 1994; Peters, 1988; Swanson and Kelley, 2001). In addition, since word-of-mouth (WoM) regarding problem resolution can be a major positive or negative force in building a firm's reputation and retaining customers (Boulding et al., 1993; Parasuraman et al., 1991; Parasuraman et al., 1988; Reichheld and Sasser Jr, 1990), the rewards to companies which resolve problems to the customer's satisfaction appear to be very high (Hart et al., 1990; Spreng, 1995).

Apart from reducing the customer churn, a service recovery also allows the firms to discover any underlying reasons that generate errors in the first place (Simons and Kraus, 2005). Therefore, even though service recovery procedures can be expensive, firms should view them as opportunities to make improvements and not simply as a cost (Spreng, 1995). If done well, service recovery strengthens customer loyalty, corrects weak links in the processes, and improves profitability. If done poorly, recovery efforts can irreparably damage customer relationships, contribute to employee dissatisfaction, and devastate profitability (Brown, 1997). In fact, Hart et al. (1990) argue that service recovery is fundamental to service excellence, and should therefore be regarded as an integral part of a service company's strategy.

2.5.4.2 Factors affecting customer expectations of service recovery

Customers' expectations for service recovery are moderated by many factors such as the perceived service quality (Miller et al., 2000), seriousness of the failure (Hoffman, 1995; Kelley and Davis, 1994; Spreng, 1995), the degree of customer organizational commitment (Kelley and Davis, 1994; Miller et al., 2000), and any explicit service guarantee given by the firm (Halstead, Dröge, and Cooper, 1993; Hart, 1988).

Some researchers argue that a customers' previous interaction history with the firm may provide a "satisfaction buffer" that may reduce the impact of a failure that occurs after the customer has had a history of successful service deliveries in the past. Studies grounded in belief-updating theory (Hogarth and Einhorn, 1992) for longitudinal relationships suggest that customers update their beliefs about the future value of a relationship by digesting new, sequential information from service deviations (i.e., service failures) and recoveries (Bolton, 1998). Since a person's satisfaction judgment is a cumulative evaluation of all experiences with the firm (Cronin and Taylor, 1994), it reflects the cumulative interactions over time between the individual and that firm (Bitner et al., 1994; Magnini et al., 2007). A failure happening early in the customer's relationship with the firm will weigh more heavily on customer dissatisfaction because the customer has had fewer successful service experiences to counterbalance the failure (Ganesan, 1994; Magnini et al., 2007; Maxham, 2001). As the customer builds more confidence in a provider's abilities, he may weigh prior assessments of services more heavily and place less weight on new information (Hess Jr, Ganesan, and Klein, 2003; Magnini et al., 2007; Tax and Brown, 1998).

In addition, perceived stability (whether the cause is likely to recur), locus (attribution of responsibility), and controllability (whether the firm had control over the cause) can also have a significant impact on the customer's reaction to a service failure (Bitner, 1990; Folkes, 1988; Magnini et al., 2007; Maxham, 2001; Swanson and Kelley, 2001). Stability is the extent to which a cause is viewed as temporary (expected to vary over time and therefore, unpredictable) or permanent (expected to persist over time and therefore, predictable) (Folkes, 1988; Hess Jr et al., 2003; Magnini et al., 2007). This stability of a cause determines shifts in expectancies (Weiner, 1985, 1992) resulting in customers reacting more strongly when they believe that the cause of a failure was predictable, and therefore, the failure is likely to occur again. The locus of causality has its roots in the attribution theory (Kelley, 1967) that examines the assignment of causal inferences and how these interpretations influence evaluations and behaviour. Faced with a service failure, customers may attribute the cause of a failure to themselves (internal) or to the firm (external). Weiner (1992) classified this internal-external distinction in the attribution as the locus of causality dimension. When the locus is external, customers are not as forgiving of the failure as they are when the locus is internal (Oliver and DeSarbo, 1988; Swanson and Kelley, 2001). Attributions such as stability of the cause, locus and controllability also influence consumer communication with the firm post failure, preferred recovery (Folkes, 1988), satisfaction with the service encounter and recovery (Oliver and DeSarbo, 1988), and future repurchase intentions (Swanson and Kelley, 2001).

Culture also plays a role in the evaluation of service encounters because customer behaviour is affected by the environment including national culture (Roth and Jackson, 1995; Voss et al., 2004). While customers with different cultural or national background may be equally responsive to good service, they may differ when it comes to reacting to poor service. In a study that compared the U.S. customers with the U.K. customers, Voss et al. (2004) found the U.K. customers to be more tolerant of poor service. They argue that "*much valuable customer*

feedback may be unrealized in Britain, thus losing the opportunity to improve service design and delivery and creating a vicious cycle" (Voss et al., 2004 p. 212). Therefore, cultural norms may also moderate customers' reaction to service failure, and expectations for service recovery.

2.5.4.3 Service recovery frameworks

An organization's service recovery procedures may lead to three distinct outcomes; customer, process, and employee recoveries (Johnston and Michel, 2008).

2.5.4.3.1 Customer Recovery

Customer recovery has been the most widely studied topic in the service recovery literature, and therefore there are a lot of prescriptive ideas in the literature regarding the steps companies should follow to recover the customer from a service failure. Johnston et al. (2008) neatly sum up these ideas by suggesting that recovering the customer involves following key activities – acknowledgement (Bitner, 1990), empathy (Bell and Ridge, 1992; Johnston and Fern, 1999), apology (Kelley et al., 1993; Miller et al., 2000), taking ownership of the problem (Barlow and Moller, 1996), fixing the problem (Michel, 2004), assuring the customer (Barlow and Moller, 1996), and providing compensation (Boshoff, 1997) or other value-added atonement (Bell and Ridge, 1992; Clark et al., 1992). Companies need to use IT to proactively sense the need for service recovery, to track the progress of service recovery efforts in real time, and also to collect and analyse the data on service recovery opportunities and outcomes (Brown, 1997; Fornell and Westbrook, 1984; Tax and Brown, 1998).

To aid effective service recovery, companies should anticipate the need for a recovery, train and empower the employees, break customer silence and listen closely for complaints, ask open ended questions, provide a choice of channels for the customer to raise a complaint or provide feedback, take responsibility, act fast, and close the customer feedback loop - i.e. tell the customer what company did with the complaint (Hart et al., 1990; Sampson, 1999; Tax and Brown, 1998). Along similar lines, Magnini et al. (2004) suggest that the companies should adopt a LEARN process (listen, empathize, apologize, react, notify) since the use of such systematic procedures for capturing customer feedback and complaints has been found to have a direct and positive influence on the level of customer satisfaction (Voss et al., 2004).

Similar to the relationship between service quality and customer satisfaction (Mittal, Ross, and Baldasare, 1998; Voss et al., 2004), the relationship between the level of service recovery and perceived service-quality improvement is non-linear and diminishing (Smith et al., 1999). Therefore, firms need to find an optimal level of service recovery for each possible service failure scenario (Zhu et al., 2004) to maximize the return on such efforts.

2.5.4.3.2 Process Recovery

Apart from highlighting the role played by customer feedback in the initiation of service recovery efforts, a growing service management literature also emphasizes a second role of customer feedback, namely, in product and service design and in operations learning (Berry and Parasuraman, 1997; Johnston and Michel, 2008; Meyer and DeTore, 1999; Miller et al., 2000). Voss et al. (2004) argue that "*Services are characterized by rapid change, ease of*

copying, and continually rising customer expectations. Because customer feedback enhances product and process improvement, service firms whose procedures effectively capture feedback should be able to improve their service quality faster than those that do not” (p. 216). Tracking and analysing service failures and service recovery strategies provide the firm with a view to not only what works in recovery, but also why service failures happen in the first place (Hoffman, 1995). Customer feedback can also be used to improve existing services and to come up with new services (Voss et al., 2004).

Learning from failures moves service recovery away from a transactional activity concerned only with recovering and satisfying an individual customer, and closer to a management activity that improves systems and processes to ensure that future customers are satisfied and costs are reduced (Johnston and Michel, 2008). Process improvements that influence customer satisfaction represent the most significant means of creating a bottom-line impact through recovery (Hart et al., 1990; Johnston and Clark, 2005; Reichheld and Sasser Jr, 1990; Schlesinger and Heskett, 1991). The process improvement steps include data collection, classification of service failure, identification & dissemination of organizational learning, costing, and improvement (Johnston and Clark, 2005; Tax and Brown, 1998). Even though the importance and impact of process improvements are widely acknowledged (Barlow and Moller, 1996; Hart et al., 1990; Johnston and Clark, 2005; Tax and Brown, 1998; Tax, Brown, and Chandrashekaran, 1998), the topic is little developed (Simons and Kraus, 2005).

2.5.4.3.3 Employee Recovery

Since most services require customers to interact with the front-line staff, the role of such customer-contact personnel during service recovery is expected to be a key factor in determining overall customer satisfaction (Martin and Horne, 1993; Spreng, 1995) post service failure.

The ‘front-line’ employees should be trained to both discover and handle service failures (Bowen and Lawler, 1992, 1995; Spreng, 1995). As locus, stability and perceived firm control over the cause of the failure play a significant role in determining a customer’s reaction to service failures, service employees must also focus on providing customers with adequate and plausible explanations when failures do occur (Magnini et al., 2007). Previous research suggests that recoveries enacted by frontline personnel may be evaluated more favourably than recoveries attributed to the organization or its higher-level representatives (Hart et al., 1990; Kelley et al., 1993; Swanson and Kelley, 2001). Therefore, employees should be empowered – i.e. be given the power to “fix” the problem (Bowen and Lawler, 1992; Hart et al., 1990; Miller et al., 2000) in case of service failures.

Much of the employee literature associated with recovery has been concerned with the role of the employees in the context of service failure, such as their ability to adapt (Boshoff and Leong, 1998), the need for them to be proactive (Iacobucci, 1998), and the role of self-managing teams (de Jong and de Ruyter, 2004). However, some researchers have also recognized the impact service failure and recovery can have on employees. Since poor recovery processes can be the cause of much stress for employees (Bowen and Johnston, 1999; Johnston and Michel, 2008), firms need to focus on “employee recovery” (Bowen and Johnston, 1999) in addition to focusing on customer and process recovery. Most of the organizations studied by Bowen et al. (1999) were aware of the concept of customer recovery, but had a limited notion of the need to “recover” employees - i.e. supporting their employees in their difficult role of dealing with the complaining customers. According to Johnston et al.

(2005 p. 398), “when employees are left on their own to soak up the pressure resulting from inadequate service systems, it leads not only to dissatisfied and disillusioned customers, but also to stressed and negatively disposed staff who feel powerless to help or sort out the problems”. This helpless feeling induces employees to display passive, maladaptive behaviours, such as being unhelpful, withdrawing or acting uncreatively (Johnston and Michel, 2008). This alienation directly impacts the customers, especially the complaining or the aggrieved ones (Johnston and Michel, 2008).

2.5.4.4 Evaluation of service recovery outcomes

To some degree, overall customer satisfaction in a service failure situation is determined by two factors: the outcome of the original service encounter based on specific service attributes (Singh, 1991), and attributes associated with the service recovery process (Parasuraman et al., 1991). Although both dimension types, outcome and process, occur in both the original service encounter and the service recovery episode, outcome is the primary driver of consumer evaluations of service during the initial service encounter, while process is the primary driver during the service recovery episode (Berry and Parasuraman, 1991). In addition, interactional treatment may also impact the evaluation of service recovery for high involvement services (Tax and Brown, 1998).

Many studies have compared the relative efficiency and efficacy of outcome versus process recovery strategies (e.g. Webster and Sundaram, 1998) and complementary effects of the two types (e.g. Miller et al., 2000; Tax et al., 1998), and examined whether it is more efficient to recover a particular type of failure with the same type of recovery or with a different type. Zhu et al. (2004) show that this depends on the individual customer characteristics including sensitivity to each type of failure.

2.5.4.5 The service recovery paradox

Many researchers have shown that a successful recovery can result in a more favourable encounter than if the transaction had been performed correctly the first time (Hart et al., 1990; Swanson and Kelley, 2001). Termed the “service recovery paradox” by McCollough et al. (1992), this phenomenon states that the occurrence of a failure may, if the recovery is highly effective, offer an opportunity to acquire higher satisfaction ratings from customers than if the failure had never happened. The recovery paradox theory is supported by the expectancy disconfirmation theory, script theory, and commitment-trust theory (Magnini et al., 2007).

According to the disconfirmation paradigm, customer satisfaction is the consequence of an evaluation process in which the customer compares his or her expectations of how the service should be performed against the actual service experience (Oliver, 1993). Customer expectations are defined as internal standards or benchmarks against which customers judge or measure the quality of service they receive (McDougall and Levesque, 1998). Expectations are determined by many factors including advertising messages, prior experience, personal needs, word of mouth (Parasuraman et al., 1985), image of the service provider (Grönroos, 1984), and promises made by the service provider (Zeithaml et al., 1993). When an actual outcome exceeds a customer’s expected outcome, positive disconfirmation results (Oliver, 1980). Conversely, when expectations are not met, customers experience negative disconfirmation (Bearden and Teel, 1983; Harris et al., 2006). The service recovery literature shows that this disconfirmation model is appropriate in recovery situations as well (Boshoff,

1997; Harris et al., 2006). Accordingly, when a customer is the recipient of an excellent recovery, this causes positive disconfirmation of expectations that results in a heightened post-satisfaction state (Oliver, 1997). Positive disconfirmation is only achieved after a first-rate recovery because most customers realize that a service transaction entails some potential for dissatisfaction (Murray and Schlacter, 1990), and, therefore, they expect some form of redress following a failure (Berry and Parasuraman, 1991). Therefore, a mediocre recovery strategy only spurs confirmation of the customer's expectations and no paradoxical satisfaction increase is experienced (Magnini et al., 2007).

Script theory posits that the knowledge about familiar, frequent situations is stored in one's mind as a coherent description of events expected to occur (Bateson, Czepiel, Solomon, and Surprenant, 1985; Gan, 1991). This means that the customers and employees in routine, well-understood service encounters may share similar beliefs regarding their roles and the expected sequence of events and behaviours (Bitner et al., 1994). Service failures heighten the sensitivity and awareness of the customer due to the deviation from an anticipated transactional script. Therefore, service recovery efforts are usually very salient in the consumers' mind because of the heightened attention and evaluation resulting from a service failure (Magnini et al., 2007; Spreng, 1995). Therefore, the process of problem resolution can be more important than the initial service attributes in influencing overall customer satisfaction and repurchase intentions (Bitner, 1990; Hart et al., 1990).

Commitment-trust theory (Morgan and Hunt, 1994) posits that a superb service recovery has a direct impact on the trust that the customer has in the firm (Kelley and Davis, 1994; Tax et al., 1998). As it is common knowledge that service failures are inevitable; service firms can build trust through effective service recovery as it shows the customers that the firm has the honesty and integrity to amend its own errors (Magnini et al., 2007).

While a number of studies have provided evidence in support of the recovery paradox (Smith and Bolton, 1998; Spreng, 1995; Tax and Brown, 1998), several studies have failed to find such support (Andreassen, 2001; Maxham, 2001; McCollough et al., 2000; McCollough and Bharadwaj, 1992). In a meta-analysis of the studies that examine the service recovery paradox, de Matos et al. (2007) found that while service recovery paradox impacted satisfaction, its impact on customer loyalty and word-of-mouth was non-significant. Recent research shows that the paradox is actually moderated by a number of contextual factors such as severity of the failure, previous failures experienced by the same customer, stability of the cause of the failure, and perceived control of the firm over cause of the failure (Magnini et al., 2007). This may explain the inability of some studies to find support for the paradox given that these moderating factors were not taken into account.

2.6 Summary

Previous sections examined NSD, Service Quality, and Service Recovery literatures in order to uncover considerations that are useful in exploring the role of Unsolicited Customer Input in the context of NSD and service innovation. Following insights emerge.

While still contested by a few (Campbell and Cooper, 1999; Ives and Olson, 1984; Magnusson et al., 2003), customer involvement in NSD is considered by most researchers to be not only useful, but also vital for the success of NSD process (de Brentani, 1991; Matthing et al., 2006; von Hippel and Katz, 2002). Customer involvement is considered especially important during the initial and final stages of the NSD process which correspond to idea generation and service

launch (Alam and Perry, 2002; von Hippel, 1986). Research on various NSD process models have evolved from linear models (i.e. the 1st generation models) that consider NSD to be a linear sequence of activities starting with idea generation and ending with launch (Bowers, 1989; Johnson et al., 2000), to the dynamic cyclic innovation models (i.e. the 4th generation models) which stress existence of feedback paths across various NSD process stages and argue that innovation takes place in a non-sequential manner (Baker and Sinkula, 1999; Hart and Baker, 1994; Stevens and Dimitriadis, 2005). While the middle stages of the process show a very different sequence and interconnectedness among these models, the beginning and the end of the process are depicted more or less in an identical fashion across the models. Being the first stage in the process, the ideation or the conceptualization stage is a necessary starting point for the ultimate success of the process.

While both types of customer inputs – solicited as well as unsolicited can be a source of ideas for the NSD process, there are important differences between the two that impact how a firm can go about utilizing each type of input in the NSD process. Since solicited customer feedback is obtained through customer contact that a firm initiates, a firm can carefully decide the types of customers to engage (Gruner and Homburg, 2000; Lettl et al., 2006; von Hippel, 1986), the level of involvement sought, the stages of the innovation process in which the customers can get involved (e.g. Callon, 1999; Christensen, 1997; Cooper, 2001; Leonard-Barton, 1995; Nambisan, 2002; Rothwell et al., 1974; von Hippel, 1988), what is asked from the customers, and where & how the interaction takes place (Deszca et al., 1999; Leonard and Rayport, 1997; Martin and Horne, 1995; Matthing et al., 2004; Prahalad and Ramaswamy, 2000). On the other hand, Unsolicited Customer Input is received only when a customer initiates the contact. Therefore, a firm has very little control over who provides the input, when they provide the input, and what the input relates to.

In addition, while the Solicited Customer Input is generally requested by those who are involved in NSD activities, the Unsolicited Customer Input is generally received by others and not by those who are formally involved in NSD. Such Unsolicited Customer Input can be a result of a customer experiencing delight or outrage (Rust and Oliver, 2000, Schneider and Bowen, 1999, Voss et al., 2004) following an excellent service experience or a service failure with the later more likely to be the case than the former. A review of service quality and service recovery literatures suggests that most firms primarily focus on recovering the customer following a service failure and miss out on the opportunity to improve quality of existing services as well as to come up with new services based on the feedback (Barlow and Moller, 1996; Hart et al., 1990; Johnston and Clark, 2005; Simons and Kraus, 2005; Tax and Brown, 1998; Tax et al., 1998).

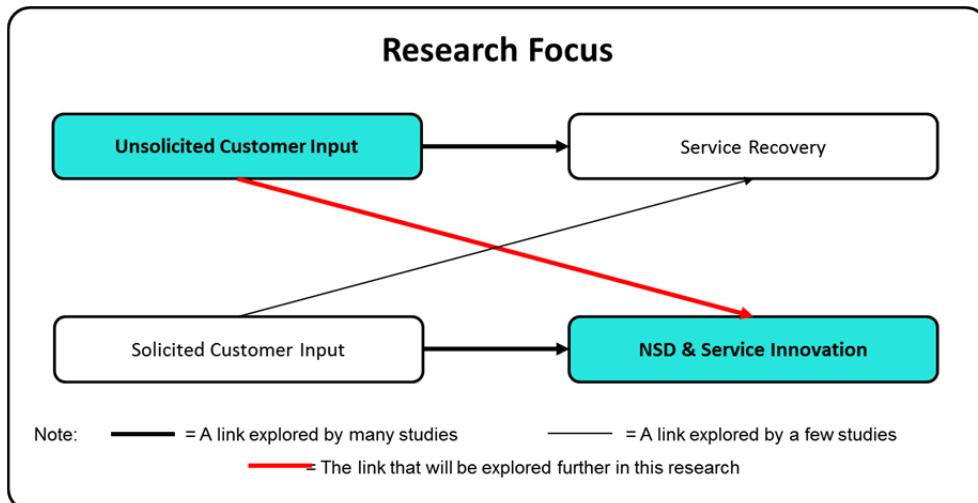
The structural disconnect between those who receive the unsolicited input and those who need to utilize the insights from this input to come up with new services and the additional challenges posed by lack of control firm has over when, where, how, and who provides such input, make it difficult for the firm to leverage Unsolicited Customer Input as a source of ideas for service innovation. While current literature carefully examines the role that the Solicited Customer Input can play in the NSD process, there is a lack of research that examines identical issues for the role of Unsolicited Customer Input in the NSD process. While researchers have argued since long that customer complaints and feedback can be a source of ideas for new products and services (Fornell, 1976; Goodman, 1999; Voss et al., 2004), current literature lacks adequate research on the role played by such Unsolicited Customer Input in NSD (Shulver, 2005).

This is an important area to investigate as it is widely recognized that our knowledge of service innovation is fragmented and limited compared to our knowledge of product and technology innovation (Avlonitis, Papastathopoulou, and Gounaris, 2001; de Brentani, 1991, 2001; Gallouj and Weinstein, 1997; Menor et al., 2002; Sundbo, 1997). Many researchers consider the lack of understanding of how to involve customers in the development process as one of the major reasons behind why NSD has proven to be a difficult task (de Brentani and Ragot, 1996; Johne and Storey, 1998). Therefore, a significant contribution to the NSD and service innovation literature can be made by exploring the role such Unsolicited Customer Input can play as a source of ideas in the context of NSD and service innovation.

Figure 2.1 summarizes the contexts in which the extant literature has investigated Unsolicited and Solicited Customer Inputs, and highlights an area that has not been explored adequately yet, which this dissertation will focus on.

Next chapter proposes a theoretical framework that builds on the existing research from NSD, service quality, and service recovery literature streams in order to develop a better understanding of how the firms can leverage the Unsolicited Customer Input in the context of NSD, what factors impact a firm's ability to do so, and what impact such use (of Unsolicited Customer Input in NSD) has on the NSD outcomes such as NSD Speed, NSD Success, and the Type of innovation pursued by the firm.

Figure 2.1 Literature on Customer Input



Chapter 3. How does Unsolicited Customer Input drive Service Innovation? An exploratory study

3.1 Introduction

Service firms across the world are increasingly facing a very dynamic environment characterized by rapid change and heightened levels of competition (Bitner et al., 2000; de Brentani, 1995). The service industries that used to enjoy a protected territory are now witnessing an increased level of deregulation (Alam and Perry, 2002). With this rapid pace of change in service industries across the continents, service innovation has become a strategic imperative for the service firms (Alam, 2006b; Zomerdijk and Voss, 2011). Keeping in line with the increasing importance of service innovation, a body of literature that examines New Service Development (NSD) has started to emerge (Froehle and Roth, 2007; Froehle et al., 2000; Johne and Storey, 1998; Menor et al., 2002; Silvestro, Fitzgerald, Johnston, and Voss, 1992). These studies have established the importance of involving customers in the innovation process (Alam, 2006a; Sundbo, 1997), emphasized the importance of the early stages of NSD including idea generation and the role of customers in a service innovation process (e.g. Alam, 2002, 2006a; Alam and Perry, 2002), and suggested that customer interaction in NSD has a positive effect on new service performance (e.g. Alam, 2006a; de Brentani, 1991, 1995; de Brentani and Cooper, 1992; Edgett, 1994).

The customer interaction and the resulting input can be divided into two distinct categories – the Solicited Customer Input that is received when the firm initiates the interaction with the customer, and the Unsolicited Customer Input that is received when the customer initiates the interaction. Numerous studies have examined or argued for the utilization of Solicited Customer Input in NSD (e.g. Alam, 2002, 2006a; Alam and Perry, 2002; Magnusson et al., 2003; Martin, 1996; Matthing et al., 2006; Melton and Hartline, 2010). Some have even come up with a prescriptive list of activities that the firm should involve the customers in (e.g. Alam and Perry, 2002). However, the role of Unsolicited Customer Input in the context of service innovation has received very little attention from the OM scholars so far, except for the literature on service recovery that looks at certain aspects of improvements to the existing services by learning from service failures (e.g. Johnston and Michel, 2008; Miller et al., 2000; Roth and Menor, 2003; Zhu et al., 2004).

Developing an understanding of how firms can leverage Unsolicited Customer Input as a source of ideas for service innovation is the first step towards determining when such use can result in greater NSD success. However, unlike solicited input, the unsolicited input is generally more diverse (ranging from extremely positive or negative views on existing services to ideas about new services that the customer wants the firm to provide), comes through a variety of channels, is received over the entire lifecycle of the service, and the firm has little control over the associated frequency, content, and level of abstraction. Therefore, the literature that looks at the role of Solicited Customer Input in NSD cannot provide many answers when it comes to understanding the role of Unsolicited Customer Input in NSD. As a result, our knowledge of the role that the Unsolicited Customer Input can play in driving service innovation and NSD within a firm is rather limited.

To address this gap, this research examines the role of Unsolicited Customer Input as a driver of service innovation, in an empirical setting. It specifically seeks to answer the following three research questions: (1) How do firms leverage Unsolicited Customer Input as a source of ideas for Service Innovation? (2) What are the factors that impact a firm's ability to do so? (3) What impact does the use of Unsolicited Customer Input in NSD have on the NSD outcomes such as

NSD Speed, NSD Success, and Type of innovation pursued? It sets out to uncover the process that allows the organizations to leverage the Unsolicited Customer Input in the NSD process, identify the factors that impact the process, and assess the impact of using Unsolicited Customer Input in the NSD process on the success of the new services. Based on the case studies of 8 service firms, this study also sets out to identify the practices employed by the service firms that are able to utilize the Unsolicited Customer Input in NSD.

It is widely recognized that our knowledge of service innovation is fragmented and limited compared to our knowledge of product and technology innovation (Avlonitis et al., 2001; Cooper and de Brentani, 1991; de Brentani, 2001; Gallouj and Weinstein, 1997; Menor et al., 2002; Sundbo, 1997). Many researchers consider the lack of understanding around how to involve customers in the development process as one of the major reasons behind why New Service Development has proven to be a difficult task (de Brentani and Ragot, 1996; Johne and Storey, 1998). By exploring the role of Unsolicited Customer Input as a source of ideas for innovation, this research not only advances the knowledge of customer involvement in NSD, but also of the wider area of service innovation and NSD.

The rest of this chapter is organized as follows. We first review current literature on NSD and the role of customers in the NSD process, and propose an initial framework and associated propositions. Next, the research methodology is described including the process followed for sample selection, data collection, and data analysis. The findings are presented next and they lead to a revised framework along with a modified set of propositions that cover the common firm practices associated with the use of Unsolicited Customer Input in NSD and the factors that affect such use. Finally, the chapter ends with a discussion and conclusion derived from the results.

3.2 Theoretical Background

For developed and developing countries alike, services have become a major contributor to the GDP, employment growth, productivity, and innovation (Spohrer and Maglio, 2008). Corresponding with the increased importance of services across the world given the ever-evolving nature of markets and the progress in science and technology that increases the pace of change in products as well as service industries (Fitzsimmons and Fitzsimmons, 2001; Johnson et al., 2000), service innovation has become critically important for businesses as well (Batista et al., 2008; Chiu and Lin, 2004). This has led to the emergence of NSD process & service innovation as one of the most important and active areas of research (Flint, 2002; Slater and Narver, 1995).

Service innovation is the goal of new service development, and refers to making changes in the existing services, or coming up with entirely new services. New service development (NSD) refers to the overall process through which service innovations are pursued and new services are developed (Johnson et al., 2000). The NSD process can be defined as "*the set of activities, actions, tasks, and evaluations that move an NSD project from the idea stage to launch*" (Cooper et al., 1994, p. 283). Typical stages are idea generation and concept development, analysis, detailed design, and launch (Froehle and Roth, 2007; Johnson et al., 2000; Khurana and Rosenthal, 1997; Menor et al., 2002). Understanding customer needs is a vital part of any NSD process (Batista et al., 2008; Edvardsson and Olsson, 1996; Stevens and Dimitriadis, 2005). It has been argued that business success depends on an organization's ability to imagine and /or create a need (Pilzer, 1990). The process of innovation starts when an organization senses such an opportunity. Therefore, the sources of innovation and the process through which the

firms obtain ideas for innovation from these sources are vital parts of the service innovation process.

Because of the centrality and frequency of their interactions, customers are one of the most important and useful sources of information for the firms (Kandampully, 2002; Voss et al., 2004). Existing research identifies many different customer roles for value creation in a service setting - ranging from being a resource or co-producer to a user (Finch, 1999; Gersuny and Rosengren, 1973; Kaulio, 1998; Lengnick-Hall, 1996; Nambisan, 2002). Customers contribute to the innovation cycle by generating consumer demand (Gupta and Mirjana, 2000; Vargo and Lusch, 2004) and by being a source of ideas (Von Hippel, 2001; Von Hippel et al., 2002) apart from driving the final success as the sole judge of the service innovations introduced by the firms. Therefore, many scholars believe the collaboration with customers to be a valuable way to achieve both innovation and economic success (Biemans, 1992; Gales and Mansour-Cole, 1995; Gemunden et al., 1992; Håkansson and Snehota, 1995). While still contested by a few (Campbell and Cooper, 1999; Ives and Olson, 1984; Magnusson et al., 2003), customer involvement in NSD is considered by most researchers to be not only useful, but also vital for the success of an NSD process (de Brentani, 1991; Matthing et al., 2006; von Hippel and Katz, 2002). Customer involvement is considered especially important during the initial and final stages of the NSD process which correspond to idea generation and service launch (Alam and Perry, 2002; von Hippel, 1986). Customer involvement may lead to new product ideas, enhanced product development effectiveness, and even reduced time to market for new products (e.g. Alam and Perry, 2002; Campbell and Cooper, 1999). As technology-based service provision replaces face-to-face service encounters, companies risk losing touch with their customers, and thereby an important source of information for their NSD process, making customer involvement in NSD even more crucial than before (Curran et al., 2003; Grönroos, 2000; Matthing et al., 2006). Intensified interaction with customers can help companies overcome this loss and help improve the effectiveness of NSD process (Alam and Perry, 2002; Magnusson et al., 2003; Olson and Bakke, 2001; Thomke, 2003). However, a lack of understanding of how to involve customers in the development process is seen by many as one of the reasons why service Innovation has remained an elusive task (de Brentani and Ragot, 1996; Johne and Storey, 1998).

Customer involvement in service innovation is defined as "*those processes, deeds and interactions where a service provider collaborates with current (or potential) customers at the program and/or project level of service development, to anticipate customers' latent needs and develop new services accordingly*" (Matthing et al., 2004, p. 487). Recent research on service-centred model (e.g. Langeard et al., 1986; Normann, 1984; Vargo and Lusch, 2004) suggests that customer involvement plays a more important role in service firms than it does in tangible product firms. Service-centred dominant logic implies that "*value is defined by and co-created with the consumer rather than embedded in the output*" (Vargo and Lusch, 2004, p. 6). This requires that firms move from a "*make-and-sell*" strategy to a "*sense-and-respond*" strategy (Haeckel, 1999), where sensing refers to sensing the customer needs and requirements. Involving customers in NSD activities may allow the firm to learn directly from the customers about their requirements and needs, reduce the gap between such needs and the firm's understanding of these needs, and positively affect new service performance (e.g. Alam, 2006a; de Brentani, 1991, 1995; de Brentani and Cooper, 1992; Edgett, 1994).

Customer input can be divided into two categories based on the locus of initiative: solicited - when the firm initiates the contact, and unsolicited – when the customer initiates the contact (Brockhoff, 2003). Sampson (1996; 1999) describes these two types of customer feedback as "*actively collected customer feedback*" and "*passively collected customer feedback*" based on

whether the firm or the customer initiates the contact that conveys the customer feedback to the firm. While both types of customer input (solicited as well as unsolicited) can be a source of ideas for the NSD process, there are important differences between the two that impact how a firm can go about utilizing each type of input in the NSD process. Since solicited customer feedback is obtained through customer contact that is initiated by a firm, the firm can carefully decide on the types of customers to engage (Gruner and Homburg, 2000; Lettl et al., 2006; von Hippel, 1986), the level of involvement sought, the stages of the innovation process in which the customers get involved (e.g. Callon, 1999; Christensen, 1997; Cooper, 2001; Leonard-Barton, 1995; Nambisan, 2002; Rothwell et al., 1974; von Hippel, 1988), what is asked from the customers, and where & how the interaction takes place (Deszca et al., 1999; Leonard and Rayport, 1997; Martin and Horne, 1995; Matthing et al., 2004; Prahalad and Ramaswamy, 2000; Sampson, 1999). On the other hand, unsolicited / passively collected customer input is received only when a customer initiates the contact. Therefore, the firm has very little control over who provides the input, when they provide the input, and what the input relates to (Sampson, 1996; Sampson, 1999).

The Unsolicited Customer Input can be a result of a customer experiencing delight or outrage (Rust and Oliver, 2000, Schneider and Bowen, 1999, Voss et al., 2004) following an excellent service experience or a service failure (Johnston and Michel, 2008; Sampson, 1996; Sampson, 1999) with the later more likely to be the case than the former. The two profoundly positive or negative affective states of delight and outrage result only when customer expectations are exceeded or unsatisfied by a surprising degree (Rust and Oliver, 2000, Schneider and Bowen, 1999, Voss et al., 2004). Delight is associated with a positive disconfirmation of emotions and cannot be achieved without surprisingly positive levels of performance (Rust and Oliver 2000). On the other hand, outrage is associated with a higher degree of emotionality (Schneider and Bowen, 1999) and results when a customer experiences extreme dissatisfaction with the service. Dissatisfaction is also described as a state of cognitive/ affective discomfort caused by an insufficient return relative to the resources spent by the consumer at any stage of the purchase/consumption process (Fornell and Wernerfelt, 1987). Dissatisfied customers can complain, become irate, and even turn into activists.

Service operations are usually complex, human-based systems involving the concurrent provision of many customer experiences and outcomes, with both employees and customers taking part in the process (Johnston and Clark, 2005). Consequently, mistakes and failures are inevitable in the delivery of services (Hart et al., 1990; Johnston and Michel, 2008). A service failure is a situation where something goes wrong, irrespective of responsibility (Magnini et al., 2007; Palmer et al., 2000). A review of service quality and service recovery literatures suggests that most firms primarily focus on recovering the customer following a service failure and miss out on the opportunity to improve quality of existing services as well as come up with new services based on the feedback (Barlow and Moller, 1996; Hart et al., 1990; Johnston and Clark, 2005; Simons and Kraus, 2005; Tax and Brown, 1998; Tax et al., 1998). Many firms leave the use of customer feedback to the customer-facing employees who do not have the visibility into or the authority to change the firm-wide processes that drive the customer feedback (Batista et al., 2008). If a firm wants to learn from the customer feedback, it has to actively manage the process that starts with the receipt of customer feedback and ends with the development of a new service offering that is inspired by the feedback.

Such a process would begin with the receipt of customer feedback by the firm. To learn from the feedback, the firm would then need to capture and analyze the input. Such analysis may generate insights that can lead to service improvements / creation of new services. Since customer feedback does not always relate to the existing or planned service offerings of the

firm, the insights may need to be stored and retrieved later on, before they get utilized in NSD. Figure 3.1 summarizes these five steps in the proposed process that may allow a firm to leverage Unsolicited Customer Input as a source of ideas for service innovation:

3.2.1 Receipt of customer input

Customer complaints and feedback can be a source of ideas for new products and services (Fornell, 1976; Goodman, 1999; Voss et al., 2004). They can also drive purposeful changes in the structure and processes of the service delivery system that allow an organization to better serve its customers' needs (Batista et al., 2008; Katz and Kahn, 1978). However, there are certain challenges that the firm looking to learn from the customer feedback needs to overcome. The biggest barrier that the firms face in learning from customer dissatisfaction with products and services is that the majority of the dissatisfaction is never voiced to the firm (Andreasen and Best, 1977; Fornell and Westbrook, 1984; Goodman, 1999; Tax and Brown, 1998). The factors that contribute to the customer's lack of willingness and desire to provide unsolicited feedback following a highly satisfying or dissatisfying service encounter include the need to expend additional time and effort, the need to confront the same individuals that may have been a part of the negative experience, the fear that their comments will not be welcome, and the uncertainty around whether the firm will take any action on the feedback provided (Tax and Brown, 1998). Research also shows that the assumption that customers give open, honest, and frequent feedback to the frontline staff may not hold universally (Voss et al., 2004). Therefore, companies should actively encourage customer feedback (Halstead et al., 1993) and make it easy for the customers to provide feedback to the firm (Hart et al., 1990; Tax and Brown, 1998) since identification of a gap between a firm's services and the customer's needs is a necessary first step for improving the firm's existing services and for creating new services (Spreng, 1995). This leads to our first proposition:

P1: Utilization of Unsolicited Customer Input in NSD requires encouraging the customers to provide feedback to the firm

It has been argued that maximizing the number of complaints from dissatisfied customers is in the best interest of the firm (Fornell and Wernerfelt, 1987), since it allows the firm to act. The firm can take appropriate action to prevent service switching by dissatisfied customers and improve the services offered by the firm (Spreng, 1995). However, if the firm is unable to provide an excellent recovery, active solicitation of complaints may result in an even lower rating of the service (Sampson, 1996). Therefore, the firm has to have policies and processes that encourage customers to provide open, honest and frequent feedback, and an excellent service recovery process that effectively deals with the complaints or comments received.

Many service firms provide an explicit service guarantee to encourage the customers to come forward with their complaints, and to ensure a consistent way of complaint handling across the firm (Halstead et al., 1993; Hart, 1988). Such a guarantee can achieve two purposes. First, it can clarify the specific level of service that the customers can expect to get (and failing which, they can get restitution from the firm) in the minds of the customers as well as the firm employees. And second, it can take out the uncertainty around whether spending additional time and effort on providing unsolicited input to the firm will produce any results or not as the service guarantee generally specifies how the firm will compensate the customer when the firm is unable to deliver the level of service promised. This focus on delivering excellent service as exemplified by the firm's service guarantee and service recovery policies can encourage the

customers to voice their concerns to the firm and therefore, positively impact the receipt of Unsolicited Customer Input. This leads to the following proposition:

P1-a: Service guarantee and service recovery policies encourage the customers to provide feedback to the firm

Service guarantees encourage customers to provide input following an unsatisfactory experience, but do not motivate those who may wish to provide the firm with inputs following a positive service encounter, or wish to suggest ways in which the firm can do something better or different. Given the need to look outside the firm for innovative ideas (Chesbrough and Spohrer, 2006; Eisenhardt and Santos, 2002; Laursen and Salter, 2006), it is important that firms tap one of the largest source of such ideas – their own customer base. Many product companies have successfully developed mechanisms that reward their customers who provide useful ideas that lead to improvements in existing offerings or lead to new offerings altogether (Nambisan, 2002). Apart from defraying some of the costs incurred by the customers in providing feedback to the firm, these incentives also signal to the customers that the firm values their inputs and reflect the value placed by the firm on such input. Service firms may also benefit from explicit and implicit incentives for the customers who provide valuable input to the firm, since these incentives compensate the customer for the time and effort spent in providing the feedback, and can encourage the customers to engage with the firm and provide meaningful input. This leads to the following proposition:

P1-b: Rewarding the customers who provide useful ideas encourages the customers to provide feedback to the firm

If the process through which the feedback can be provided to the firm is cumbersome, it can put off many customers who would have otherwise contacted the firm. A firm can provide a choice of channels to make it easy for the customers to reach the firm (Hart et al., 1990; Tax and Brown, 1998). Availability of different channels can permit the customers to choose a method that is most convenient for them, and avoid confronting any specific part of the firm that the customer does not want to provide the input to. This choice and availability of channels through which the customers can provide input to the firm can encourage them to provide unsolicited input to the firm. This leads to the following proposition:

P1-c: Availability of multiple channels through which the customers can reach the firm encourages the customers to provide feedback to the firm

An organization's concern for its customers is reflected in the policies and practices adopted by the firm. When the organization has a set of beliefs that puts the customer's interest first, the organization is said to be "*customer oriented*" or "*customer focused*" (Schneider et al., 1998). This customer focus drives the organization to determine customer satisfaction with the existing products and services, assess current and emerging customer requirements and expectations, and engage in effective customer relationship management (Evans and Lindsay, 2010; Samson and Terziovski, 1999). When the firm management considers customer feedback unimportant, the firm may collect customer feedback just to give the appearance of concern without ever attempting to address the concerns voiced by the customers (Sampson, 1999). On the other hand, the firms that have a strong customer focus go to great lengths to address the customer concerns, and to ensure that they provide excellent service to their customers

(Bowen et al., 1989; Kelley, 1992; Lytle et al., 1998; Schneider and Bowen, 1995; Schneider et al., 1992). These customer-centric policies can make the customers feel valued, and may make them more likely to engage with the firm. If the firm is more customer friendly, willing to listen, and act on the customer input, the customers would also sense this culture, and be open to giving honest input to the firm. Therefore, a customer-centric service climate in the firm can encourage the customers to come forward with their complaints as well as thoughts and suggestions (Tax and Brown, 1998). This leads to the following proposition:

P1-d: Customer-centric service climate in the firm encourages the customers to provide feedback to the firm

3.2.2 Capture of customer input

When the customer provides any unsolicited input, the firm may need to capture this input in order to learn from it. Since the feedback can contain a mix of routine queries regarding the customer's service purchase or consumption, positive or negative feedback regarding past purchases, and off-the-hook comments regarding anything else, listening to and making sense of the input can be quite effort-intensive. The firm employees that are engaged in the service delivery are usually the ones that receive the Unsolicited Customer Input. They may not have the time or a broad enough view across all service offerings of the firm to analyze the input and capture insights that may be useful in the future. Therefore, the firm employees that receive customer input may need to capture the input, and share the captured input with other parts of the firm for further analysis (Sampson, 1999). This leads to the following proposition:

P2: Utilization of Unsolicited Customer Input in NSD requires capturing and communicating customer input across the firm

Since a large proportion of Unsolicited Customer Input is negative, many service firms tend to look at the unsolicited customer feedback as an indicator of an issue that the firm needs to resolve for the customer. In fact, studies have highlighted that many service firms tend to focus only on customer recovery following a negative customer input resulting from a service failure (e.g. Johnston and Michel, 2008). If those that handle customer feedback have been given a narrow goal of only resituating the customer for the issue he or she has faced, they may not take the time to probe the customer further, even though this probing may lead to a richer input that could help the firm improve or innovate services in the future. If the incentives reward the customer-facing firm employees only for resolving the customer issues, these employees may not even be motivated to go beyond resolving the issue for the customer (Matting et al., 2004). If the firm provides enough slack to customer contact employees so that they can take the time necessary to probe the customer further, and incentivizes them to fully capture the input provided, the employees would be more likely to go beyond resolving the issue faced by customer. This may positively impact the capture and communication of customer input. This leads to the following two propositions:

P2-a: Incentives that reward the customer facing employees to probe and understand customer feedback positively affect the capture and communication of customer input across the firm

P2-b: Organizational slack that allows the customer facing employees to take the time necessary to probe and understand customer feedback positively affects the capture and communication of customer input across the firm

One of the biggest hurdles faced by the organization when it comes to learning from customer feedback stems from the lack of information that flows between the part of the business that collects and deals with customer problems and the rest of the organization (Johnston and Michel, 2008). The more negative the feedback, the more suppressed the transmission of the message (Fornell and Westbrook, 1984). Especially for service firms, if those who receive the negative feedback are part of the same service encounter that leads to such an input, they may feel uneasy about recording or communicating that input further (Tax and Brown, 1998). Transmission and receipt of negative information face challenges that relate to those who are transmitting and receiving the input choosing to avoid the transmission of bad news (Fornell and Westbrook, 1984; O'Reilly and Roberts, 1974; Read, 1962; Roberts and O'Reilly, 1974; Rosen and Tesser, 1970; Tesser and Rosen, 1975). This defensive organizational approach to complaint handling, labeled as "*see no evil, hear no evil, speak no evil*" (Homburg and Fürst, 2005), results in employees treating the complaint as an isolated incident needing resolution but not requiring a report to the management (Tax and Brown, 1998). The pervasive bias common to human communicators to encode / transmit messages that are pleasant for the recipient, and avoid those that are unpleasant (Rosen and Tesser, 1970; Tesser and Rosen, 1975) leads to such behavior. This bias impacts a firm's ability to receive, transmit and process negative information such as customer complaints. This bias also drives the filtering of negative information by the gatekeepers, those who decide what information should be allowed to enter the organization. An organization climate that is too competitive or not tolerant of negative information may make the employees unwilling to transmit or receive negative input for the fear of personal loss. On the other hand, if the organizational climate is supporting and open, and considers negative input not as an opportunity to blame someone but as an opportunity to improve, the firm may experience greater success in recording and communicating Unsolicited Customer Input without significant trimming or distortion (Fornell and Westbrook, 1984; March and Simon, 1958). Therefore, the firm may need to have an open organization culture that is tolerant of negative information to be able to benefit from the Unsolicited Customer Input. This leads to the following two propositions:

P2-c: Negativity in the customer feedback affects the capture and communication of customer input across the firm

P2-d: The firm's tolerance of negative information affects the capture and communication of customer input across the firm

3.2.3 Analysis of customer input

Just capturing the (customer) feedback does not do the firm any good. Unless the firm is able to extract insights that can drive innovation, the resources spent in capturing the feedback generate no returns; and worse yet, the customers who spend time and effort in providing the input may feel alienated by the lack of action on the firm's part. Unlike the solicited input, Unsolicited Customer Input does not follow any norms, structures or patterns, making it difficult to analyze (Koca and Brombacher, 2008). Service firms increasingly use multiple channels of service delivery and provide multiple channels for the customer to reach the firm to provide feedback (Sousa and Voss, 2006). Unless the customer feedback received through

different channels is analyzed systematically, the firm may not be able to see a coherent picture of the customers' needs and the extent to which the firm's products and services are able to meet those needs. In addition, if the feedback does not relate to current / planned set of offerings or capabilities of the firm, it may get discarded by those analyzing the input. Therefore, those analyzing the Unsolicited Customer Input need to be suitably experienced (Sampson, 1999), and be given a broad enough brief that includes the capture of insights even when they do not relate to the current offerings or capabilities of the firm. These employees also need a broad understanding of the firm's current offerings and capabilities, as well as the firm's goals for the coming years in terms of capabilities and offerings to allow them to do a meaningful and thorough job. This leads to the following three propositions:

P3: Utilization of Unsolicited Customer Input in NSD requires analysis of customer feedback

P3-a: A broad brief is required for productive analysis of customer feedback

P3-b: Suitably experienced personnel are required for productive analysis of customer feedback

3.2.4 Storage and retrieval of insights obtained from customer input

Since the insights obtained from Unsolicited Customer Input may or may not tie directly to any current NSD activities that the firm is undertaking, the firm may need to have mechanisms in place for storage of these insights in suitable form while ensuring that they remain easily accessible across relevant parts of the organization for future retrieval. By storing the insights through such a mechanism, a firm can convert the tacit or uncodified knowledge about customers' needs into explicit or codified knowledge, and ensure that such knowledge gets diffused across the firm (Boisot, 1987). Firm-wide availability of customer knowledge can help the firm in optimizing the second, third, and fourth phases of the 4-phase knowledge development cycle that includes knowledge creation, knowledge adoption, knowledge distribution, and knowledge review and revision (Bhatt, 2000). Smart et al., (2003) argue that since creation of knowledge is difficult, many organizations resort to adopting external knowledge. In order to benefit from such adopted knowledge, it is important for the firm to adapt the knowledge to the specific organizational context, and ensure that the knowledge is distributed and embodied within the firm (Smart et al., 2003). Birkinshaw (2001) considers building a system for codifying and sharing knowledge within the firm to be one of the three primary elements of knowledge management, and stresses that having such a system is a necessary but not a sufficient condition for successful knowledge management within the firm. Availability of a suitable system that facilitates analysis of customer feedback including look up of relevant past feedback, categorization or classification of insights, and coding of insights to help future search and retrieval by other parts of the firm (including the NSD function) can dramatically increase a firm's ability to benefit from such insights. This leads to the following two propositions:

P4: Utilization of Unsolicited Customer Input in NSD requires storage and retrieval of the insights obtained from customer feedback

P4-a: Availability of suitable mechanisms for storage and retrieval of such insights positively affect the storage and retrieval of the insights obtained from customer feedback

3.2.5 Utilization of insights in NSD

A customer-focused NSD implies giving extensive attention to the needs, preferences, and desires of the customers at every stage of the NSD process (Batista et al., 2008). Insights extracted from the Unsolicited Customer Input can make it easier for a firm to give the necessary attention to the customer needs, preferences and desires. However, even after insights are extracted from the customer feedback, actual utilization of these insights in NSD may not take place automatically. Since the insights don't always relate to the firm's existing or planned service offerings, the firm may have to explicitly ensure that the insights obtained from the Unsolicited Customer Input actually get utilized in NSD. The lack of focus and resulting dispersed nature of these insights also make the utilization of these insights challenging for the firm. Many service firms conduct NSD activities on an ad-hoc basis (Cooper et al., 1994; de Brentani, 1989; Griffin, 1997a; Griffin, 1997b; Menor et al., 2002; Shostack, 1984). Even for those firms that have a formal NSD process, the initial stage of idea generation can lack structure (Alam, 2006a; Herstatt et al., 2004; Khurana and Rosenthal, 1997). Given the structural disconnect between those that receive Unsolicited Customer Input and those that are responsible for NSD activities, a formal ideation stage that includes utilization (or look up) of the knowledgebase that contains the insights obtained from Unsolicited Customer Input can be helpful for the firms that want to leverage the Unsolicited Customer Input as a source of ideas for innovation. This leads to the following two propositions:

P5: Utilization of Unsolicited Customer Input in NSD requires the use of insights obtained from customer feedback in NSD

P5-a: Formal NSD process (especially the ideation stage) affects the use of insights obtained from customer feedback in NSD

3.2.6 Impact of utilizing Unsolicited Customer Input in NSD on NSD outcomes

While the literature considers customer involvement in service innovation to be very important (Alam, 2002, 2006a; Martin and Horne, 1995; Thomke, 2003), there are diverging views regarding whether such involvement is beneficial or not (Campbell and Cooper, 1999; de Brentani, 1991; Ives and Olson, 1984; Magnusson et al., 2003; Matthing et al., 2006; von Hippel and Katz, 2002). It has been argued that interaction with the customers is a necessity for successful innovation (e.g. McKenna, 1995; Wind and Mahajan, 1997). The suggested benefits include a superior capture of market information in product or service design through a firsthand contact with the customers (Biemans, 1992; Gemunden et al., 1992; Li and Calantone, 1998; Matthing et al., 2006; Souder, 1988) that leads to an increase in new service performance (e.g. de Brentani, 1991, 1995; de Brentani and Cooper, 1992; Edgett, 1994) as well as an increase in the innovativeness and final success of the product or service (Biemans, 1992; Deschamps and Nayak, 1995; Gales and Mansour-Cole, 1995; Gemunden et al., 1992; Griffin and Hauser, 1993; Håkansson and Snehota, 1995; Lukas and Ferrell, 2000; McKenna, 1995; von Hippel, 1978, 1986). However, many scholars believe that the impact of customer involvement in service / product development is not entirely positive. Some argue that customers and their input should be ignored, because the customers cannot tell a firm exactly what they want (Hamel and Prahalad, 1996; Simonson, 1993). More recently, Magnusson et al. (2003) conducted an experiment on the role of user involvement in service innovation and found that the users' ideas were original but less producible. Along similar lines, Campbell et al. (1999) found that NPD projects involving customer partnerships were no more successful than those that did not involve such partnerships. Ives and Olson (1984) found in their meta-

analysis on user involvement in designing management information systems that “*benefits of user involvement have not been strongly demonstrated*”. Bidault et al. (1994) argue that such partnerships do not automatically guarantee success and that the tension between the logic of new product development and partnering may offset possible advantages of such partnering. Therefore, it is unclear whether utilization of Unsolicited Customer Input affects the success of new services positively or negatively. This leads to the following proposition:

P6: Utilization of Unsolicited Customer Input in NSD affects the success of new services

Some argue that it can be hard for the customers to envision something that they have never experienced before (Flint, 2002; Matthing et al., 2006; Ulwick, 2002). According to the social networks theory, customers cannot provide a firm with access to potentially rich and diverse information (Granovetter, 1982; Krackhardt, 1992) that is necessary to drive radical innovation. Since customer feedback is mostly anchored to the present service use and service characteristics, listening to this feedback can lead to improvements to the existing services at best (Brockhoff, 2003). Therefore, customer feedback-driven NSD may lead to incremental improvements of existing solutions rather than radically new breakthrough products and services (Christensen, 1997; Leonard-Barton, 1995; Nambisan, 2002; Rothwell et al., 1974; Ulwick, 2002; von Hippel, 1988). This leads to our final proposition:

P7: Utilization of Unsolicited Customer Input in NSD results in the firm pursuing more incremental innovations

Table 3.1 summarizes the propositions regarding the process that may allow a firm to leverage the Unsolicited Customer Input as a source of ideas for service innovation.

3.3 Method

3.3.1 Methodology

To explore the firm processes that facilitate the use of Unsolicited Customer Input in NSD, an empirical study based on a case research methodology was conducted (Voss, Tsikriktsis, and Frohlich, 2002; Yin, 2003). The case method is particularly appropriate here for a few reasons. The relative scarcity of research in the role of Unsolicited Customer Input in the NSD process meant that this study should use a theory building methodology (Denzin and Lincoln, 1994; Eisenhardt, 1989; Glaser and Strauss, 1967; Johne and Storey, 1998; Menor et al., 2002; Miles and Huberman, 1994; Strauss and Corbin, 1990; Voss et al., 2002; Weiss, 1994), and case research addresses theory building rather than theory testing (Voss et al., 2002; Yin, 2003). It enables early, exploratory investigations where the variables are still unknown (Meredith, 1998), provides better support for results with the triangulation of data collected through multiple methods (Eisenhardt, 1989; Yin, 2003), and has been widely used in previous studies focusing on NSD (e.g. Alam, 2002, 2006a; Zomerdijk and Voss, 2010; Zomerdijk and Voss, 2011). Case research is particularly suited to NSD because NSD is usually characterized as a long, multi-person and complex process (Johnston, 1999), and the case research method allows complex and less-researched phenomena to be examined in its real-life context (McCutcheon and Meredith, 1993; Voss et al., 2002). This approach, called “*direct research*” by Mintzberg (1979), can lead to development of new theory that has high validity among practitioners as well (Meredith, 1998; Voss et al., 2002) since the rich data available from the field are better suited for uncovering hitherto unsuspected relationships between the

independent and dependent variables in a process theory (Eisenhardt, 1989; Meredith, 1998; Voss et al., 2002; Yin, 2003). However, many researchers have criticized the case research method for being less codified than the quantitative methods such as surveys and experiments. To address this concern, we followed a systematic process of conducting case research in this study (Adams, Day, and Dougherty, 1998; Voss et al., 2002).

3.3.2 Sample size and selection

We opted for a multiple case study approach, a purposive sampling procedure, and multiple data collection methods (Alam, 2002; Eisenhardt, 1989; Leonard-Barton, 1990; Yin, 2003). A purposive sampling strategy (Patton, 2002) was used since random selection of cases is considered inappropriate for learning and theory building (Eisenhardt, 1989; Miles and Huberman, 1994). To limit variation attributable to geographic location of the firms and to sharpen the external validity (Wilson and Vlosky, 1997), we specified a population of service firms that were operating in the south-east of England. We purposefully selected service firms that varied on the size (in terms of revenue and number of employees), nature of customer relationships (B2B vs. B2C), and years in existence (Alam and Perry, 2002). The companies that were known for involving customers in the NSD process were identified through industry contacts. Companies from different sectors were specifically selected to gather a rich set of ideas and insights, to increase the likelihood of obtaining variability in the results (Patton, 2002), and to portray across industries the range and depth of the phenomena being investigated (Bonomo, 1985; Zomerdijk and Voss, 2011). We also paid attention to the likelihood of obtaining access to key individuals in the organization such as top management, employees responsible for customer support, and employees responsible for NSD. Of the thirteen companies contacted, four companies did not agree to participate. From the remaining nine companies, one turned out to be a start-up firm that was yet to begin trading, and was eliminated from further scrutiny as they did not have any customers yet. The resulting set consisted of eight service firms with varying levels of success in utilizing customer input in the NSD process. These companies differed in size, nature of customer relationships (B2B vs. B2C), and the length of time for which they had been in business. The participating companies and the types of services offered by them are listed in Appendix 2. Names of the participating companies and their services have been disguised to maintain anonymity as requested by the managers. While there are a few disadvantages of anonymity, it helps to reduce bias (Drumwright, 1996), and has been used in past qualitative research (e.g. Alam, 2006a; Workman Jr, Homburg, and Gruner, 1998). Complete anonymity was promised to the participating firms to ensure that the firms share the details of their NSD practices without any concerns around others judging the firm based on such disclosure. Therefore, we do not divulge much information about the participating firms and their services in this chapter.

To explore our propositions, we gathered data on innovation projects undertaken by these eight service firms over the last three years. We focused on the use of Unsolicited Customer Input in new service development at the *program* rather than at the project level. Individual innovation projects are often affected by idiosyncratic factors and situations that may not continue from one project to the next (Alam, 2006a; Clark and Fujimoto, 1991), and a firm's long-term success generally depends on the performance of its portfolio of innovation projects and not just on the performance of a specific innovation project (Cusumano and Nobeoka, 1992). Investigating a portfolio of innovation projects from each case provides a more representative picture of each organization's overall new service development program and is less likely to result in a sample of exception and outlier projects (Alam, 2002; Kessler and Chakrabarti, 1999). It is argued that service firms often have an overarching culture that guides

their service development activities (Alam, 2002). This culture usually influences a firm's inclination towards involving customers in the NSD projects through the use of customer input in the NSD process. So, a program-level focus can provide better insights into the overall long-term firm practices around customer involvement in NSD (Alam, 2002; Barczak, 1995). Also, the innovation projects undertaken earlier than three years were not included since it was feared that the respondents might not clearly recall the firm practices associated with innovation projects that were undertaken a long time ago (Alam, 2002; von Hippel, 1976). Therefore, the reference point for the respondents when answering questions concerning customer involvement in NSD was the portfolio of innovation projects undertaken by the firm in the last three years.

3.3.3 Data collection and fieldwork

Data collection consisted of key-informant interviews (interviews of senior firm personnel / decision makers as opposed to consumers) since the purpose of this study was to explore the processes used by managers and practitioners to leverage Unsolicited Customer Input in the development of new services in their respective firms (Dexter, 2006). A total of 24 such in-depth in-person interviews were conducted by the author in early 2009. We followed the key-informant method for data collection and chose the respondents based on their familiarity with the firm's portfolio of innovation projects or with the firm's customer support function. For this, we started by identifying potential informants through industry contacts, and then applied the technique of snowballing to reach other key-informants within each firm (Moriarty, 1983). The final set of respondents that contributed to the data collected for this study held titles ranging from "Chief Executive", "Operations Director", "Service Delivery Director", and "Marketing Director", to "Head of Client Development", "Customer Support Executive", "Director of Programming", and "Product Manager". Their tenure with their respective firms ranged from 2 years to 20 years with majority falling in the range of 3 to 5 years (65%). Out of the 20 respondents, 14 were men and 6 were women. By relying on multiple respondents, we were able to create a richer picture of the existing firm practices around customer involvement in NSD at each firm, and were also able to cross-check and resolve any conflicting or inconsistent responses received from any of the respondents (Van Bruggen, Lilien, and Kacker, 2002). The selected respondents were contacted by an advance email to schedule the interview and by a follow-up phone call to introduce the research team and to explain the research objectives.

A semi-structured interview format was used to allow the flexibility necessary to let the respondents delineate their views more freely. In addition, a pre-developed interview protocol was used to guide the discussions and to make the line of questioning relatively uniform across cases (Yin, 2003). This protocol included questions that broadly asked about the five primary stages of the proposed process that can connect Unsolicited Customer Input with the NSD activities. The questions did not address any of the process stages or the propositions directly to ensure that the questions did not lead the respondents to agree to the propositions to either make the firm processes look good, or to please the researchers. The protocol was constructed after an extensive review of the existing NSD literature, and was tested and refined through consultations with academics and practitioners who had significant experience in conducting case research through key-informant interviews. The interview protocol is summarized in Appendix 1. Each interview lasted for over an hour, and mostly consisted of open-ended questions. In line with the existing guidelines for theory generation through case research (Eisenhardt, 1989; Voss et al., 2002), we started with an introduction to ensure that the respondents were aware of the agenda and scope of the discussions. We then asked broad

questions to assess the role played by the respondents within the context of customer involvement in NSD to ensure that appropriate questions were directed at them. After the scoping, we asked the interviewees to describe the parts of the customer support or NSD process they were familiar with, and sought their comments on how Solicited and Unsolicited Customer Input were used to drive service innovation. Then, we switched to a slightly more structured format and asked a set of pre-determined questions that probed them further on the process they had commented on. These questions were designed to probe the process followed by the firm to connect the customer input to the NSD activities within the firm, including the receipt and capture of Unsolicited Customer Input, analysis and dissemination of insights derived from Unsolicited Customer Input, and utilization of these insights in the NSD activities. We then encouraged the participants to reflect on each step in the process and describe the factors that could impact the success of each step. To ensure that no detail was lost, we audio-recorded all the interviews as well as took detailed notes. A summary of the interviews conducted is shown in Appendix 2. Wherever possible, we also consulted archival records relating to the firm's NSD projects to enable triangulation and to improve the validity of the data (Eisenhardt, 1989; Yin, 2003). These included internal firm communication related to the lessons learned from Unsolicited Customer Input, communication between the firms and their customers who had provided input that the firm later on used in the NSD activities, and NSD project documentation that detailed the impact of Unsolicited Customer Input on the choices made at various stages of the NSD process.

3.3.4 Data analysis

We followed the data analysis methods suggested by Eisenhardt (1989), Miles et al. (1994), and Yin (2003), including transcription of the interviews and synthesis of these transcripts and notes taken during the interviews and other data collected subsequently to develop an integrated case for each of the eight case firms. Detailed case descriptions were drawn from the transcribed interviews as well as the notes taken during the interviews that ran into hundreds of pages of transcripts. These were analysed through ATLAS.ti - a software for qualitative data analysis (Lewins and Silver, 2007), to allow systematic analysis and to prevent any information-processing biases (Eisenhardt, 1989; Miles and Huberman, 1994; Zomerdijk and Voss, 2011). We used a pre-defined list of codes to identify and capture emerging themes. This process resulted in the development of tables and matrices based on common themes and facilitated cross-case analysis (Alam, 2002; Miles and Huberman, 1994). These emerging themes were grouped based on each of the five process steps and related propositions described in the previous section with the goal of finding patterns of similarities and differences among cases. The summary case statements were then organized in text files and key quotations were noted (Patton, 2002) to add transparency and increase the depth of understanding. We also reflected on these themes by contrasting them with the extant literature on customer involvement in NSD to find practices that were specific to the use of Unsolicited Customer Input in NSD (Eisenhardt, 1989; Zomerdijk and Voss, 2011). Finally, the trustworthiness of the research was assessed by applying the criteria of credibility, integrity, transferability, dependability, and confirmability (Alam, 2006a; Hirschman, 1986; Lincoln and Guba, 1990). Key issues and themes that emerged from this analysis are discussed below.

3.4 Results

All except for one case firm stated that taking Unsolicited Customer Input into account was useful for developing a better and differentiated service with superior value for the customers.

Some respondents also emphasized a reduction in the development cycle time as another key benefit of listening to Unsolicited Customer Input as a starting point for NSD. While most case firms (seven out of the eight) were keen on involving customers in the NSD process, they did not have a consistent way of handling customer feedback. There was huge variation in terms of the extent to which the firms leveraged the Unsolicited Customer Input in NSD. Seven firms had some sort of a process to connect the unsolicited input with the NSD activities within the firm, ranging from completely formal (five firms) to completely informal and ad-hoc (two firms). One firm recorded the Unsolicited Customer Input, but did nothing about it. The firms that did have a pre-determined process for handling Unsolicited Customer Input reported a greater use of Unsolicited Customer Input in NSD. The firm that did not have such a process in place reported that they did not see much value in customer feedback in terms of its potential to help the firm innovate. It is hard to say whether the feedback received by this firm was such that the firm was demotivated from using it to drive innovation, or whether it was the firm's lack of appreciation that made the customers withdraw from providing meaningful input to the firm. Either way, firm processes for handling customer input clearly reflected the value placed by the firm on leveraging the Unsolicited Customer Input in NSD. Unsurprisingly, the firms that did not utilize Unsolicited Customer Input in NSD reported that they did not see any value in doing so, whereas the firms that had found ways to leverage Unsolicited Customer Input in NSD reported that utilizing Unsolicited Customer Input in NSD had improved the likelihood of success for their new services. One of the case firms even claimed that over half of their breakthrough ideas had come from the unsolicited comments or feedback received from the customers. We now examine the broad themes and (presence or absence of) support for each of the prepositions in detail.

3.4.1 Proposition 1: Encouraging the customer to provide input

All case firms believed that they needed to encourage the customer to provide input to the firm. They did so in various ways designed to show (to the customer) that the firm was genuinely interested in receiving the input, and was determined to take action based on the input. One respondent, CEO of the specialist tour operator said "*Customers do not provide meaningful feedback when they somehow have an impression that no one really cares. Richness of the feedback (received from the customer) depends on how much the customers trust the firm and how frequently they engage with the firm*". Another respondent, CEO of the web-based training portal said "*Depending upon the extent of interactions customers have with the service, the customer may engage with the service provider for a very short period of time. If the firm wants the customer to think at the next level about what they may want to get from the service, then the firm has to motivate the customer to do that. The firm has to motivate the customer to interact with the firm every step of the way*". To encourage the customers to provide feedback, this firm created a "what bugs you" page on its website that prompts the customers to contact the firm to discuss anything that bugs them.

Whether the firm kept the customers in the loop regarding the action taken based on the feedback also seemed to impact the subsequent receipt of customer input. One of the respondents, the Operations Director at the online fieldwork and panel specialist said "*At the minimum, you have to acknowledge the feedback. Customers obviously like it if you act (on the input), but they get really upset if they do not hear at all (from the firm)*". The product director at the software services firm said "*To ensure enthusiastic and committed dialogue with the customers, we have to show clearly that we take the input seriously. In addition to addressing the concerns raised, it is vital that we follow up on any unresolved queries or concerns and keep them in the loop*". The automotive service specialist and the university-industry collaboration

facilitator implemented an active strategy to encourage the customers to provide feedback to the firm. They found that a gentle probe asking for very short, concise feedback about the customer's recent experience with the firm enticed the customer to come back to the firm with a richer set of unsolicited inputs. Collectively, five out of the eight firms considered encouraging the customers to provide feedback to the firm an essential part of their effort to learn from customer feedback, and had some sort of a strategy for encouraging the customers to connect with the firm and provide insightful feedback. This provides broad support for the proposition 1 regarding encouraging the customers to provide feedback.

3.4.2 Proposition 1-a: Use of service guarantee and service recovery

All B2C case firms except one reported using some form of service guarantee to encourage the customers to come forward in case of any issues experienced with the service. For example, the automotive servicing specialist used a strategy of clearly communicating the level of service that the customers can expect to receive from the firm, including what they can expect from the firm in case of any service delivery failures attributable to the firm. The marketing director at this firm commented "*Okay, so we have the same approach it's just bullet proof, it almost looks foolhardy to the uninitiated because they think aren't customers going to take advantage of you. It comes down to what you think about (the) human nature, is everyone out to get you or is everyone out to just be good to each other. I think my view is that it is the latter*". This service guarantee created clear and uniform understanding for the customers and the firm employees alike regarding the level of service customers could expect the firm to deliver. This encouraged the customers to get back to the firm whenever something went wrong as they knew that the firm would take prompt action given its explicit service guarantee. This also reduced the likelihood of any filtering of customer feedback at the time of receipt since the service guarantee mandated that any shortfall experienced by the customer be remedied, and the instance be recorded for future improvements. The B2B firms did not use a separate service guarantee since their contractual agreement with each customer clearly dictated the terms of the engagement, specified the level of service expected, and the remedies available to the customer in case of a failure. The only exception to this was the university-industry collaboration facilitator, which did not have explicit or implicit service guarantee since the firm's services were funded by the government but used by other organizations. Overall, six out of the eight case firms had specific service guarantee and recovery procedures, and these policies were considered conducive to increasing the receipt of customer feedback. This provides strong support to proposition 1-a regarding the use of service guarantees and service recovery to encourage unsolicited customer feedback.

3.4.3 Proposition 1-b: Rewards for the customers who provide feedback

Use of rewards for the customers who provide feedback was quite prevalent among the case firms. According to one of the respondents, the CEO of the automotive servicing specialist, "*anyone willing to engage with the firm should have an incentive, and continued engagement should also be rewarded from time to time*". To encourage the customers to provide feedback to the firm, some of the case firms instituted monetary as well as non-monetary incentives. This required them to decide on whom they should listen to – the buyer or the user (when the service was usually purchased by one entity and consumed or used by another entity), and then, come up with appropriate incentives. One of the respondents, the CEO of the software developer firm said "*we have to walk a fine line when it comes to listening to our customers. While people in HQ (corporate headquarter) usually sign the PO (purchase order), it's generally*

the people located on-site who actually use our software. And as you can imagine, these two groups have very different concerns and priorities". One of the case firms, the web-based training portal, experimented with monetary incentives for the customers who provide valuable feedback to the firm. While the incentives did increase the volume of feedback received, the quality of feedback went down. Two case firms (the software services firm, and the online fieldwork specialist firm) chose to provide in-kind incentives. Any service improvement or new service that resulted from the customer feedback was offered to the feedback providing customer on a complimentary basis for a period of time, or was offered to that particular customer ahead of the general launch of the new offering. Both firms reported that these incentives resulted in a steady stream of customer feedback that allowed the firms to innovate and stay ahead of the competition. The automobile servicing specialist had a slightly different approach to incentivizing the customers. Rather than reward random feedback, they tied the incentives to the instances of service failures reported by the customers that led to the firm doing something differently going forward. Collectively, these four firms achieved reasonable level of success with the use of incentives to encourage customer feedback. This provides moderate support for the proposition 1-b.

3.4.4 Proposition 1-c: Multiple channels for the customers to reach the firm

Availability of multiple channels for the customers to reach the firm was considered useful for encouraging receipt of customer feedback by two case firms. Apart from making it less cumbersome for the customer, a choice of channels that allows the customers to reach firm personnel at different seniority levels can also avoid the situations which force the customers to confront the very same individuals about whom they want to provide feedback. The marketing director at the automotive servicing firm said "*sometimes, people don't want to talk to the same guy. They get really apprehensive about whether the negative comments will get binned (by the floor staff) instead of being passed on. Indeed, if the firm collects feedback locally, it is an operationally challenging task to ensure that feedback is consistently captured, is not filtered, is not misplaced, and is communicated to the rest of the firm in a timely manner*". Another respondent, the Regional Operations Director at the same firm, further commented "*we used to get our staff at the till to ask the customer if everything was ok. But after receiving no complaints over four months, we got a bit curious. Instead of getting the guy at the till to ask the customer about his experience, we included a small note with the invoice that invited the customer to write / email / phone me (the regional director) if they had any issues. Voila! We got more responses in one week than we did in previous four months*".

However, one case firm, the web-based training portal, commented that channels available to the customers for contacting the firm should match their disposition. According to the CEO of this firm, "*The channels offered should allow the customer to have a choice in how and when he engages with the firm, should be convenient, and should also allow the firm to capture customer identity so that the firm can probe the issue further if necessary*". This firm's service included web-based career and management skills training modules, and its clients resided in over 18 countries even though the firm primarily operated from the UK. They initially provided web-based customer support, requiring customers to contact the firm through messages sent by email or through a "contact us" page on the website. To encourage the customers to provide more frequent feedback to the firm, they decided to experiment with a phone-based customer care team operating 24x7. After many months of trials and tweaks, they finally went back to the purely web-based customer support after the phone-based customer care failed to improve the quantity and quality of feedback received from the customers.

Overall, availability of multiple channels for the customers can reach the firm seemed to positively affect the receipt of customer input for the case firms. This supports proposition 1-c.

3.4.5 Preposition 1-d: Customer-centric service climate

Customer-centric service climate and the presence (or absence of) a structured process to utilize unsolicited customer feedback in NSD showed a strong correlation across all case firms. The stance taken by top management regarding the value and importance of customer input seemed to play a crucial role in determining whether the rest of the organization viewed customer input as critical, useful, or even relevant to its success. One respondent, the CEO of the automobile servicing firm said "*There is a culture; it is a very strong culture now. I mean you either fit in that or you don't. And that culture has to be customer-oriented*". On the other hand, if the firm does not respect its customers, its attitude towards customer input is not that receptive. In this case, the firm would not put much thought into how it can benefit from leveraging Solicited and Unsolicited Customer Input. When asked about the value placed by the firm in the customer feedback it received, one respondent, the CEO at the web-based training portal commented – "*We do hear from our customers from time to time. But mostly, it's crap. I don't think we have ever received a suggestion from our customers that ultimately led us to (develop) a new service*". When the customer support executive at the same firm was asked about what the firm did with customer feedback apart from resolving any client / instance-related issue, his response was "*we put that in a database, but I don't think anyone ever looks at that*". Therefore, it seems that the presence (or the absence) of a strong customer-centric service climate affects not only the receipt of customer input, but also the rest of the process. This leads to expanding the original proposition:

P1-d: Customer-centric service climate in the firm affects the entire process of utilizing Unsolicited Customer Input in NSD

3.4.6 Preposition 2: Capturing and communicating customer input

One of the case firms, the online fieldwork and panel specialist, had realized that a lot of the feedback provided by the customers was getting filtered at the frontline. Those who were responsible for receiving the customer input did act on the input whenever they could, but did not inform senior management about the input received. This created an information anomaly that prevented the firm from making sense of what the customers were trying to tell the firm repeatedly. Frontline personnel could not take a broad view on the customer input and decide strategically given their rank in the organization, and the senior executives never saw the feedback. This resulted in the capture and communication of customer input becoming a major concern for the firm's top management. Other case firms also reported similar experiences relating to the need to capture customer input for future learning. Only one case firm differed from the others on this. This firm, the web-based training portal, did record customer feedback, but only to keep track of the amount of time the firm took to resolve the specific customer issue, and not for any future learning. All the other case firms had the dual goal of resolving the specific customer issue (if any) and leveraging the input to improve existing services and come up with new services.

All of the case firms also reported an increasing level of attention paid to capturing customer feedback expressed in the social media and other web-based discussion forums. One respondent, the CEO of the automotive servicing specialist, commented "*it is important for us*

to know what the customers are telling us, but it is more important for us to know what they are telling everyone else about us. We frequently search and look at online message boards although we receive more information from direct customer interactions at the moment". One case firm had a group of firm personnel specifically responsible for scouring the web to discover what the firm's customers were saying about their experiences with the firm. Another case firm chose to develop a discussion board on its corporate website where users could post comments, ask questions, report any issues, and discuss their experiences with the firm's products and services. The firm owned the platform, but did not censure or moderate the posting, allowing the customers an unconstrained opportunity to build a community of like-minded customers who shared the patronage of this firm's products and services. This discussion board provided a convenient platform for the users to network with other users, and created a place for the firm's NSD team to get ideas from. Many of the service improvements as well as new services developed by this firm were developed as a result of a customer's post or as a result of a reply posted by one customer to answer a question raised by another customer. The other case firms did not have such a systematic way to go about collecting the indirect customer feedback, although each firm did have an informal mechanism to look at the customer comments that were left in the public domain about the firm's products and services.

While all the case firms had started monitoring the indirect feedback that their customers had left elsewhere, there were mixed opinions around the depth and usefulness of the information obtained through monitoring such indirect feedback. For example, one case firm, the web-based training portal tracked mentions of their service through Google alert service, but did not find the comments that useful. When asked about why the firm had continued monitoring the web for such comments, the CEO said "*as more and more customers rely on online sources of information before and after consuming a product or service, the importance of monitoring this space for the business will continue to grow. And just because we have not found anything useful so far, does not mean that the feedback is not adding any value. No news is (also) good news*". As the number of web users continues to grow, as the economies around the world transform into digital economies, and as the internet becomes the unifying medium for customers and service providers, firms may need to give increasing importance to keeping a tab on the customer feedback that is expressed in the public domain including on the internet. This leads to expanding the original proposition:

P2: Utilization of Unsolicited Customer Input in NSD requires capturing and communicating both direct and indirect customer input across the firm

3.4.7 Proposition 2-a: Incentives for customer-facing employees

3.4.8 Proposition 2-b: Organizational slack for customer-facing employees

In recording and communicating customer input, a firm faces a few hurdles. One of these is the scarcity of time needed by the customer facing employees to fully understand the input, especially when they are rewarded for keeping their interaction with the customer short. To tackle this challenge, one case firm, the software services provider, required and incentivized the frontline employees to record every single piece of feedback received from the customer rather than asking them to handle a specific number of customer queries in a given amount of time. This not only improved the probing and capture of customer feedback, but also resulted in dramatically higher levels of customer satisfaction as the customers felt that the firm valued its relationship with them and took the time to listen whenever they contacted the firm. The university-industry collaboration facilitator implemented incentives for the firm personnel who

capture valuable customer feedback leading to a change in the way things are done by the firm. The web-based training portal eliminated the reporting of “average time taken to answer a customer email / phone call” completely to avoid the employees rushing through their response just to get to the next call. This signalled to the customer care personnel that the firm valued a thorough response to the customer’s query more than keeping the time taken to respond short. Other case firms also adopted similar policies to ensure that the unsolicited feedback received by the firm gets captured fully by those who receive such feedback. Collectively, the organizational slack and incentives that encourage capture of customer feedback were considered important by seven out of the eight case firms to ensure that most of the customer feedback gets captured. This provides strong support for propositions 2-a and 2-b.

3.4.9 Proposition 2-c: Negativity in the feedback

3.4.10 Proposition 2-d: Firm’s tolerance of negative information

All except one case firm were concerned about the impact of negativity in the feedback on the capture of such feedback. The CEO of the automotive service specialist said “*we also have to worry about the suppression of customer feedback by the customers as well as our own employees. People are less likely to give negative feedback in person, especially if the person receiving the feedback is part of the situation that leads to the negative feedback. And then, the employee can also filter the feedback if he is part of the service encounter that the negative feedback relates to*”. To reduce the filtering of input due to negativity in the feedback, case firms implemented a variety of solutions. The university-industry collaboration facilitator created an informal rule that any issues reported to the top management won’t start a blame game and would be taken only as an opportunity to improve. The goal was to create an open organizational climate that was open to criticism, negative feedback, and failures. The specialist tour operator created systems so that any customer feedback that came to the firm was routed directly to the senior management, reducing the possibility of front-line filtering. Collectively, these three firms had routines in place to reduce the filtering of feedback at the frontline and other parts of the firm. Other firms did consider the possibility of customer input filtering by those receiving the input, but did not have a specific strategy to address it. This provides good support for preposition 2-c that suggests that negativity in customer feedback may impact the capturing of customer feedback, but provides only moderate support to proposition 2-d that suggests that a firm’s tolerance of negative information positively affects the capture and communication of customer feedback.

3.4.11 Preposition 3: Analysis of customer feedback

There was wide consensus among the case firms that the analysis of customer feedback is crucial for the firm to learn from customer feedback. According to one of the respondents, the CEO of the automotive service specialist, “*the greatest challenge is to take a rich knowledge base and understand which parts are relevant*”. According to the operations director at the specialized tour operator, the customers don’t always clearly identify the underlying need / issue / concern and frequently raise issues without giving it a serious thought. Many times, the inputs are instance-specific, and the inputs received from different customers are contradictory. At times, the input does not correspond with the firm’s existing offerings or planned offerings, making it difficult for the firm to take the input seriously. For example, the customers of the automotive service specialist frequently asked the firm to help them buy automobiles, do bodywork, or undertake warranty repairs on their vehicles, although the firm

has had a singular focus on MOT and routine servicing from the onset. Together, seven case firms reported the existence of some sort of a process for analysis of customer feedback as the customer comments could not be taken verbatim. This supports proposition 3 that analysis of customer feedback is a required step in leveraging Unsolicited Customer Input in NSD.

3.4.12 Preposition 3-a: Broad brief for customer feedback analysis

3.4.13 Preposition 3-b: Experienced personnel for customer feedback analysis

Given the huge volumes associated with the feedback received, analyzing these inputs required an explicit allocation of resources by the firm. One respondent, a product manager for the software services firm, said "*Listening to the customer is not enough, there has to be a mechanism to effectively analyze the (customer) requests to understand the drivers of such requests, choose the ones that need action, and prioritize the effort. The process needs ownership and sufficient resources assigned to the process to be effective*". This firm found the customer requirements to be too specific at times, requiring the firm to separately assess the overlap (if any) between specific client requests and the needs of the market. Another respondent stated "*They (the comments) usually tell us about the unmet customer needs, but (obviously) can't spell out the solution. It is up to us..(to analyze the input and come up with possible solutions)*".

Another challenge was the fragmented nature of the feedback coming through different channels, making it difficult for the firms to get a bigger picture. One of the participants – the marketing director for the automotive servicing specialist, said "*The biggest challenge is to bring in a 360-degree view of all of that different feedback. This is not an easy task because you have possibly got feedback coming in through your call center, you have got verbal (feedback) on the shop floor, you have got SMS, you've got email, you've got web, you've then got potentially independent surveys.. but if you focus on using that information rather than retaining (them) in independent silos where they are actually of no use to anybody, which I think is a challenge we all have*".

To address this challenge, the case firms used a variety of ways. The software service firm created a senior position reporting directly to the firm CEO, and made this person solely responsible for all of the customer feedback received across the channels. This person also formally headed the NSD initiatives undertaken by the firm, and therefore, became an unambiguous link between the customer feedback and the NSD efforts. A team of analysts reporting directly to this position was tasked with the analysis of customer feedback, and was collectively responsible for all the feedback received across the channels. These resources were trained not to take customer comments verbatim, but to look at them in the context of the big picture to identify emergent themes and the underlying need / issue / concern they represent. This team was also responsible for separating the instance-specific components from the generic components that can trigger firm-wide actions in terms of improvements to an existing service or the creation of a new service. Even with all the training and explicit goals, the process was still considered quite subjective. One respondent noted, "*of course (these are) human beings trying to analyze or trying to categorize e-mails from other human beings which are not necessarily very precise, there is some arbitrariness there*". To tackle this challenge, the firm required that the same feedback was analyzed by two different individuals. If their opinion differed, the feedback was then routed to the senior management including team heads, and at times, to the CEO himself.

Two other case firms instituted a weekly, organization-wide meeting where any stakeholder communication that needed addressing was brought into the meeting and debated. The CEO of one of these two firms, the university-industry collaboration facilitator commented on the nature of these meetings saying "*These debates must not be mixed up with (the) routine business. They must be (reserved) specifically for discussing new developments, exceptions, issues, or feedback that requires the firm to change the way things are done. That way, things are patched up together and an overall picture is constructed which allows the things to be seen with the global perspective*". Any action resulting from such debate was then classified as either a one-off or applicable going forward within the given set of circumstances. If so, it was formalized so that the wheel did not get reinvented in the future. They also made discussion and dissemination of customer input a formal activity, and involved everyone from customer care, operations, marketing & sales, and senior management in these meetings.

Together, only three out of these seven firms – the software service provider, the university-industry collaboration facilitator, and the specialist tour operator provided a broad brief and assigned suitably experienced personnel for the analysis. Other firms did not have a formal process to analyze customer feedback - the responsibility was shared between the customer care, NSD, and those directly reporting to the top management of the firm. This provides moderate support for propositions 3-a and 3-b that a broad brief and suitably experienced personnel are required for the analysis of customer feedback.

3.4.14 Proposition 4: Storage and retrieval of insights

3.4.15 Propositions 4-a: Availability of suitable systems for the storage and retrieval of insights

Except for one, no other case firm reported having specific processes or systems in place for storage and retrieval of insights obtained from customer feedback. The software services firm did have an elaborate process through which the insights were codified, prioritized, and stored for future use. This was primarily done to create logical combinations of development activities that can be undertaken in the most efficient manner by the firm. The process also helped the firm save ideas that were considered less important for the time being. The product manager at this firm said "*But that is not to say that it is not important now, so it won't be important six months from now. Good ideas that do not fit with the current (product or service) strategy may become valuable in the future since the priorities may change*". If the firm has a way to save and retrieve the ideas periodically, it may be able to benefit from past insights that become important at some point in the future. The rest of the case firms (seven out of eight) did not have a systematic way to store and retrieve the insights. Instead, these firms mainly relied on senior firm employees to champion specific NSD needs identified from the unsolicited customer feedback. This does not provide much support for the propositions 4 and 4-a. Further research is needed to ascertain whether the storage and retrieval of insights is indeed not practiced widely or that this is just an artifact of the small sample used in this study.

3.4.16 Proposition 5: Use of customer insights in NSD

Finally, the firms sought to ensure that the insights obtained from the unsolicited customer feedback were actually utilized in NSD. Some firms waited until a large number of customers expressed similar views, whereas the others did not wait that long. One respondent, the CEO of the automotive service specialist, said "*While we can't wait for the input to be statistically significant, we also can't try to do everything that everyone has asked for. Then you never get*

anything done". Another respondent, the head of Panel Management at the online fieldwork and panel specialist, observed "It is the sheer mass of complaints we receive that is driving us to act on that. But since this means we need to change the way we run our business, change our practices, it takes some time, it's got some effort to do that. I think it's not necessarily a single e-mail that makes the difference it's the mass". At times, the firms ended up converting the anecdotal evidence regarding a latent need into a quantifiable business opportunity since the insights obtained from customer input were quite narrow, and the NSD team did not know whether there was wide enough support for something so specific across the wider customer base. They looked at how many other customers had a similar need, how much revenue could the firm generate by offering the new service, how wide was the potential client base, and how similar or dissimilar were their needs, before the firm went ahead with the idea.

The software service provider frequently found itself in situations where the insight was judged to have a broad appeal, but the action did not necessarily fit within the firm's planned innovation roadmap for the near future. A group of senior firm personnel then ended up re-prioritizing the current roadmap of service innovations that the firm was to undertake in the coming months, quarters, and years in light of the assessment of the new ideas by considering the expected commercial and non-commercial aspects surrounding the new ideas. This involved creating logical combinations of development activities by considering how the proposed departure from the planned innovation roadmap could directly and indirectly affect the trajectory of the firm's services for the foreseeable future. To achieve this, the firm invited each part of the organization to grade the new idea along various lines, and selected those that achieved the highest support from every part of the firm. This usually involved considerations of whether the firm could do it, and whether the firm really wanted to do it given the fit (or lack thereof) between the current firm strategy and the new service being considered. This buy-in from internal stakeholders made the actual development, testing, and launch of the new service much more efficient for the firm. At times, it also meant rejecting an idea that had a lot of customer interest because the benefits for the firm were not large enough to justify the effort involved, or because the idea did not have sufficient internal buy-in. So, the utilization of customer feedback in NSD involved elaborate steps involving the use of insights as one of the starting points for the NSD activities. This strongly supports preposition 5 that use of insights obtained from customer feedback as a starting point for NSD is a required step in leveraging unsolicited customer feedback in NSD.

3.4.17 Proposition 5-a: Formal NSD process (including the ideation stage)

All of the case firms stated that they considered a systematic way of developing new services a key to a successful development. One of the respondents, the CEO of the automotive service specialist, said "*the firm must structure the value proposition, do a full-fledged financial analysis, develop a clear Technicolor vision of what exactly the firm will offer, how it will deliver, and who will take up the service for satisfying what needs, before proceeding further. This can't be done on an ad-hoc basis*". The steps also included deciding whether the firm would go for a phased introduction or go for a big bang approach, completing the development, and doing a trial run before a full-scale launch. For conducting a trial, some of the case firms reported using the same customers whose unsolicited or solicited input had led to the development of the new service. Others specifically chose a new set of customers to check whether the service appealed to a broad range of customers. Communication across various parts of the firm regarding the upcoming innovation was considered vital. The operations director at the online fieldwork and panel specialist commented "*Communication across the board plays an important role. Unless everyone is in the loop, things may fall*

through the cracks. It avoids last minute surprises, and also avoids any duplication of the efforts". Echoing the importance of keeping everyone in the loop, another respondent from the same firm commented "There should be some firm-wide mechanism that keeps a tab on new ideas / projects pursued by various groups and allows them to converge so that initiatives do not conflict, and things do not get duplicated. Here we have many new developments that were undertaken over time without such an oversight. As a result, now we have a lot of useful things here and there, but we are unable to fully benefit from them given the lack of integration". This provides strong support for proposition 5-a.

3.4.18 Validation of insights through solicited customer feedback

The NSD teams at the case firms frequently faced concerns around the impact of innovation inspired by customer feedback on the existing service offerings of the firm and around the commercial viability of the idea even when the idea came from the customers themselves. One respondent, the operations director at the online fieldwork and panel specialist, said "*Innovation and development always looks like its revenue generating but they forget how expensive it is...*". While seven out of the eight case firms valued the unsolicited feedback for letting the firm learn about the unmet customer needs, all seven firms were apprehensive about developing a new service solely based on the unsolicited input provided by a small group of customers. To address these concerns, they took the insights obtained from unsolicited feedback to a representative sample of customers to perform a sanity check in terms of whether other customers also faced a similar issue, and how important the issue was to them. This included assessing the appeal of the proposed idea to a wider group of customers, understanding how beneficial the proposed change / innovation was or could be for the customer, and gauging the associated willingness to pay to judge whether the idea was commercially viable for the firm to undertake. Through solicited feedback, the firms also obtained more specific details required to undertake the change requested by a customer. In selecting the customers to solicit the input from, the firms usually chose to interact with the most demanding customers. The product manager at the software service provider commented "*these customers help elevate the level of our internal thinking and product conceptualization activities, and make the resulting service more likely to succeed in the market*". To ensure enthusiastic and committed participation by the invited customers, the firms endeavoured to show that they took the customer input seriously, addressed the concerns raised during such interaction, followed up on any unresolved queries or concerns, and kept the group in the loop between the meetings. The customers liked the opportunity to be the driving force behind the evolution of a product or service and to be "in the know" about the next set of features that the service or product was likely to have. For the software services firm, the customers were other businesses, who also valued the ability to network with their contemporaries in a non-competitive setting offered by the service provider's brainstorming and idea generation sessions. Collectively, five out of the eight case firms had an explicit policy of soliciting input from a select group of customers before taking any action on the unsolicited customer feedback. This leads to an additional proposition:

P5-b: Use of insights obtained from customer feedback in NSD requires the use of Solicited Customer Input

3.4.19 Preposition 6: Impact of utilizing Unsolicited Customer Input in NSD on NSD Success

Case firms indicated many reasons for utilizing unsolicited feedback to drive NSD. Listening to

the customer was considered vital in order to figure out exactly what the customers wanted and valued. This was considered even more important when the firm had recently ventured into a new industry or new customer base since the firm did not have that much domain knowledge. Many case firms had experienced the shortcomings of primary and secondary market research, and believed that such research usually did not correctly or completely reveal what the customers really wanted. Many times customers did not know what they really wanted, and their answers to the questions posed by the firm were not really useful. The firms learned a lot more by analyzing the unsolicited input given by the customers during their normal encounters with the firm. A case firm, the specialist tour operator, found that solicited input provided more hypothetical than real answers. The CEO of this firm noted "*When asked, customers said "yes" to many things, presumably because there was no reason for them to consider the tradeoffs and ask for less of anything*". Only when the customer himself contacted the firm to indicate the desirability of a benefit, the firm was able to take it seriously.

All except for one firm also stated that the more vocal customers were often more demanding than the other customers. Listening to them and ensuring that the firm was able to meet their stringent demands made the firm more competitive for the entire market. At one firm, unsolicited feedback from demanding customers resulted in a thorough review of internal firm processes and led to many changes that ultimately allowed the firm to offer faster turnaround times to all of the customers across the board. They also found that timely probing was important - asking customers about something they had experienced in the remote past did not yield much, but asking them about their most recent experience and including forward-looking questions proved very useful since the customers were able to tie-in their experience with the ways things can be improved for the future. As commented by the CEO of the web-based training portal, customers usually do not write down ideas to pass them on to the firm as and when the firm approaches the customers for input. Unsolicited input usually contains ideas / reflections customers have while being in a specific state while contacting the firm about something, and these ideas usually get lost unless the firm captures them. A gentle probing when a customer contacted the firm for any reason enticed the customer to provide a richer set of inputs to the firm that later allowed the firm to go from the symptoms to the underlying causes. By addressing these issues, the firms were able to respond to the customer concerns, and develop new services before the competition was able to. Collectively, all except one case firm believed that utilization of Unsolicited Customer Input in NSD contributed towards the success of the firm's new service offerings. This strongly supports preposition 6.

3.4.20 Preposition 7: Impact of utilizing Unsolicited Customer Input in NSD on the Type of innovation pursued

The impact of utilizing Unsolicited Customer Input in NSD on the type of innovation (incremental vs. radical) pursued by the firm was not that clear. Most case firms (seven out of eight) considered new services mainly from the market potential point-of-view, and whether the firm wanted to grow in that particular direction. When the case firms received input asking for a service that required the firm to move away from its current set of offerings or enter a new market segment, the idea was usually not that well received by the firm. Unless the firm already had plans to move into that particular market segment, the firm was quite likely to discard the idea without much deliberation. The CEO of the web-based training portal said "*The idea also needs to align with the space in which we want to have a presence. For example, we are a career skills portal. We don't act on suggestions that ask us to provide relationship advice since we do not view ourselves in that space*". The firms also evaluated the idea in terms of whether the idea provided a functionality or benefit to the customer not available

elsewhere regardless of whether the idea was close to the firm's current offerings or not. If the idea was about replicating a functionality that the users already had at their disposal through other service providers, the firms were very reluctant to take it further especially when the idea was not close to the firm's current offerings. This generally meant that the firms usually acted only on those ideas that the firm could execute without stretching the firm's current set of capabilities, and discarded those that tried to take the firm into untested waters. As a result, the feedback driven innovations that were finally pursued ended up being more incremental than radical although the customer feedback itself did have a mix of incremental and radical ideas. While this supports proposition 7, further research is needed to explore this in more detail and ascertain the contextual factors that may be influencing the choices made by the firms regarding which customer-proposed ideas are developed, and which ones are discarded.

3.4.21 Impact of utilizing Unsolicited Customer Input in NSD on NSD Speed:

Responses from case firms indicated another benefit of utilizing customer input in NSD – a shorter development cycle. Product / service development cycle time is one of the important issues faced by service firms across the world because innovations are copied quickly in service industries (Alam and Perry, 2002; Johne and Storey, 1998). One respondent, the CEO of the web-based training portal said "*Customers sometimes validate an idea we already have, and remind us about its importance. We had a customer who wrote in asking for certain functionality on the website, and after going through his request, we realized that we had the same idea, but hadn't considered it to be that important before, and hadn't found the time to get to it. But the customer asking for it made that a priority and the idea was implemented soon thereafter*". Another respondent, the product director at the software service provider said "*Since the idea comes from the customer himself, there is no need to be bogged down with market research. We can move straight to development. It is also easier to find the customers willing to test your work-in-progress – just contact the customers who provided the original idea in the first place!*". The reduction in the length of the development cycle for the case firms was a result of three factors: customers made the firm aware of unmet customer needs that would have otherwise taken longer for the firm to realize by itself, created a sense of urgency for the development of ideas that the firm already had by signaling the value of the idea to the firm, and eliminated the need to conduct market research to validate the ideas. Collectively, this led to the case firms developing innovations at a faster pace. This leads to the following additional proposition:

P8: Utilization of Unsolicited Customer Input in NSD results in a shorter development cycle

3.4.22 Formal process and training

Case firms indicated that the process of utilizing unsolicited customer feedback to drive NSD effort required connecting three different parts of the firm: those who receive and record customer feedback, those who analyse the feedback, and those who use the insights obtained from the feedback in NSD. Each part of the firm can have different priorities and different set of performance metrics. This made it challenging for the case firms to keep all three parts in sync. Customer-facing employees did not always have the time to listen to the customer and didn't always know what to ask, what to record, and whom to pass the input to. They could not decide whether the input was important or not; and if the input did not relate to something very specific, where to route the input to. To address these issues, one case firm, the university-industry collaboration facilitator, made receiving and recording unsolicited

feedback a formal part of the job for a group of personnel. They made ten people responsible just for receiving and recording feedback from various stakeholders including customers, and thoroughly trained these resources to capture specific details such as what was the issue, why it was an issue, how critical was the issue, what the customer would ideally want the firm to do, and how the firm could reach the customer to probe it further. Another firm, the software services provider, reported putting in place a process that systematically routed feedback from buyers and users of the service to the appropriate parts of the firm. According to the CEO of the automotive servicing specialist, the firm had to *"think the process through and decide beforehand on things like how the input would get captured, up to what level would the information be reported, who then would have access to that information, what actions were to be triggered when, and how would the firm use the insights obtained from the input"*. They also imparted training to all of their customer-facing employees to ensure that the employees knew how to probe the customer further when he contacted the firm, and made it mandatory for the employees to capture customer identification details so that the firm can contact the customer again if necessary.

This input was then routed to various parts of the firm as appropriate, and a catch-all path was specified for any input that was hard to classify. According to the CEO of the automotive servicing specialist, it was important to have a clear owner for each stage in the process that could consistently apply a pre-determined set of criteria and decide on the next course of action. This firm also implemented a work-flow process that automatically sent personalized updates to the customer who provided the initial input that resulted in specific firm action. A respondent from this firm said *"We have to ensure that any communication sent by the firm before or after an unsolicited contact has some personal touch and shows the customer that the input will make a difference. Customers do not like to fill out forms or provide details unless they feel that the feedback will reach the correct level, will be taken seriously, and will be followed up with the necessary action"*. These emails provided the firm with a two-fold benefit: they not only kept the customer in the loop, but also allowed the firm to reach the customer for further probing. The updates freed up the frontline employees from the burden of having to answer follow-up questions from the customer regarding the specific issue, and also signalled to the customers that the firm took their input seriously. Another case firm, the online fieldwork and panel specialist did not put in such an elaborate process, and chose to rely on informal interactions between the frontline staff and senior personnel. The senior management of this firm ended up fielding a lot of inquiries from frustrated customers who had repeatedly provided feedback to the frontline staff, but had not seen any action on the firm's part. When the senior management confronted the frontline staff regarding the issues / feedback, it was usually difficult to trace who had dropped the ball. When asked about the opportunities lost by the firm because of this, the operations director at this firm said *"Again hard to say, because it is hard to quantify really or to give a weight to the different problems, frustrations they (the customers) have. I think the biggest impact in my eyes is the number of customers who leave us"*. This indicates that a formal process that keeps everyone on the ball and appropriate training for everyone involved in the process are required for the firm to be able to leverage the unsolicited customer feedback in NSD. This leads to the following additional propositions:

P9: Utilization of Unsolicited Customer Input in NSD requires a formal process with a designated owner for each process stage

P10: Utilization of Unsolicited Customer Input in NSD requires specific training for resources involved in each stage of the process

3.4.23 Industry Clockspeed:

Case firms displayed wide variation in the extent to which they leveraged Unsolicited Customer Input in NSD, how they went about it, and the level of success they experienced in utilizing the input to drive NSD. Apart from the impact of explicit choices made by the firms regarding the utilization of Unsolicited Customer Input, “Industry Clockspeed” (i.e. the rate of change within an industry) (Mendelson and Pillai, 1998; Miller, 1987) also seemed to have an effect on the willingness and the desire of the firm to listen to and act upon the Unsolicited Customer Input. Case firms in global, highly competitive, and extremely dynamic industries were under immense pressure to keep innovating just to survive. They needed to adjust the rhythm of their internal operations including NSD activities to the dynamics of their external business environment by finding ways to innovate frequently and quickly. These firms constantly looked for new ideas to improve their existing services and to come up with new services, and were more open to learning from the customer input. One respondent, the CEO of a specialist tour operator commented *“Our market is in a constant flux. We need to be market driven and not product driven if we are to survive and grow with the changing market”*. On the other hand, the case firms that were in relatively stable industries where the services had not changed much over the last few years were not under such a pressure to innovate. These firms did not worry as much about utilizing every possible source of idea for innovation including the unsolicited customer feedback. This leads to an additional proposition:

P11: Industry clockspeed affects the firm’s desire to innovate, and therefore affects the utilization of Unsolicited Customer Input in NSD

The process utilized by most case firms to leverage Unsolicited Customer Input in NSD primarily consisted of four steps: receive, capture, analyze, and utilize. Figure 3.2 graphically depicts these steps. For the case firms, the success of each step of the process depicted above was affected by many contextual as well as firm-related factors. Table 3.2 summarizes the revised and expanded set of prepositions related to process stages and the factors that affect each of the stages, as observed from the case studies.

Finding a way to utilize Unsolicited Customer Input involved some trial and error on the part of the case firms as the firms did not always get the process right at the first attempt. This is in line with the finding of Sampson (1999) that the customer feedback systems evolve over time. However, after a few iterations, the process exhibited several common characteristics. Across the cases, we observed a clear divide between the firms that valued the Unsolicited Customer Input as a source of ideas for innovation, and the firms that did not. The firms that successfully integrated the insights obtained from Unsolicited Customer Input as a key source of ideas for innovation asserted that while the Unsolicited Customer Input itself was unstructured, the action taken by the firm on the receipt of such input did not need to be ad-hoc. According to these firms, receiving the unsolicited input from the customers was just the beginning. The critical link between customer input and successful service innovation was the middle step - the firm's ability to take the input (which mostly represents the customer's needs / customer's view on what may serve that need), and translate that into a new service that the firm is able to deliver, and that meets the specific needs faced by the customer (without necessarily being in the form expected by the customer) while making business sense for the firm. The Unsolicited Customer Input does not usually focus on anything in particular, and therefore, analyzing and leveraging this input is usually quite a resource-intensive exercise. The process to handle this feedback can benefit from having a clear owner for each specific step in the process, with someone taking end-to-end responsibility for the whole initiative. One

respondent, the director of service delivery for the online fieldwork and panel specialist, commented "*Unless someone is responsible for closing the loop, many internal initiatives may just fall through the cracks. I can think of many projects in which we were supposed to investigate the causes of too many scope change requests, but never got anywhere since no one was asking for a closure*". The case firms also structured incentives for the personnel to specifically reward them for the behaviours and outputs the firm wanted from them with respect to the utilization of unsolicited feedback. One respondent, the CEO of the automotive service specialist commented "*The firm must ensure that the employees have the same ethos as those of the firm when it comes to customer service. The customer does not interact with the entire firm – he interacts with a small number of employees only. Unless these employees are receptive to the feedback, whatever else you do (to utilize the feedback) becomes useless*".

These firms also ended up experimenting with various process variations to come up with the right mix of formal processes and informal interactions among various parts of the firm that worked for their specific settings. They trained the firm personnel, left enough slack for the employees to take the time necessary to probe, capture, and analyse the feedback, and created an open environment where negative feedback was treated as an opportunity to improve and not as an evil to be avoided at all costs. When such slack was not available, a firm may find itself occupied with day-to-day operational matters with little time to benefit from customer input. One respondent, director of service delivery for the online fieldwork and panel specialist, commented "*Learning from customer input requires reflection. Unless there is sufficient slack, there may not be enough time to generate the learning and put it to use. Our operations people are always chasing delivery deadlines under extreme pressure, and never have the time to reflect*". Analysing the input provided by the customer did require a significant investment of resources for these firms, but the firms that made this investment reported achieving greater market place success through faster development cycle times and more satisfied customers.

3.5 Discussion and Conclusion

Previous research has documented the benefits of a customer-oriented service development process including superior innovation and greater new service success (Alam and Perry, 2002; Gruner and Homburg, 2000; Jaworski and Kohli, 1993; Lukas and Ferrell, 2000; Martin and Horne, 1995; Slater and Narver, 1994; von Hippel, 1988), and has argued for utilizing customer input throughout the development process. However, this literature does not comment on how the firm should involve the customers in the NSD process, including how the firm should receive customer input and what the firm needs to do to benefit from such input. The findings of this research highlight the emerging practices around these issues, and point to several areas that appear worthy of further studies.

Our findings suggest that firms may be able to develop superior and differentiated services as well as shorten the development cycle time by leveraging the Unsolicited Customer Input in NSD. As argued by many scholars (e.g. Cohen, Eliashberg, and Ho, 1996; Lambert and Slater, 1999; Wind and Mahajan, 1997), we also observe that customer-feedback-driven innovations face the risk of being incremental in scope since majority of service innovations driven by the unsolicited feedback result in improvements or changes to the existing services rather than leading to the creation of completely new offerings. However, contrary to the prior belief, our analysis indicates that such innovations actually have a greater chance of succeeding. Idea generation is considered the most important stage in the NSD process (Alam and Perry, 2002), and customers are a very important external source of ideas (Alam, 2006a). Being aware of the

need to put in place a specific process that can connect the Unsolicited Customer Input with the NSD efforts, and the appreciation of the benefits that the firm can gain through such use, can be critical in ensuring that the firm does not miss the opportunity to benefit from this resource that the firm already has to its disposal.

The firms that are looking to leverage the unsolicited customer feedback as a source of ideas for service innovation may need to consider the following. First of all, firms may need to be proactive in creating and supporting a customer-centric environment within the firm since this customer focus can have an overarching effect on the receptiveness of the frontline employees towards receiving and recording Unsolicited Customer Input, on the firm's middle management's sense of importance and urgency associated with the analysis of unsolicited customer feedback, and the prioritization of ideas extracted from the Unsolicited Customer Input when the NSD team is looking for the next wave of innovation projects. This commitment to prioritize customer needs over other considerations can then percolate into specific firm practices and behaviours displayed by the customer-facing firm personnel, who can either encourage the customers to connect with the firm, resulting in the receipt of timely and insightful feedback, or can turn the customers away through a tendency to disregard customer input unless the firm is contractually obligated to act. This can strongly impact the customers' willingness to invest the time and effort necessary to connect with the firm and provide input that can help the firm to improve existing services, and identify areas of opportunities that can lead to the introduction of new services. When the customers feel that their input is received by the firm with appreciation and is looked at quite seriously by the firm, they may feel motivated to provide more valuable input to the firm. This can result in a virtuous cycle where more useful input leads the firm to appreciate the input more, and greater appreciation on the part of the firm further motivates the customers to engage with the firm even more.

Second, given the challenges of lack of focus, disconnect between those who receive the feedback and those who are engaged in NSD, and the sheer volume of input that needs to be sifted through, it may be important for the firm to carefully devise a process to ensure that the ball does not get dropped along the way from the receipt to the utilization of input in the NSD activities. As Sampson (1999) puts it, "*it is unlikely that they (the firm) will act on the feedback if there is no system in place for putting the feedback to work*". Equally important are the factors that seem to affect the success achieved by the firm in each step of the process. For the firms looking to leverage Unsolicited Customer Input in the firm's NSD efforts, the first challenge is to ensure that the customers take the time to engage with the firm and provide meaningful input. A customer-centric firm environment, a well-publicized commitment to delivering an excellent service as evidenced by the firm's service guarantee and service recovery policies, and facilitation of customer input receipt through provision of multiple communication channels that make it convenient for the customer to provide input can help the firm ensure that customers provide the firm with meaningful input that goes beyond the usual incidence-specific support Q&A. A firm can also incentivize customers to provide valuable input through appropriate monetary or non-monetary incentives that reward the customers for providing feedback that leads to an improvement in an existing service or to the creation of a new service altogether.

Third, the receipt of Unsolicited Customer Input may be a necessary but not a sufficient step for ensuring that the firm actually benefits from the insights hidden in this input. The firm may need to capture and communicate the input within the firm, analyse the voluminous records to capture the essence of customer feedback, and get the NSD team to look at these insights obtained from the customer feedback. A formal process, training, and aligned incentives for

the firm employees involved in these steps may be critical in ensuring that the customer input-based insights actually get connected with the NSD activities. Tolerance of negative information, and availability of the necessary slack for those who receive, record, and analyse customer input can ensure that the employees take the time to fully capture the feedback and do not distort any negative input for the fear of displeasing senior management of the firm.

Fourth, the internet and social media seem to be becoming more and more important when it comes to understanding the needs, desires, expectations, and perceptions of the customers. A firm may need to have an active strategy for monitoring this space for any indirectly expressed customer views that may provide valuable learning for the firm. The firm can further benefit by playing an active role in ensuring that the firm's customers have a focal point within the cyberspace where customer experiences including delights and disasters can be discussed by the firm's customers. This can make it easier for the firm to keep track of customer opinion, and also engage with the customers further as and when necessary to fully understand their input to allow the firm to learn from their input.

Finally, the availability of customer-input based insights does not always seem to lead to the utilization of these insights in NSD. A formal NSD process as well as training and incentives for NSD personnel that train and encourage them to utilize customer input-based insights in NSD may be necessary to ensure that these insights do indeed get utilized in NSD initiatives.

Figure 3.1 Proposed Process of Utilizing Unsolicited Customer Input in NSD



Figure 3.2 Observed Process of Utilizing Unsolicited Customer Input in NSD

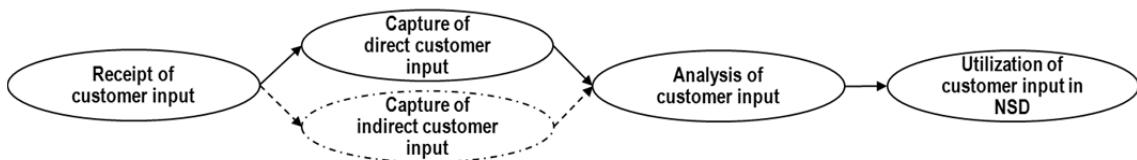


Table 3.1 Summary of Propositions

P1	Utilization of Unsolicited Customer Input in NSD requires encouraging the customers to provide feedback to the firm
P1-a	<ul style="list-style-type: none"> • Service guarantee and service recovery policies encourage the customers to provide feedback to the firm
P1-b	<ul style="list-style-type: none"> • Rewarding the customers who provide useful ideas encourages the customers to provide feedback to the firm
P1-c	<ul style="list-style-type: none"> • Availability of multiple channels through which the customers can reach the firm encourages the customers to provide feedback to the firm
P1-d	<ul style="list-style-type: none"> • Customer-centric service climate in the firm encourages the customers to provide feedback to the firm
P2	Utilization of Unsolicited Customer Input in NSD requires capturing and communicating customer input across the firm
P2-a	<ul style="list-style-type: none"> • Incentives that reward the customer facing employees to probe and understand customer feedback positively affect the capture and communication of customer input across the firm
P2-b	<ul style="list-style-type: none"> • Organizational slack that allows the customer facing employees to take the time necessary to probe and understand customer feedback positively affects the capture and communication of customer input across the firm
P2-c	<ul style="list-style-type: none"> • Negativity in the customer feedback affects the capture and communication of customer input across the firm
P2-d	<ul style="list-style-type: none"> • The firm's tolerance of negative information affects the capture and communication of customer input across the firm
P3	Utilization of Unsolicited Customer Input in NSD requires analysis of customer feedback
P3-a	<ul style="list-style-type: none"> • A broad brief is required for productive analysis of customer feedback
P3-b	<ul style="list-style-type: none"> • Suitably experienced personnel are required for productive analysis of customer feedback
P4	Utilization of Unsolicited Customer Input in NSD requires storage and retrieval of the insights obtained from customer feedback
P4-a	<ul style="list-style-type: none"> • Availability of suitable mechanisms for storage and retrieval of such insights positively affects the storage and retrieval of the insights obtained from customer feedback
P5	Utilization of Unsolicited Customer Input in NSD requires the use of insights obtained from customer feedback in NSD
P5-a	<ul style="list-style-type: none"> • Formal NSD process (especially the ideation stage) affects the use of insights obtained from customer feedback in NSD
P6	Utilization of Unsolicited Customer Input in NSD affects the success of new services
P7	Utilization of Unsolicited Customer Input in NSD results in the firm pursuing more incremental innovations

Table 3.2 Case Study Observations

		Case A	Case B	Case C	Case D	Case E	Case F	Case G	Case H
P1	Utilization of Unsolicited Customer Input in NSD requires encouraging the customers to provide feedback to the firm	Y		Y	Y	Y	Y		
P1-a	Service guarantee and service recovery policies encourage the customers to provide feedback to the firm	Y	Y	Y			Y	Y	Y
P1-b	Rewarding the customers who provide useful ideas encourages the customers to provide feedback to the firm	Y		Y	Y		Y		
P1-c	Availability of multiple channels through which the customers can reach the firm encourages the customers to provide feedback to the firm			Y		N			Y
P1-d	Customer-centric service climate in the firm affects the entire process of utilizing Unsolicited Customer Input in NSD	Y	Y	Y	Y	Y	Y	Y	Y
P2	Utilization of Unsolicited Customer Input in NSD requires capturing and communicating direct and indirect customer input across the firm	Y	Y	Y	Y	Y	Y	Y	Y
P2-a	Incentives that reward the customer facing employees to probe and understand customer feedback positively affect the capture and communication of customer input across the firm	Y			Y	Y			Y
P2-b	Organizational slack that allows the customer facing employees to take the time necessary to probe and understand customer feedback positively affects the capture and communication of customer input across the firm	Y			Y	Y			Y
P2-c	Negativity in the customer feedback affects the capture and communication of customer input across the firm	Y	Y	Y	Y		Y	Y	Y
P2-d	The firm's tolerance of negative information affects the capture and communication of customer input across the firm	Y			Y				Y
P3	Utilization of Unsolicited Customer Input in NSD requires analysis of customer feedback	Y	Y	Y	Y		Y	Y	Y
P3-a	A broad brief is required for productive analysis of customer feedback	Y			Y				Y
P3-b	Suitably experienced personnel are required for productive analysis of customer feedback	Y			Y				Y
P4	Utilization of Unsolicited Customer Input in NSD requires storage and retrieval of the insights obtained from customer feedback	Y							

P4-a	Availability of suitable mechanisms for storage and retrieval positively affects the storage and retrieval of the insights obtained from customer feedback	Y						
P5	Utilization of Unsolicited Customer Input in NSD requires the use of insights obtained from customer feedback in NSD	Y	Y	Y	Y	Y	Y	Y
P5-a	Formal NSD process (especially the ideation stage) affects the use of insights obtained from customer feedback in NSD	Y	Y	Y	Y	Y		
P5-b	Use of insights obtained from customer feedback in NSD requires the use of Solicited Customer Input	Y		Y	Y	Y		Y
P6	Utilization of Unsolicited Customer Input in NSD positively affects the success of new services	Y	Y	Y	Y	Y	Y	Y
P7	Utilization of Unsolicited Customer Input in NSD results in the firm pursuing more incremental innovations	Y	Y	Y	Y	N	Y	Y
P8	Utilization of Unsolicited Customer Input in NSD results in a shorter development cycle	Y	Y	Y	Y	Y	Y	Y
P9	Utilization of Unsolicited Customer Input in NSD requires a formal process with a designated owner for each process stage	Y	Y	Y	Y	Y		
P10	Utilization of Unsolicited Customer Input in NSD requires specific training for resources involved in each stage of the process	Y		Y	Y	Y		Y
P11	Industry clockspeed affects the utilization of Unsolicited Customer Input in NSD	Y	Y	Y	Y	Y	Y	Y

Note: A 'Y' indicates that one or more supporting examples for the observation were found in a particular case study firm. An 'N' indicates that one or more examples that opposed the observation were found in a particular case study firm. The absence of 'Y' and 'N' indicates that such examples were not observed in the particular firm.

Chapter 4. An empirical investigation of the process through which a firm can obtain innovation-driving insights from Unsolicited Customer Input

4.1 Introduction

Service innovations play a critical role in driving growth, revenue and profits for companies across industries. The interdisciplinary nature of services and the characteristics such as intangibility, perishability and inseparability from the customer (Berry, 1980; Lovelock, 1983; Zeithaml and Bitner, 2003) require the firms to synthesize different ideas and perceptions, and utilize novel ways to organize and process information for the innovation to take place.

Since the ultimate goal of any service innovation is to create a service that the customers would value, most service firms consider their customers as one of the key sources of ideas for innovation (Alam, 2002). As a source of innovation, customer input can provide firms with more than just the ideas for innovation. Even when the firm is able to come up with the same ideas that can be obtained from customers, ideas generated internally lack market credibility before they are tested in the market. On the other hand, the same ideas received from the customers carry a sense of realism as they represent needs and desires of the customers themselves who are the final users of any new service introduced by the firm. Therefore, the same ideas can easily get attention and buy-in of senior management of service firms, when they come from customers themselves. The customer input that can drive a firm's innovation efforts can be divided into two distinct categories: *Solicited Customer Input* (i.e. SCI) (when the firm initiates the contact with the customer), and *Unsolicited Customer Input* (i.e. UCI) (when the customer initiates the contact).

Solicited input is generally quite focused, and is obtained through a pre-determined set of channels at the time of firm's choosing since the firm initiates the contact. On the other hand, the Unsolicited Customer Input is generally more diverse (ranging from extremely positive or negative views on existing services to ideas about new services that the customer wants the firm to provide), and comes through a variety of channels over the entire lifecycle of the service. Given the unpredictability, diversity, and lack of focus in the unsolicited feedback, most service firms find it difficult to utilize it in their NSD efforts. This leads to many service firms relying mostly on the solicited customer feedback as to understand customer preferences, needs, and priorities even though they already have access to a richer set of customer inputs that comes unsolicited to the firm through usual customer contact instances over the lifecycle of the existing services.

The role of *Solicited Customer Input* as a driver of innovation has been researched widely (e.g. lead users, co-creation, and tool kits for user innovation). However, the role of *Unsolicited Customer Input* in the context of service innovation has received very little attention from the OM scholars so far, except for the literature on service recovery that looks at certain aspects of improvements to existing services by learning from service failures (Johnston and Michel, 2008; Miller et al., 2000; Roth and Menor, 2003; Zhu et al., 2004), and the Business Process Management (BPM) literature that examines the *Unsolicited Customer Input* with the goal of improving existing business processes for the firm (Childe et al., 1994; Kumar et al., 2008; Maull et al., 2003; Maull et al., 1995; Smart et al., 2003).

This chapter attempts to bridge this gap by examining the process through which the firms can derive innovation generating insights from the *Unsolicited Customer Input* and the external as

well as the internal factors that may affect such a process, with the goal to build an academically rigorous and grounded in practice model that can guide the future research and influence industry practice on customer-driven service innovation.

The rest of the paper is organized as follows. First, extant literature on service innovation and NSD that focuses on customer involvement in service innovation is reviewed and key gaps are identified. This is followed by a brief discussion of the conceptual framework this chapter builds up on. Next section describes the research methodology including the process followed for developing the constructs; scale development, validation, and refinement; data collection process including sample selection and survey administration; and validation and robustness checks performed on the data collected through the survey. This is followed by the description of data analysis including the initial model, the refined model, and the model fit statistics. The results are presented next, and show a strong link between operational processes designed to facilitate receipt, capture, analysis, and dissemination of customer input across the firm, including customer and service focus, slack available to firm employees, formal process, training, and incentives for firm employees, incentives for the customers to provide inputs to the firm, tolerance of negative information, and the firm's ability to obtain innovation-driving insights from the Unsolicited Customer Input. Finally, a discussion of the results is presented along with the practitioner implications.

4.2 Literature Review

We first examine the scope of service innovation and NSD and then review the relevant literature on customer involvement in NSD.

Service Innovation & NSD: Service innovation is the goal of NSD activities. New service development (NSD) refers to the overall process of developing new service offerings (Johnson et al., 2000) - from idea generation to launch or implementation (Cooper et al., 1994). It comprises of various activities that start with idea generation and concept development, and end with a successful launch of the new service (Johnson et al., 2000; Khurana and Rosenthal, 1997; Menor et al., 2002).

Corresponding with the increasing role played by services in the economies of developed as well as developing countries, NSD process and innovation has emerged as one of the important and active areas of innovation management research (Flint, 2002; Slater and Narver, 1995). Service innovation is also immensely important for businesses given the ever-evolving nature of markets, increasing dominance of services in the economies of developed as well as developing countries across the globe, and progress in science and technology that increases the pace of change in products as well as service industries (Fitzsimmons and Fitzsimmons, 2001; Johnson et al., 2000).

Customer input and NSD: Understanding customer needs is a vital part of any NSD process (Stevens and Dimitriadis, 2005). Customers contribute to the innovation cycle by generating consumer demand (Gupta and Mirjana, 2000; Vargo and Lusch, 2004) and by being a source of ideas (Von Hippel, 2001; Von Hippel et al., 2002) apart from driving final success as the sole judge of the service innovations introduced by the firms. Therefore, many scholars believe collaboration with customers to be a valuable way to achieve both innovation and economic success (Biemans, 1992; Gales and Mansour-Cole, 1995; Gemunden et al., 1992; Håkansson and Snehota, 1995). Because of the centrality and frequency of their interactions, customers are considered to be one of the most important and useful sources of information for firms

(Kandampully, 2002; Voss et al., 2004). Customer involvement may lead to new product ideas, enhanced product development effectiveness, and even reduced time to market for new products (e.g. Alam and Perry, 2002; Campbell and Cooper, 1999). Customer involvement in NSD is considered by most researchers to be not only useful, but also vital for success of the NSD process (de Brentani, 1991; Matthing et al., 2006; von Hippel and Katz, 2002). Customer involvement is considered especially important during the initial and final stages of the NSD process which correspond to the idea generation and service launch activities (Alam and Perry, 2002; von Hippel, 1986). However, a lack of understanding around how to involve customers in the development process is seen by many as one of the reasons why service innovation has remained an elusive task (de Brentani and Ragot, 1996; Johne and Storey, 1998).

Firms receive customer input throughout the life cycle of a service encounter – including pre-purchase, purchase, and post-purchase stages. This input can be solicited or unsolicited, positive or negative, and can be given directly to the firm or indirectly through other channels. Customer inputs can be divided into two categories based on the locus of the initiative: solicited, and unsolicited (Brockhoff, 2003). While solicitation for inputs can be directed (high degree of firm control over the selection of customers who receive the solicitation and issues on which the input is sought) or undirected (Brockhoff, 2003), unsolicited input is mostly undirected since firms cannot dictate who provides feedback and what the feedback is about.

Firms can employ a variety of qualitative and quantitative market research techniques such as surveys, focus groups, consumer panels, one-on-one interviews, and customer-observations to better understand customer needs (Cooper and Edgett, 1999; Griffin and Hauser, 1993; Rosenau Jr et al., 1996). Even though the firm can exercise a high degree of control over how, where, and when such input is solicited and who is chosen to provide inputs, magnitude and frequency of such Solicited Customer Input can be limited given that the firm has to initiate the process, and the context in which the input is sought is generally quite narrow. On the other hand, while there are limited ways for the firm to get unsolicited input from the customer, the frequency and magnitude of such input may far outstrip those of the solicited input given that the unsolicited input does not need firm initiative and does not have to be limited to any specific context or service.

While both types of customer inputs – solicited as well as unsolicited can be a source of ideas for the NSD process, there are important differences between the two that impact how a firm can go about utilizing each type of input in the NSD process. Since solicited customer feedback is obtained through customer contact that a firm initiates, a firm can carefully decide the types of customers to engage (Gruner and Homburg, 2000; Lettl et al., 2006; von Hippel, 1986), the level of involvement sought, the stages of the innovation process in which the customers can get involved (e.g. Callon, 1999; Christensen, 1997; Cooper, 2001; Leonard-Barton, 1995; Nambisan, 2002; Rothwell et al., 1974; von Hippel, 1988), what is asked from the customers, and where & how the interaction takes place (Deszca et al., 1999; Leonard and Rayport, 1997; Martin and Horne, 1995; Matthing et al., 2004; Prahalad and Ramaswamy, 2000). Solicited customer input involves explicitly chosen samples, can involve customers as well as non-customers, and the collection of such input usually takes place over a finite period of time. On the other hand, Unsolicited Customer Input is received only when a customer initiates the contact. Therefore, a firm has very little control over who provides the input, when they provide the input, and what the input relates to. The receipt of such unsolicited input takes place on a continuous and on-going basis with no definite conclusion (Sampson, 1996; Sampson, 1999).

In addition, while the Solicited Customer Input is generally requested by those who are involved in NSD activities, the Unsolicited Customer Input is generally received by others and not by those who are formally involved in NSD. Such Unsolicited Customer Input can be a result of a customer experiencing delight or outrage (Rust and Oliver, 2000, Schneider and Bowen, 1999, Voss et al., 2004) following an excellent service experience or a service failure with the later more likely to be the case than the former. A review of service quality and service recovery literatures suggests that most firms primarily focus on recovering the customer following a service failure and miss out on the opportunity to improve the quality of existing services as well as come up with new services based on the feedback (Barlow and Moller, 1996; Hart et al., 1990; Johnston and Clark, 2005; Simons and Kraus, 2005; Tax and Brown, 1998; Tax et al., 1998).

The structural disconnect between those who receive the unsolicited input and those who need to utilize the insights from this input into NSD activities, and additional challenges posed by the lack of control firm has over when, where, how, and who provides such input, may make it difficult for the firm to leverage Unsolicited Customer Input as a source of ideas for service innovation. Therefore, it is important to examine the factors that affect a firm's ability to use the Unsolicited Customer Input in NSD. Next section presents a conceptual framework and related prepositions that are subsequently tested through a wide-scale survey of service firms.

4.3 Conceptual Framework and Propositions

Firms looking to leverage Unsolicited Customer Input to drive service innovation face a number of challenges. First of all, the customers do not always provide inputs. When provided, the input is not always given directly to the firm. And the input that is provided to the firm is generally received by the firm employees that are generally not involved in the NSD activities for the firm. Since the insights obtained from the Unsolicited Customer Input may or may not relate to the current set of NSD initiatives, they may be discarded or put away for possible future use. Before the firms can leverage Unsolicited Customer Input as a driver of service innovation, the firm has to ensure that customers engage with the firm and provide meaningful input, their input is accurately recorded by the firm personnel, and the recorded input is then analyzed by suitably experienced and trained personnel to identify innovation opportunities. Since the customers do not always provide the input directly to the firm, a firm may also need to find ways to take into account the customer input that gets expressed elsewhere. We argue that the factors that affect each of these four steps – receipt of direct customer input, capture of direct customer input, capture of indirect customer input, and analysis of customer input, have a significant impact on a firm's ability to leverage the Unsolicited Customer Input in the firm's innovation efforts.

4.3.1 Receipt of direct customer input

Firms receive customer input throughout the life cycle of a service encounter – including pre-purchase, purchase, and post-purchase stages. This input can be solicited or unsolicited, positive or negative, and can be given directly to the firm or indirectly through other channels. While a customer who has had a negative experience is more likely to contact the firm than is a customer who has had a positive experience, only five to ten percent of dissatisfied customers choose to contact the firm following a service failure (Tax and Brown, 1998). So, the biggest barrier the firms face in addressing customer dissatisfaction with products and services

is that the majority of the dissatisfaction is never voiced to the seller (Andreasen and Best, 1977; Fornell and Westbrook, 1984; Goodman, 1999; Tax and Brown, 1998). While the Unsolicited Customer Input can help the firms innovate (Fornell, 1976; Goodman, 1999; Voss et al., 2004), the firms need to receive this input in the first place, and that does not always happen (Temkin and Temkin, 2011). Research has also shown that the assumption that customers give open and honest feedback to the frontline staff may not hold universally (Voss et al., 2004). So, the very first hurdle that the firm needs to overcome is the customer reluctance to engage with the firm and provide input. To do so, the firm may need to have policies and processes in place that encourage the customers to provide open, honest, and frequent feedback, before such feedback can be put to any use by the firm. There are a number of factors that may impact the receipt of direct customer input by a firm:

Customer contact frequency: The nature of a firm's services may significantly influence the chances of a customer engaging with the firm. Some services by design do not provide any opportunity for a customer to interact with the firm employees, whereas other services may provide optional opportunities for interaction or may even require active interaction between the customer and a firm employee for the customer to avail of the service. The more the customers contact the firm, the higher the chance of them providing input directly to the firm. Therefore, this customer contact frequency as dictated by the nature of the service can have a strong positive impact on the receipt of direct customer input for a firm. This leads to the following proposition:

P1: Customer contact frequency positively affects the receipt of direct customer input

Incentives for customers: While the customers that have experienced a service failure may be motivated to provide feedback to the firm to seek redress, those who may wish to provide the firm with inputs following a positive service encounter, or wish to suggest ways in which the firm can do something even better would generally lack the motivation to do so. Even when there are opportunities for the customers to provide input to a firm, not all customers choose to spend the time and effort required to provide unsolicited inputs to the firm. Given the need to look outside the firm for innovative ideas (Chesbrough and Spohrer, 2006; Eisenhardt and Santos, 2002; Laursen and Salter, 2006), it is important that firms tap one of the largest sources of such ideas – their own customer base. Many companies have successfully developed mechanisms that reward customers who provide useful ideas that lead to improvements in existing offerings or lead to new offerings altogether (Nambisan, 2002). These firms use a combination of monetary as well as non-monetary incentives to encourage the customers to engage in a dialog with the firm (Martin et al., 1999; Olson and Bakke, 2001). These incentives signal to the customers that the firm values their inputs, and reflect the value placed by the firm on the customer input. These incentives can positively influence the receipt of direct customer input for a firm (Sampson, 1999). This leads to the following proposition:

P2: Incentives offered to customers for providing input to the firm positively affect the receipt of direct customer input

Customer focus: An organization's concern for its customers is reflected in the policies and practices adopted by the firm. When the organization has a set of beliefs that puts the customers' interest first, the organization is said to be "customer oriented" or "customer focused" (Schneider et al., 1998). This customer focus drives the organization to determine

customer satisfaction with existing products and services, assess the current and emerging customer requirements and expectations, and provide effective customer relationship management (Evans and Lindsay, 2010; Samson and Terziovski, 1999). Firms that have a strong customer focus go to great lengths to ensure that they provide excellent service to their customers and meet or exceed customer expectations (Bowen et al., 1989; Kelley, 1992; Lytle et al., 1998; Schneider and Bowen, 1995; Schneider et al., 1992). These customer-centric policies can make the customers feel valued, and may make them more likely to engage with the firm. Therefore, customer focus may positively affect the receipt of direct customer input. This leads to the following proposition:

P3: Customer focus positively affects the receipt of direct customer input

Service focus: Service focus refers to an organization's commitment to delivering a quality service to the customer. This commitment is usually evident in "*the practices, procedures, and behaviors that get rewarded, supported, and expected with regards to delivering a quality service*" (Schneider et al., 1992 p. 705). Researchers have also used the term "service orientation" to denote such organization-wide embracement of a basic set of relatively enduring organizational policies, practices and procedures intended to support and reward service-giving behaviors that create and deliver "service excellence" (Bowen et al., 1989; Kelley, 1992; Lytle et al., 1998; Schneider and Bowen, 1995; Schneider et al., 1992). These policies, practices and procedures create the feel, predisposition or orientation of the whole organization (Deshpande et al., 1993; Lytle et al., 1998; Schneider and Bowen, 1993; Schneider et al., 1992) towards delivering a certain level of service to the customer, and ensure that any service failures are dealt with quickly and effectively (Halstead et al., 1993; Hart, 1988). One of the reasons that hold the customers back at times from contacting the firm is the uncertainty around whether the firm will take any action on the feedback provided (Tax and Brown, 1998). Sometimes, customers are not even sure whether their unmet expectations are rightly placed or not. This especially impacts negative feedback as the customer may have already had a bad experience, and the additional time and effort necessary to provide some input to the firm may make the customer worse off, if the firm does not take immediate and appropriate action on the feedback. Many service firms provide an explicit service guarantee to mitigate these issues (Halstead et al., 1993; Hart, 1988). Such a guarantee achieves two purposes. First, it clarifies the specific level of service that a customer can expect to get (and failing which, he can very well complain and get restitution from the firm) in minds of the customers as well as the firm employees. And second, it takes out the uncertainty around whether spending additional time and effort on providing an unsolicited input to the firm will produce any results or not as the service guarantees generally specify how the firm will compensate the customer when the firm is unable to deliver the level of service promised. When the firm shows such a commitment to providing an excellent service, and has policies and procedures for effectively recovering a service failure, the customers are more likely to choose the option of voicing their concern to the firm than to choose the option of leaving the firm (Fornell and Wernerfelt, 1987; Hirschman, 1970). This may positively impact the receipt of direct customer input for a firm. This leads to the following proposition:

P4: Service focus positively affects the receipt of direct customer input

Industry Clockspeed: Today's service firms face a very dynamic environment that is characterized by rapid change and heightened levels of competition (Bitner et al., 2000; de Brentani, 1995). Increased levels of deregulation in the service sector of many economies have

also fueled intense competition in many service industries that used to enjoy a rather protected territory (Alam and Perry, 2002). This pace of change within the industry and frequency with which the firms need to innovate have been characterized by a clockspeed that gauges the velocity of change in the external business environment and sets the pace of the firm's internal operations (Mendelson and Pillai, 1998; Mendelson and Pillai, 1999). Industries characterized by a high clockspeed witness more changes to the products and services than do those that are characterized by a low clockspeed. When customers have to frequently adapt to changing products and services, they may need to contact the firm more frequently than when they deal with the same product or service over a long period of time. The more the customers contact the firm, the higher the chance of them providing the input directly to the firm. Therefore, Industry Clockspeed may have a positive effect on the receipt of direct customer input by a firm. This leads to the following proposition:

P5: Industry clockspeed positively affects the receipt of direct customer input

Channels for customer input: There are many factors which discourage customers from voicing their dissatisfaction to the firm. According to Tax et al. (1998), some of these include the need to expend additional time and effort into an already dismal situation without any surety of a positive outcome, and the need to confront the same individuals who may have been responsible for the failure in the first place. A firm can provide a choice of channels to make it easy for the customers to provide unsolicited input (Hart et al., 1990; Tax and Brown, 1998). It has been shown that customers don't always give open, honest, and frequent feedback to the frontline staff (Voss et al., 2004). Availability of different channels can permit the customers to choose a method that is most convenient for them, and avoid confronting any specific part of the firm that the customer may not want to confront. Therefore, choice and availability of channels through which the customers can provide an input to the firm can have a positive impact on the receipt of direct customer input for a firm. This leads to the following proposition:

P6: Choice and availability of channels positively affect the receipt of direct customer input

4.3.2 Capture of direct customer input

The capture of unsolicited direct customer input in the context of services poses many challenges for the firm. While those who receive the Unsolicited Customer Input in-person can easily comprehend the context of the input, they may also be a part of the very same service delivery experience that drives the Unsolicited Customer Input. Given their involvement in service delivery, they are likely to suppress any negative input, and take personal credit for any positive input. On the other hand, those who receive the Unsolicited Customer Input through less rich mediums such as phone, email or letter, may find it difficult to form a complete picture of what actually transpired during the service experience that led to the Unsolicited Customer Input, as the evaluations of service encounters can be very subjective. Their inability to empathize with the customer may result in the loss of depth and breadth of input received from the customer. Together, these issues make comprehensive and distortion-free capture of Unsolicited Customer Input very challenging for the service firms. The following factors may influence an organization's ability to capture direct customer input:

Receipt of direct customer input: Receipt of direct customer input can be considered a necessary but not a sufficient condition for the capture of direct customer input. Unless an organization is able to engage the customers in a dialogue with the firm, the firm may not have much customer input to capture. Therefore, receipt of direct customer input may positively impact the capture of direct customer input for a firm. This leads to the following proposition:

P7: Receipt of direct customer input positively affects the capture of direct customer input

Customer focus: Firms that are customer-focused have an environment that puts customer interests ahead of other considerations. This focus could also drive the firm employees to fully capture customer input to ensure that various parts of the firm are able to understand the customers' needs, their level of satisfaction with current products and services, and any opportunity to better satisfy customer needs through changes in the existing products & services, or through the creation of new products and services. Therefore, customer focus may positively impact the capture of direct customer input. This leads to the following proposition:

P8: Customer focus positively affects the capture of direct customer input

Service focus: Service focus, as evidenced by the internal firm policies that commit the organization to provide a certain level of service to the customer, ensures that both the customers and the firm employees share the same expectation regarding the level of service that the customer can expect from the firm. Explicit service guarantees and corresponding service recovery policies necessitate the capture of Unsolicited Customer Input, especially when the input stems from a service encounter in which the firm was unable to provide the promised level of service to the customer. This may make the customer-facing service employees more open to understanding and capturing the input fully. Therefore, service focus may positively impact the capture of direct customer input. This leads to the following proposition:

P9: Service focus positively affects the capture of direct customer input

Formal process for capture: Since services have a large intangible component and require the customers' participation in service creation and delivery, interpretation of a specific service encounter can be quite subjective. So, when the customer provides unsolicited input to the firm based on a specific service encounter with the firm, the firm personnel receiving the input may not always interpret the service encounter in question in the same light. This may lead to a great deal of subjectivity in how the firm employees treat such input, including how much of it gets captured, and what details are captured by the firm employees that receive the input. If the firm has a formal process that specifies the steps the customer-facing personnel must follow in their interaction with the customer including how to deal with any input received, the treatment received by the customer's input across different firm personnel may become more uniform, and may make the capture of customer input more likely. This leads to the following proposition:

P10: Formal process for customer-facing firm personnel positively affects capture of direct customer input

Training for customer contact employee: For firms looking to leverage customer input to drive innovation, customer-facing firm personnel need to achieve dual goals: understand the customer concerns and take the necessary action to resolve the issue faced by the customer, and fully capture the input provided by the customer without judging it, trimming it, or filtering it. Many firms streamline the process that is followed by their customer-contact personnel to reduce the amount of time spent by the firm personnel on each customer contact. This includes providing the firm personnel with a set of pre-worded responses to the most frequently asked questions, commonly known as scripted answers (Victorino, 2008). While these answers usually speed up the process of responding to the routine customer queries, they make the employees unsure of what to do when the customer expresses a concern or provides an input that is not covered in their book of scripted answers. In addition, if there are significant cultural differences between the customers and the front-line staff, the interface may bear high friction losses. Therefore, there is no guarantee that the input provided by the customer is understood or articulated well (von Hippel and Katz, 2002). If the firm provides the customer contact personnel with specific training that shows them how to handle such off-the-cuff remarks, including what to ask for to clarify what the customer is trying to express, how to determine the level of priority, what customer details to record, and where to route such input to, it may have a strong positive impact on the capture of Unsolicited Customer Input received by the firm. This leads to the following proposition:

P11: Training for customer contact employee that prepares them for effectively capturing customer input positively affects the capture of direct customer input

Incentives available to the customer contact employees: Since a large proportion of the Unsolicited Customer Input is negative, many service firms tend to look at this input as a trigger for an issue that the firm needs to resolve for the customer. In fact, many studies have highlighted that service firms tend to focus only on customer recovery following a negative customer input resulting from a service failure (e.g. Johnston and Michel, 2008). If those that handle customer feedback have been given a narrow goal of only restituting the customer for the issue he or she has faced, they may not take the time to probe the customer further, even though this probing may lead to a richer input that could help the firm improve or innovate services in the future. Especially, if the incentives are not properly aligned for the firm personnel to involve and work together with the customers (Matting et al., 2004), firm employees may not be motivated to go beyond resolving the issue for the customer. If the firm incentivizes these employees to fully capture the input provided, the employees may be more likely to go beyond resolving the issue faced by a customer. This may positively impact the capture of direct customer input. This leads to the following proposition:

P12: Incentives that reward the customer contact employees to capture customer feedback positively affects the capture of direct customer input

Negativity in direct customer input: One of the barriers to a firm's ability to utilize Unsolicited Customer Input is the negativity that generally surrounds most of the unsolicited feedback. Unsolicited Customer Input can be a result of a customer experiencing delight or outrage (Rust and Oliver, 2000, Schneider and Bowen, 1999, Voss et al., 2004) following an excellent service experience or a service failure with the later more likely to be the case than the former (Temkin and Temkin, 2011). Especially for service firms, if those who receive negative feedback are part of the same service encounter that leads to this negative input, they may feel uneasy about recording or communicating the input further (Tax and Brown, 1998). Research suggests

that more negative the feedback, more suppressed is the transmission of the input (Fornell and Westbrook, 1984). This defensive organizational approach to complaint handling, labeled as "see no evil, hear no evil, speak no evil" (Homburg and Fürst, 2005), results in the employees treating the complaint as an isolated incident needing resolution but not requiring a report to management (Tax and Brown, 1998). The pervasive bias common to human communicators to encode (transmit) messages that are pleasant for the recipient, and to avoid those that are unpleasant (Rosen and Tesser, 1970; Tesser and Rosen, 1975) leads to such behavior. This bias impacts the firm's ability to receive, transmit and process negative information such as customer complaints. Therefore, we posit that negativity in direct customer input has a negative impact on the capture of direct customer input by a firm. This leads to the following proposition:

P13: Negativity in direct customer input has a negative impact on the capture of direct customer input

Tolerance of negative customer input: Even when the negative customer input is captured by the customer-facing firm employees, this information may be subjected to successive editing as it internally passes through the firm (Fornell and Westbrook, 1984; O'Reilly and Roberts, 1974; Read, 1962; Roberts and O'Reilly, 1974; Rosen and Tesser, 1970; Tesser and Rosen, 1975). These edits reflect the influences of those individuals that may be affected by the information (Fornell and Westbrook, 1984; March and Simon, 1958), and add to the loss of detail, closure, assimilation to expectation or attitude, and even distortion to please the receiver (Campbell, 1958). Many researchers report the existence of such an inverse relationship between message favorability and distortion. This results in the blockage or distortion of the message in upward communications from subordinates to superiors (O'Reilly and Roberts, 1974; Read, 1962; Roberts and O'Reilly, 1974). In addition, barriers to information transmission may also result from the reluctance of the message receivers to entertain certain types of messages (Fornell and Westbrook, 1984). This reluctance is described as a "defensive avoidance" (Janis and Mann, 1977), and is characterized by the tendency of an organization's executives to adopt cognitive defenses with respect to the threats to their current policy decisions. Matlin et al. (1978) proposed a theory to account for the reluctance of human beings to transmit adverse information and their tendency to exhibit defensive avoidance, as well as various other indications of human selectivity in perception, learning, cognition, attitudes, and language, in which pleasant or positively valued items are favored. Termed the "Pollyanna Principle," this theory asserts that pleasantness predominates in communication because pleasant items are processed more accurately and efficiently by human perceptual-cognitive structures (Fornell and Westbrook, 1984). An organization climate that is too competitive or not tolerant of negative information may make the employees unwilling to transmit or receive negative input for the fear of personal loss. On the other hand, if the organization's climate is supportive and open, and considers the negative input not as an opportunity to blame any part of the organization but as an opportunity to improve, the firm will generally have a greater chance of success in capturing the Unsolicited Customer Input without significant trimming or distortion (Fornell and Westbrook, 1984; March and Simon, 1958). Therefore, the tolerance of negative information may have a positive impact on the capture of direct customer input by a firm. This leads to the following proposition:

P14: Tolerance of negative customer input has a positive impact on the capture of direct customer input

Slack available to the customer contact employees: Capturing and communicating customer input can require a lot of efforts on the part of customer facing employees who are usually also responsible for the service delivery. If the organization works on a very tight timeline with little time to spare, the customer facing employees are likely to omit or reduce the time spent in capturing and communicating customer feedback even though probing the customer to get richer input can be beneficial for the entire firm in the long term. If the firm provides enough slack to its customer contact employees so that they can take the time necessary to probe the customer further, the employees may be more likely to go beyond resolving the issue faced by customer. This may positively impact the capture of direct customer input. This leads to the following proposition:

P15: Availability of slack that allows the customer contact employees the time necessary to probe the customer further positively affects the capture of direct customer input

4.3.3 Capture of indirect customer input

When the customer input is not given directly to the firm, but is expressed elsewhere, it adds to the challenges already described. These challenges relate to the ever-changing landscape of the medium, increased lack of focus, and the information being outside the firm boundary. The internet provides endless possibilities for the customers to express their opinions about services and service firms, including user forums, comparison and review sites, discussion boards and blogs among others. Termed “*internet input data repositories*” (Koca, Schouwenaar, and Brombacher, 2007) as well as “*virtual customer communities*” (VCCs) (Nambisan, 2002), these refer to both formal and informal web-based forums, where users share and exchange their questions, complaints, and general comments with their peers or with the service provider’s officials, by means of posting messages. Since these VCCs evolve all the time, it is fairly challenging for the firms to keep a track of relevant customer input expressed on these forums and discussion boards. It may also be difficult for the firm to screen relevant input from other discussions that may also be going on. As these repositories are compiled by users themselves who log their input without having to follow any codification or classification schemes, the resulting data is often quite unstructured and dispersed even though very rich in content (Koca and Brombacher, 2008). This lack of focus may also result in many of these forums lacking critical mass in terms of the number of new comments that are relevant for a firm. This may make it more effort-intensive for the firm to continuously monitor such forums. As most of these forums are independently hosted, the information is technically outside the firm boundary. While the firm can still manually scan the posts, the firm may not be able to do any systematic search or capture of such input. Also, since the input is not given directly to the firm, the firm may need to have a mechanism in place to capture this input from the external domain before it can attempt to utilize the input. The following factors may impact the capture of such indirect customer input by a firm.

Industry clockspeed: For the industries that experience a relatively slow pace of change, the products and services offered by the firms do not change that quickly. When the service is introduced for the first time, it may lead to a lot of direct as well as indirect customer input that the firm has to look at to ensure that the service is able to meet the needs of the customers as intended. After this initial period, there may not be much customer feedback regarding the service that the firm needs to worry about. On the other hand, industries characterized by a rapid pace of change require the customers to frequently adapt to changing products and services. This may generate an ongoing stream of direct and indirect customer

feedback that the firm must continually look at to stay competitive. So, the pace of change as measured by the industry clockspeed (Mendelson and Pillai, 1998; Mendelson and Pillai, 1999) may positively affect the need for a firm to keep a tab on the direct and indirect customer input, and therefore, positively impact the capture of such indirect customer input by a firm. This leads to the following proposition:

P16: Industry clockspeed positively affects the capture of indirect customer input

Customer focus: Customer focused firms give a priority to customer interests over other considerations. This focus on meeting customer needs is generally reflected in the policies and practices adopted by the firm that drive every part of the organization to work towards complete customer satisfaction. This may drive the firm to look at the customer input expressed elsewhere to assess the firm's ability to satisfy the needs of its current customers and identify the opportunities to innovate. These firms may actively look for and capture indirect customer input more frequently than do the firms that are not that customer focused. Therefore, customer focus may positively impact the capture of such indirect customer input by a firm. This leads to the following proposition:

P17: Customer focus positively affects the capture of indirect customer input

Service focus: Firms that are service focused generally adopt policies and procedures that commit the entire organization to provide a specific level of service to its customers, and make it clear to the customers as well as to the firm employees the level of customer expectations that the firm has explicitly committed to meet. While this service-centric attitude may result in more customers providing input directly to the firm, it may also drive the firm to look for customer input that is not provided directly to the firm to better understand its ability to meet its goal of providing excellent service to its customers. These firms may scan the environment looking for customer reviews, opinions, or ratings of its services, and record the specifics when it finds any feedback that requires firm action either through an improvement in the existing service, or through the introduction of a new service. Therefore, service focus may positively affect the capture of indirect customer input. This leads to the following proposition:

P18: Service focus positively affects the capture of indirect customer input.

Formal process, training, and incentives for indirect customer input capture: When the customer input is not given directly to the firm, the firm employees that are tasked with the goal of capturing it face a difficult task. To begin with, it can be fairly challenging for the firm employees to keep a track of relevant customer input expressed on the external forums and discussion boards given the ever-evolving nature of the medium. In addition, it may also be difficult for them to screen relevant input from the other discussions that may also be going on. As these repositories are compiled by users themselves who log their input without having to follow any codification or classification schemes, the resulting data is often quite unstructured and dispersed even though very rich in content (Koca and Brombacher, 2008). If the firm puts in place a formal process that these employees can follow, and provide relevant training to the employees concerned, many of these challenges can become less daunting. It can allow the employees to look at the indirect input in a systematic manner, reduce the amount of time spent by the team members in figuring out where to look, what to look for, and what to capture, and aid in the capture of relevant indirect input that may help the firm

innovate. In addition, properly aligned incentives can provide the necessary motivation that can drive these employees to think outside of the box and find more ways to scan a bigger proportion of the indirect customer input relevant for the firm. These considerations lead to the following three propositions:

P19: Formal process for relevant firm employees positively affects the capture of indirect customer input

P20: Training for relevant firm employees positively affects the capture of indirect customer input

P21: Properly aligned incentives positively affect the capture of indirect customer input

Negativity in indirect customer input: As shown by previous studies (e.g. Temkin and Temkin, 2011), customers are more likely to express their opinion regarding a firm's product or service by telling others than by telling the firm when the opinion is based on a negative service encounter. Generally, the firm employees looking for the customer input expressed elsewhere are different from the customer-facing employees of the firm that take part in the service delivery. Since these employees are not involved in the service encounter leading to the negative input, they don't face the conflict of interest that is faced by the service delivery employees. So, the negativity in the indirect customer input may not lead to any filtering by those who come across such input. It is widely established in the marketing literature that negative customer opinion in the public domain is more damaging than is the benefit generated by positive customer opinion in the public domain. This may actually make the firm specifically look for and capture the negative input. Therefore, negativity in the indirect customer input may positively affect the capture of such indirect customer input. This leads to the following proposition:

P22: Negativity in the indirect customer input positively affects the capture of indirect customer input

Indirect customer input facilitation: One of the challenges faced by a firm in collecting indirect customer input is the dispersed nature of such input. The input may be expressed through a variety of channels, may not always be in the public domain or visible for long enough time for the firm to get to it, and may relate to a wide variety of experiences a customer has had with multiple firms. This can make it very difficult for the firm to identify and capture relevant bits of customer input that are relevant for the firm. To reduce the complexity of tracking numerous sources that need to be scanned through periodically, to mitigate the issues of lack of focus and the absence of critical mass, and to overcome the external domain constraints, a firm may decide to facilitate the expression of such customer input by deploying a virtual customer environment that either exclusively or primarily focuses on specific service offerings of the firm. Nambisan (2002) examines the design of such virtual customer environments by focusing on four underlying theoretical themes such as the interaction pattern, knowledge creation, customer motivation, and virtual customer community-new product/service development team integration. It is argued that homophily (i.e., the degree to which pairs of individuals are alike in terms of certain attributes) between peer customers contributes to their effectiveness in understanding and appreciating the concerns of other customers and their particular usage problems—a critical success factor in product and service support (Brown and Reingen, 1987; Kay, 1999). These virtual customer environments facilitated by the

firm, such as discussion and message boards, can become a focal point for the firm's customers to post their positive or negative comments on the firm's products or services. The firm can choose to simply facilitate, or monitor as well as moderate the discussions and comments put up on such a forum. By providing a central place for the customers to raise and share their concerns with other customers of the same products or services and the firm, the firm may encourage expression of such input while allowing the firm to monitor and capture such input more easily. Therefore, indirect customer input facilitation through the provision of a virtual customer environment such as an online discussion / message board can positively impact the capture of indirect customer input by a firm. This leads to the following proposition:

P23: Indirect customer input facilitation positively affects the capture of indirect customer input

4.3.4 Customer input analysis and the usefulness of Unsolicited Customer Input insights:

Unsolicited Customer Input may contain a lot of incidence-specific comments apart from the insights that can help the firm improve current services or come up with new services. Therefore, this input may need to be analyzed to extract such insights from the input. Apart from the necessary condition of having a critical mass of direct and indirect customer input that is captured and available for analysis, the following factors may also affect a firm's ability to successfully analyze the customer input and obtain insights that can help the firm innovate:

Capture of direct and indirect customer input: Capture of direct and indirect customer input may be the necessary but not a sufficient condition for extracting insights useful for innovation. Unless there is a repository of customer input that is already captured and available for analysis, the firm personnel responsible for such analysis would not have much to go on with. This leads to the following two propositions:

P24: Capture of direct customer input may positively affect the extraction of insights useful for innovation

P25: Capture of indirect customer input may positively affect the extraction of insights useful for innovation

Formal process for customer input analysis: Since the input may or may not be applicable to any specific offering of the firm, those analyzing the Unsolicited Customer Input may need a broad brief that includes the capture of even those insights that do not relate to the current offerings or capabilities of the firm, else these equally valuable insights may get discarded right away. Especially, the firm employees that receive the customer input may be the ones that face the customer in the course of service delivery. They may not have the time or a broad enough view across all service offerings of the firm to analyze the input and capture insights that may be useful for future. Therefore, a formal process that makes a group of people specifically responsible for analyzing the customer inputs may prove to be helpful. This leads to the following proposition:

P26: A formal process for customer input analysis may positively affect the extraction of insights useful for innovation

Training, incentives, and slack available for customer input analysis: In addition, the lack of focus and resulting dispersed nature of the information contained in the unsolicited input may make the extraction of insights very effort-intensive for the firm. Unlike solicited input that is normally focused on specific issues or services, Unsolicited Customer Input does not follow any norms, structures or patterns, making it difficult for the firm to analyze (Koca and Brombacher, 2008). The insights obtained from the input can be highly dispersed, and may not relate solely to the current or planned set of offerings or capabilities of the firm. All of these add to the complexity of the task faced by those who are responsible for analyzing the customer input, and may require that these personnel are specially trained in customer input analysis (Johne and Storey, 1998), are incentivized to find useful insights (Benoy, 1996; Berry et al., 1994; Heskett et al., 1990; Lytle et al., 1998; Schlesinger and Heskett, 1991; Schneider and Bowen, 1993), and are given enough slack to sift through the voluminous records to understand the emerging customer trends, and to pick up the subtle hints of a gap between a firm's current offerings and the ever-evolving customer needs that can lead to the next innovation opportunity for the firm. Therefore, formal training, incentives, and slack available for customer input analysis may play an important role in the extraction of insights useful for innovation. These lead to the following three propositions:

P27: Training for firm personnel responsible for analyzing the customer input positively affects the extraction of insights useful for innovation

P28: Incentives for firm personnel responsible for analyzing the customer input positively affect the extraction of insights useful for innovation

P29: Slack available to firm personnel responsible for analyzing the customer input positively affects the extraction of insights useful for innovation

Suitably experienced personnel assigned to customer input analysis: Since Unsolicited Customer Input may not always relate closely to the specific service offerings or capabilities of the firm, these inputs face the risk of being discarded straight away unless the brief given to the firm personnel responsible for analyzing this input is broad enough that allows them to think beyond what the firm currently offers. Therefore, these employees need a broad understanding of the firm's current offerings and capabilities, as well as of the goals and the strategy to be employed for achieving these goals, to do a meaningful and thorough job. Therefore, it is vital that these employees are suitably experienced and have a way to keep themselves up-to-date with the evolving firm strategy. In other words, having suitably experienced personnel on the team that is responsible for analyzing customer input can be beneficial for the extraction of insights useful for innovation. This leads to the following proposition:

P30: Suitably experienced personnel on customer input analysis team positively affects the extraction of insights useful for innovation

Dissemination of insights obtained from the customer input across the firm: Unlike the Solicited Customer Input, the Unsolicited Customer Input is received as a result of a customer-initiated contact with the firm. Therefore, the insights that are obtained by analyzing the Unsolicited Customer Input do not have a predetermined purpose or a pre-designated part of the firm that needs to receive these insights. Based on the nature of the insight, the learning from the Unsolicited Customer Input can simultaneously drive many parts of the firm. This may

also include contacting the customer who provides the input in the first place for further probing, changes to the service value proposition or to the process through which the current service is delivered to the customers, and creation of new services that address the gap between current customer needs and the set of services currently offered by the firm. Therefore, a firm looking to fully leverage the benefits of analyzing Unsolicited Customer Input may need to ensure that the insights obtained from such an analysis are widely disseminated across the firm on a regular basis. Such regular and across-the-board dissemination of insights can increase the perceived importance of analyzing the Unsolicited Customer Input for those who are responsible for doing such analysis, and may positively affect the extraction of insights useful for innovation. This leads to the following proposition:

P31: Dissemination of the insights obtained from Unsolicited Customer Input across the firm positively affects the extraction of insights useful for innovation

Figures 4.1 – 4.4 capture these propositions that relate to the factors affecting a firm's receipt, capture and analysis of Unsolicited Customer Input.

4.4 Method

As quoted by Singleton et al. (1999) and Done (2005), Albert Einstein once said that “*science must start with facts and end with facts, no matter what theoretical structures it builds in between*”. The scientific process cycles through theories, predictions, observations and empirical generalizations. Theories generate predictions, predictions are checked against observations, the observations produce generalizations, and the generalizations support, contradict or suggest modifications to the theory (Done, 2005). Survey research methods have been well established and widely used in the OM field (Meredith, 1998; Roth and Jackson, 1995; Voss, Tsikriktsis, Funk, Yarrow, and Owen, 2005) to check predictions against observations. Although not free from limitations, these methods provide a powerful way to increase the validity and generalizability of theories derived from qualitative studies. We used a wide-scale survey of service firms to test the propositions outlined above.

Empirical research critically depends on good measurements, and good measurements require development of multi-item scales that are derived from theoretically relevant constructs (Churchill Jr, 1979; Hinkin, 1998; Menor and Roth, 2007). A researcher must determine clearly the constructs that need to be measured before selecting the relevant measurement items. These constructs must be motivated by theory and be grounded in practice. We motivated each construct based on our review of the existing literature, and then refined our definitions by involving industry experts from eight service firms that took part in a case study of NSD practices in service firms. Multi-item measurement scales were then developed for each of these constructs.

A multi-item scale must reduce measurement error by providing a more robust representation of a multi-faceted variable (Drolet and Morrison, 2001), and cover the construct domain with the desired reliability and validity (Menor and Roth, 2007). To achieve this, we followed the approach commonly used by empirical researchers (see Ahmad and Schroeder, 2003; Ahmed, Montagno, and Firenze, 1996; Alam, 2006b; Menor and Roth, 2007, 2008) and combined measurement items used in the existing literature with the measurement items developed specifically for this study. First, we identified potentially suitable measurement items that were cited in the current literature. We then created a supplemental pool of items that were

motivated by the existing literature, and were endorsed by senior industry executives that had the requisite domain knowledge in the area of customer involvement in NSD. These items were then subjected to three rounds of item-to-construct sorting exercises (Menor and Roth, 2008; Wacker, 2004) to assess inter-rater reliability, substantive validity and construct validity of measurement items. Finally, responses obtained from the service firm executives for a large-scale survey of service firms were used to measure the reliability and validity of each of the scales.

4.4.1 Item generation and item sorting analysis

We examined the extant literature from 1990 to 2010 to identify suitable measurement items. This included a review of article abstracts followed by an in-depth examination of relevant articles that allowed us to identify 99 potential items. We then eliminated items based on the lack of clarity, questionable relevance, and undesirable similarity to other items, ensuring that the items relate to a common construct and not just fall in a common category. We also tried to avoid exceptionally long items as they increase complexity and diminish clarity. The questions were also examined by a native as well as a non-native speaker of English for reading difficulty and the use of double negatives. Finally, any item identified as potentially double barreled (that conveys two or more ideas) was eliminated. The remaining items were then taken through three rounds of the item-to-construct sorting analysis to establish face validity and to ensure conciseness. While recently employed by some researchers (e.g. Menor and Roth, 2007), item-sorting has not been reported widely in the OM literature (Hensley, 1999). In the first round, the research team ($n=2$) involved in this study classified items based on the items' similarity with the definitions and descriptions of the underlying construct categories. In the second round, doctoral students and professors ($n=5$) were asked to carefully read the construct descriptions and match each item to a single dimension that they considered to be the best fit. Finally, a panel of industry experts ($n=20$) was asked to sort the items into the most relevant construct category for each item. They were also asked to evaluate each item's clarity and conciseness, and suggest new items if any. A total of 77 items were retained from this exercise. Given the fact that the items were either motivated by the existing research or were generated in consultation with industry experts, and were consistently placed by three different groups of raters into their postulated categories, the items retained are deemed to have shown adequate face validity (the extent to which the items seem to measure what they are supposed to measure). Content validity refers to the extent to which a measure represents all facets of a given social construct. Determination of content validity involves "*the systematic examination of the test content to determine whether it covers a representative sample of the behavior domain to be measured*" (Anastasi & Urbina, 1997 p. 114). Content validity for the items retained was established by the fact that these items cover a representative sample of the facets of the underlying constructs suggested by the existing literature as well as the industry experts knowledgeable about NSD practices in their respective firms. To further assess scale reliability and validity (including construct validity and criterion validity), we utilized the responses received from the service firm executives through a large-scale survey of service firms.

4.4.2 Survey Instrument

The data used for this study was part of a broader and more comprehensive survey that dealt with both the process-related and the outcome-related factors that influence the utilization of Unsolicited Customer Input in NSD activities. The questions were divided into sections that

focused on firm environment (competition, innovation, and customers), direct customer feedback, indirect customer feedback, analysis of customer feedback, utilization of customer feedback in NSD, firm demographics, and respondent demographics. Except for the demographics questions, all other questions asked the respondents to rate the statements on a 7-point Likert scale, and were required to be answered. Some items were reverse-coded to avoid an acquiescence, affirmation or agreement bias (this bias refers to the respondents' tendency to agree with statements regardless of their content). However, such use was kept to a minimum since the reversals in the item polarity can become confusing to the respondents, especially when they are completing a long questionnaire such as this (Blunch, 2008). The polarity reversals are known to confuse the respondents between expressing their strength of agreement with a statement regardless of how it is worded, and expressing the strength of the underlying construct or attribute being measured. As a result, the correlations of the reverse-coded items with the other non-reverse coded items may diminish or become negative altogether for the entire sample. The total length of the questionnaire was another concern since very long questionnaires are known to cause issues such as the respondents' refusal to participate, skipping some of the questions, or filling out the questionnaire more or less at random in order to get the job done as quickly as possible. A common criticism of scale constructors is that in their efforts to obtain perfection, they often end up with scales that are too long for practical use (DeVellis, 2003). We capped the number of questions (measurement items) per construct in order to prevent the survey from becoming too long while ensuring that it still covers the entire spectrum of firm practices related to the firm's use of Unsolicited Customer Input in NSD. The survey instrument (including the directions given to the respondents and the questions asked) can be found in Appendix 5.

4.4.3 Sample and data collection

These items were administered to a large sample of service firms, and the measurement reliability and validity were confirmed by analyzing these survey responses. The sampling frame consisted of 3500 B2B and B2C service firms located across industries and continents, and ranged in size from small (annual turnover less than £10 million) to large (annual turnover greater than £200 million). Hence our results should apply to a broad spectrum of industries, firm sizes, and countries. The unit of analysis in this research is the firm's NSD activities, defined as the collective direction taken and the outcomes achieved by the portfolio of NSD projects of the organization over the last three to six years. For each firm, we sought a key informant – generally at the top management level, who can answer questions pertaining to the firm's broad strategy of involving customers in NSD efforts, and also help us in getting input from the customer support and the NSD functions within the firm. These key informants were initially contacted by email and then by post to solicit their participation in the study. The survey instrument was attached to the invite to give the participants an opportunity to examine the questions beforehand and identify appropriate individuals within their firms who can knowledgeably answer relevant sections. The respondents were given a choice of completing the survey on paper, by email, or through an online survey platform that allowed the respondents to save their partial responses and come back later. Generic email reminders were sent one week, two weeks, and four weeks after the initial invite to those who had not responded so far, and a personalized request for completion was sent five weeks after the initial invite to those who had partially completed the online survey by then. We received a total of 561 responses, out of which 402 responses were found usable. The remaining responses consisted of responses that were completed too quickly (raising the suspicion that the respondents may have just tried to get over with the survey without paying attention to the questions), duplicate responses by the same respondents, and responses that were

incomplete; and were deleted after conducting appropriate statistical checks. The 402 usable responses include 4 responses received by email, 48 responses received by paper, and 350 responses received through the online survey platform, representing a 11.5% response rate. For the usable responses, non-response bias was assessed through a comparison of early and late responses on firm variables such as firm size (defined by the annual revenue, and the number of employees) and NSD process and outcome variables in terms of mean and variance (Armstrong and Overton, 1977; Moore and Tarnai, 2002). Similarly, we also assessed method-of-response (email / paper / online) bias. No statistically significant differences were detected.

4.4.4 Reliability and validity analysis

Exploratory Factor Analysis (EFA), and Confirmatory Factor Analysis (CFA) were then performed to assess uni-dimensionality and to measure the reliability as well as the validity of each multi-item scale (Ahire and Devaraj, 2001; O'Leary-Kelly and J Vokurka, 1998).

4.4.4.1 Reliability and Validity

Scale reliability is the proportion of variance attributable to the true score of the latent variable. Two important facets of scale reliability include the internal consistency reliability and the temporal stability reliability. Scale validity analysis includes an assessment of face validity, construct validity, convergent and discriminant validity, and consequential validity.

Internal consistency reliability is concerned with the homogeneity of the items within a scale. Scales based on classic measurement models are intended to measure a single phenomenon. Measurement theory suggests that the relationships among items are logically connected to the relationships of the items to the latent variable. If the items of a scale have a strong relationship to their latent variable, they will have a strong relationship to one another. A scale is internally consistent to the extent that its items are highly intercorrelated. Internal consistency is typically equated with Cronbach's (1951) coefficient alpha.

Temporal stability reliability refers to the extent to which the scores remain constant from one occasion to another. Test-retest reliability is the method typically used to assess this. Correlation of scores obtained across two administrations of a scale to the same individuals should represent the extent to which the latent variable determines the observed scores. Nunnally (1978) pointed out that characteristics of the items might cause them to yield temporally stable responses even when the construct of interest has changed. Kelly and McGrath (1988) identified four factors that are confounded when one examines two sets of scores on the same measure, separated in time. These include real change in the construct of interest, systematic oscillations in the phenomenon, changes attributable to differences in subjects or measurement methods, and temporal instability due to the inherent unreliability of the measurements. Only the fourth one is unreliability. Although multi-trait, multi-method matrix approach can help, it is argued that it may never be possible to unconfound these factors fully (DeVellis, 2003).

4.4.4.2 Exploratory Factor Analysis

Principal Component Analysis (PCA) using maximum likelihood estimation was performed for each latent construct. While it would have been more correct to use factor analysis instead of

component analysis, component analysis was preferred here because in most situations, component analysis and factor analysis give nearly identical solutions; and estimation methods available for factor analysis are often unsatisfactory when the calculation of a score is required (Blunch, 2008).

If a number of items make up a reliable summated scale, a component analysis should show that the first (un-rotated) component accounts for a large share of the total variance in the items, and each of the following components accounts for a very small share of the total variance. The communality is the part of the variance of a measurement that it has in common with the latent variable it is supposed to measure, and should therefore also be high, ideally greater than 0.6. When the items are factor analyzed, the initial premise is that a single factor (i.e. the latent construct) can adequately account for the pattern of correlations among the items. This amounts to a provisional assertion that a model that has a single latent variable (i.e. a single factor), with a separate path emanating from it to each of the items, is an accurate representation of the underlying causal relationships.

In factor analysis, determining how many factors to extract can be a knotty issue (Zwick and Velicer, 1986). Two widely used non-statistical guidelines for judging when enough number of factors have been extracted are the eigenvalue rule (Kaiser, 1960), and the scree test (Cattell, 1966). According to the eigenvalue rule, factors with eigenvalues less than 1.0 (and therefore, containing less information than the average item) should not be retained. According to the scree test rule, factors that lie above the elbow should be retained (done by plotting eigenvalues of factors on a graph in a descending order, and then determining where the graph goes from relatively vertical to relatively flat). For each multi-item scale, both of these tests were used to confirm that only one factor should be extracted for each measurement scale, indicating the unidimensionality of the scales. After confirming the unidimensionality, internal reliability of the scale was calculated by measuring the Cronbach's alpha. A value of 0.7 or more for the Cronbach's alpha was used as a criterion for a reliable scale (Nunnally, 1978). Table 4.1 shows various measures of the scale reliability as described above.

4.4.4.3 Confirmatory factor analysis:

Since exploratory factor analysis has known limitations (large Cronbach's alpha no guarantee for uni-dimensionality of the scale, every manifest variable connected with every latent variable, limited possibilities for statistical testing), we also subjected our data to confirmatory factor analysis. Prior to performing confirmatory factor analysis, all of the items were further analyzed for violations of multivariate normality and kurtosis (West, Finch, and Curran, 1995); no violations were detected. Confirmatory factor analysis was then performed to further assess scale unidimensionality, reliability, and validity. Measurement models of each multi-item scale were constructed and estimated while allowing the errors to freely correlate with each other (see table 4.2 for a listing of the fit indices for each of the scales). All chi-square values were non-significant, indicating that the measurement models are consistent with the data and show acceptable overall goodness of fit. Since the exclusive use of chi-square statistic in evaluating overall model fit is considered problematic by many researchers (Bentler and Bonett, 1980; Bollen and Long, 1993; Jöreskog and Sörbom, 1993; Kenny and McCoach, 2003; MacCallum, 1990; McIntosh, 2007), we also looked at other absolute as well as incremental goodness-of-fit (GOF) measures. As shown in table 4.2, all of these fit indices for each of the multi-item scales were higher than 0.9, indicating the scale unidimensionality by generally accepted standards. We then computed the reliability and convergent validity of each multi-item scale by computing composite reliability and average variance extracted (AVE) measures.

Composite reliability is calculated by using the standardized factor loadings of the construct on each of the items (see table 4.3), and a value of 0.7 or above indicates acceptable scale reliability (Bagozzi and Yi, 1988). All (except two, which are above 0.6) of the composite reliability values exceeded the recommended threshold of 0.70, indicating that these items sufficiently represent their respective constructs. AVE (Fornell and Larcker, 1981) is a measure of the error-free variance of a set of items, and is used as a measure of convergent validity (Dillon and Goldstein, 1984). All (except five, which are very close to, but slightly lower than 0.5) of the AVE values exceeded the 0.50 standard, indicating that more than half of the variance in the items is captured by each construct (as opposed to the measurement error).

We assessed convergent validity by examining the magnitude and sign of the factor loadings of the items (see table 4.3). All of the standardized loadings are in the anticipated direction, and are statistically significant at $p < 0.01$.

Discriminant validity of the multi-item scales was assessed in three ways – the chi-square difference test, the variance extracted test, and the confidence interval test. First, we estimated 190 (95 constrained, and 95 unconstrained) models, and conducted 95 chi-square difference tests of nested models (see tables 4.4a – 4.4d). This involved running confirmatory factor analysis (CFA) on pairs of constructs. For the unconstrained models, the latent factors were allowed to correlate freely whereas for the constrained model, the latent factors were constrained to have a correlation of one. χ^2 differences for 70 out of the 95 pairs are statistically significant, indicating that the proposed scales capture unique constructs. We address the discriminant validity of the remaining pairs by conducting two other checks described below.

In the second step, we compared the average variance extracted (AVE) value for each construct with the square of its unconstrained correlation with each of the remaining constructs. As shown in tables 4.5a - 4.5d, the AVE value for each construct (barring two constructs) is higher than the unconstrained correlation of that factor with each of the other factors, showing that the variance extracted by the latent construct is higher than what can be attributed to other correlated constructs. This indicates that each particular construct is distinct from each of the other constructs, and establishes its discriminant validity (Fornell and Larcker, 1981; Netemeyer, Johnston, and Burton, 1990).

Finally, we performed a confidence interval test for each possible pair of latent factors to further assess the discriminant validity of factors. We calculated confidence intervals of plus or minus 2 standard errors around the correlation between each factor pair, and checked whether this interval includes +/-1.0. None of the 95 confidence intervals except 7 includes 1.0, demonstrating discriminant validity for these latent factors (Anderson and Gerbing, 1988; Hatcher, 1994). Together, these tests provide strong support for the discriminant validity of most of the factors, and mixed support for the discriminant validity of two factors ("Formal process for indirect customer input capture" and "Dissemination of customer input across the firm"). As argued by Hatcher (1994), a model's fit need not meet all of the criteria in order to be deemed acceptable since these characteristics represent an ideal that very often can't be attained with real-world data even when the measurement model is quite good.

To establish convergent, divergent, and construct validity, we also looked at the unconstrained correlations of latent factor pairs (table 4.6a – 4.6d). If factors are convergent valid, there should be good correlation between the constructs that are theoretically connected. Divergent validity dictates that the constructs that are not theoretically connected should show very little correlation. Construct validity requires that the direction of movement for each latent

construct is in line with the expected movement of the latent variable to the movement in other variables. As shown in tables 4.6a – 4.6d, all of the constructs show good convergent, divergent, and construct validity. For example, “Customer Focus” is strongly correlated with “Service Focus” and “Channels for customer contact” as expected, establishing convergent validity. Non-significant correlation between “Industry Clockspeed” and “Customer contact frequency” indicates divergent validity. Statistically significant and strong correlation between “Customer Focus” and “Receipt of direct customer input” shows construct validity.

Consequential validity (Messick, 1995) was established by ensuring that the respondents did not feel compelled to choose the answer to the survey questions by considering how the resulting response would make their firms look in the eyes of the researchers, firm stakeholders, and those who access this research later on. This was done in two ways. First of all, all respondents were assured that the respondent and the firm identity would not be disclosed to anyone outside of the team involved with the research. Second, particular attention was paid to the wording of the questions to ensure that the questions did not lead the respondent to choose a specific response.

This analysis led to the retention of 22 multi-item measurement scales consisting of 59 items. A brief description of the items along with a representative list of existing literature that motivated the items can be found in Appendix 3. Figures 4.5 – 4.8 show the resulting research models.

4.5 Data Analysis

Data were analyzed using the Structural Equation Modeling (SEM) technique using a total disaggregation approach which treats each item as a separate indicator of the relevant construct (Bagozzi and Edwards, 1998; Marsh and Hocevar, 1985). The models tested were covariance structure models with multiple indicators for the latent constructs. The analysis followed a two-step procedure based in part on an approach recommended by Anderson and Gerbing (1988). In the first step, confirmatory factor analysis was used to develop individual measurement models that demonstrated an acceptable fit to the data. In path analysis with latent variables, a measurement model describes the nature of the relationship between a number of latent variables (or factors) and the manifest indicator variables that measure those latent variables. A measurement model is equivalent to a confirmatory factor analysis model in which each latent construct is allowed to covary with every other latent construct. The measurement models were estimated using the maximum likelihood method. In the second step, the measurement models were modified so that they came to represent the theoretical models of interest. These theoretical models were then tested and revised until theoretically meaningful and statistically acceptable models were found. The following sections describe the SEM analysis done using SPSS' AMOS, including the tests of statistical assumptions, model identification, and outcomes achieved.

4.5.1 Statistical Assumptions

While 350 out of the 402 total survey responses were received through the online survey platform which required the respondent to answer every question, remaining 52 responses were received through email / post that allowed the respondents to skip questions at their will. This resulted in a dataset with missing data for a small number of responses. Faced with the choice of either excluding the incomplete responses from the analysis or using an

estimation method that can handle missing data, we chose the latter since excluding the incomplete responses would have resulted in a smaller sample, and would have decreased the power of the statistical tests.

Unlike Listwise Deletion (LD) that reduces the sample size, Pairwise Deletion (PD) that results in different measures based on different samples, Mean Imputation (MI) that reduces the variance, and Regression Imputation (RI) that estimate the value of the missing observation by regressing the variable on all other variables, Full Information Maximum Likelihood (FIML) estimation method uses all available information, and is therefore statistically the most efficient method. However, FIML estimation necessitates estimation of means and intercepts and eats up degrees of freedom. Therefore, the measurement model and the causal model cannot be estimated at the same time. While FIML gives unbiased estimates only when the data are Missing Completely At Random (MCAR) – i.e. the probability that a value is missing is independent of one and every variable measured or missing (Rubin, 1976), it still gives efficient and consistent estimates even when the data are Missing at Random (MAR) – i.e. the probability that a measurement is missing is independent of its value, conditional on the values of the measured variables. If the MAR condition is not met, FIML estimation may not be consistent, but is still less biased than the other solutions to the missing data problem.

Also, the Maximum Likelihood estimation is based on an assumption of multivariate normality of the manifest variables. If this assumption is not met, consequences include convergence problems, underestimation of the variance, inflation of the χ^2 statistic, upward bias in critical values used in determining significance (West et al., 1995), and an underestimation of the standard errors of parameter estimates (Blunch, 2008). However, this risk is reduced with a large sample ($n>200$) (Tabachnick and Fidell, 2007). Normality is also important for the generalizability of results beyond the sample used. Even though our sample size is large ($n=402$), we decided to examine the univariate normality of the variables in order to rule out the possibility of an issue with the multivariate normality assumption. As shown in table 4.7, none of the items exhibits skewness or kurtosis values in excess of |2|, and therefore, do not pose a threat to the assumption of multivariate normality.

4.5.2 Model Identification

Structural Equation Modeling analysis is based on covariance matrices. Therefore, it is important to assess model identification of the hypothesized model to ensure that the model as specified has a unique solution. This requires the existence of at least one unique equation for the estimation of each path coefficient (Bollen, 1989) - i.e. the number of pieces of information shall be at least as large as the number of parameters to be estimated (also called the T-rule). This is usually done in two steps, and hence the name – two-step identification rule (Anderson and Gerbing, 1988). First, the measurement model (where the latent factors are allowed to load on indicator variables, and the latent factors are allowed to correlate among one another) is identified, and then, identification of the structural model (where the latent factors are causally connected) is established. This two-step rule is sufficient (although not necessary) to establish model identification (Bollen, 1989).

To assess model identification for the measurement models (i.e. confirmatory factor models), we used the three-indicator rule as well as the two-indicator rule (both sufficient, but not necessary) in addition to satisfying the usual requirements such as all latent variables must have assigned a scale, and checking that the model is not empirically under-identified (Blunch, 2008; Tabachnick and Fidell, 2007). We also applied the commonly suggested way to fix the

one indicator problem for a very small number of latent constructs that have only one indicator each. Then, we identified the structural models using the null B rule that states that a model in which no endogenous variable affects any other endogenous variable is always identified (Bollen, 1989).

4.5.3 Model Evaluation

In Structural Equation Modeling, the null hypothesis states that the model is true, and the alternate hypothesis states that it is not. So, we do not want to reject the null hypothesis here. Initial estimations of the proposed models showed that the data only partially supported these models (i.e. the null was rejected). The pattern of large normalized residuals, parameter significance tests, and AMOS modification indices (not exactly the same as the Lagrange multiplier tests, but serving identical purpose) also indicated a poor fit between the model and the data, and required the models to be modified. While models may be modified in a number of ways, they are most frequently modified either by eliminating a non-significant path from the model or by adding new paths to the model. Of the two, eliminating a non-significant path is less likely to capitalize on chance characteristics of the data, and is therefore less risky (Bentler and Chou, 1987; Hatcher, 1994). Therefore, a careful re-examination of the proposed models was done and alternate model specifications were estimated by removing one parameter at a time from the originally proposed models. For each modification performed, a compelling theoretical argument was considered to avoid the dangers of data-driven model modifications such as introducing changes that capitalize on the chance characteristics of the sample data and create a new model that does not generalize to other samples.

The modification indices calculated by AMOS were used to prioritize among alternate model specifications. AMOS calculates these modification indices only for complete data. Therefore, we conducted the analysis in two stages. In the first stage, we estimated alternate model specifications by using the ML estimation method with complete data until a model specification achieved an acceptable fit. Since each alternate specification was nested under the original specification, we were able to use the chi-square difference test to determine whether removing a path significantly improved the model fit or not. Then, we validated that specification using the entire dataset by going back to the FIML estimation method. Fit measures are measures of the average fit of the model to the data. Even if this ‘general’ fit seems to be OK, the model could still have a bad fit in local places. So, we also checked standard errors of various parameters and coefficients of determination. We also paid particular attention to the residual covariance matrix in raw and standardized forms to ensure that none of the residuals are large, which would have required additional parameters to be estimated. Specifically, we checked that relatively few (or no) normalized residuals exceed 2.0 in absolute value. Final specifications of the models along with respective fit measures are presented in section 4.6.

4.6 Results

The goal of structural modeling analysis is to reach parsimonious models that give satisfactory description of the data with as few parameters as possible, while being theoretically sound and substantively meaningful. Broadly, the measures of model fit obtained for the measurement models and the theoretical models suggest a very good fit, and indicate that this goal was achieved.

The measurement models:

The χ^2 statistic is non-significant for the second, third, and fourth model. While non-significant χ^2 indicates a good fit between the model specified and the data, the sole use of χ^2 statistic to assess model fit is considered problematic. The test may not discriminate between good fitting models and poor fitting models due to lack of power at small sample size (Kenny and McCoach, 2003), and may almost always reject the null at large sample size since a sharp null hypothesis is tested against a diffuse alternative (Bentler and Bonett, 1980; Jöreskog and Sörbom, 1993). Non-normality in the underlying distribution of the input variables can also result in the rejection of an otherwise properly specified model (Bollen and Long, 1993; McIntosh, 2007). Therefore, we also report other measures of model fit including absolute fit measures such as the relative/normed chi-square (χ^2/df) (Wheaton, Muthén, Alwin, and Summers, 1977), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI) (Jöreskog and Sörbom, 1993), and Standardized Root Mean-square Residual (RMR); relative fit measures such as Normed Fit Index (NFI) (Bentler and Bonett, 1980), Tucker-Lewis Index (TLI) (Tucker and Lewis, 1973), Incremental Fit Index (IFI), and Comparative Fit Index (CFI) (Bentler, 1990); and fit measures based on the non-central χ^2 distribution such as Root Mean Square Error of Approximation (RMSEA) (Hu and Bentler, 1999). The fit indices are at or above their threshold values - χ^2/df is less than two (Tabachnick and Fidell, 2007); NFI, TLI, CFI, IFI, GFI are all greater than 0.9 (>0.95 in most cases) (Hu and Bentler, 1999); RMR is 0.05 or less (Byrne, 1998; Diamantopoulos, Siguaw, and Siguaw, 2000); and RMSEA values are 0.04, 0.05, and 0.06, which are equal to or below the stringent cutoff value of 0.06 (Hu and Bentler, 1999). The measurement model loadings for all four models show that all of the factor loadings are statistically significant (table 4.3), and are in the anticipated direction. As reported in table 4.3, the composite reliability and the average variance extracted values also exceed the recommended thresholds for almost all of the factors, indicating acceptable scale reliability. A quick check on the standardized residuals confirmed that each indicator variable is indeed unifactorial given the absence of large positive and / or negative residual covariance values between manifest variables that load on different latent factors (Hatcher, 1994). Collectively, this suggests that the measurement models provide an excellent fit to the data, have no non-significant factor loadings or large normalized residuals, and exhibit acceptable reliability and validity. Table 4.8 shows various fit measures for all four measurement models:

The theoretical models:

Fit indices, factor loadings, and path coefficients for the theoretical models are shown in figures 4.9 – 4.12 respectively, and are all well above / below their relevant thresholds. Specifically, the chi-square/df ratio is less than 2; NFI, TLI, CFI, IFI, GFI are all greater than 0.9 (most of them are >0.95); Standardized RMR values are less than or equal to 0.5; RMSEA values are less than or equal to 0.06; the absolute value of the t-statistic for each factor loading and path coefficient exceeds 1.96; the standardized factor loadings are non-trivial in size (>0.05); the R^2 values for the latent endogenous variables are relatively large; normalized residuals are symmetrically distributed around and centered on zero and do not exceed 2.0 in absolute value; and the chi-square difference test shows no significant difference between the theoretical model and the measurement model.

The chi-square difference test comparing the theoretical (i.e. full) model to the measurement model for each of the four models found no significant difference (see table 9) at $p = 0.05$ level. This also provides support for the nomological validity of the theoretical model

(Anderson and Gerbing, 1988; Hatcher, 1994). As estimated, these models form the basis for testing the hypotheses. Next, we focus on examining the estimated coefficients for each of the hypotheses, and discuss their practical and theoretical implications.

Our first set of hypotheses (H1-H6) focus on the factors that impact the receipt of direct customer input. The estimated model shows that three out of the six hypothesized latent variable relationships are statistically significant (see table 4.10 for standardized estimates and critical ratios) and nontrivial in size. Specifically, the empirical analysis shows that “Customer contact frequency”, “Customer focus”, and “Incentives for customers” have strong and statistically significant positive impact on “Receipt of direct customer input”. Contrary to the initial expectation, “Service focus”, “Industry clockspeed”, and “Channels for customer contact” do not seem to have a statistically significant impact on the “Receipt of direct customer input”.

Our next set of hypotheses (H7-H15) focus on the factors that impact the capture of direct customer input. As shown by the estimated model, only four factors - “Service focus”, “Tolerance of negative customer input”, “Slack available for direct customer input capture”, and “Incentives for customer contact employee” have a strong and statistically significant impact on the “Capture of direct customer input”. As expected, there are strong and statistically significant correlations among these four factors that collectively reflect an organizational climate that facilitates the capture of direct customer input (see table 4.10 for standardized estimates and critical ratios).

Hypotheses H16-H23 focus on the factors that impact the capture of indirect customer input. The estimated model shows that only “Training for indirect customer input capture” and “Incentives for indirect customer input capture” have a statistically significant and strong positive impact on the “Capture of indirect customer input”. Through its strong and significant correlations with “Training for indirect customer input capture” and “Incentives for customer input capture”, “Customer focus” shows a strong indirect effect although it does not have a direct impact on the “Capture of indirect customer input”.

Our last set of hypotheses (H24-H31) focus on the factors that impact the extraction of innovation-driving insights through customer input analysis. “Dissemination of customer-input-based insights across the firm” shows a positive effect and “Formal process for customer input analysis” shows a negative effect on the extraction of innovation driving insights through customer input analysis. While the “Capture of direct customer input” and “Slack available for customer input analysis” show strong positive correlations with these two factors, they do not have a direct effect on the extraction of innovation driving insights through customer input analysis.

Given that all of the survey data were collected through a single survey instrument, common-method bias may potentially pose an issue in interpreting these results. For example, it can be argued that the firms that indicated a higher level of customer focus may have also reported higher levels of direct and indirect customer input receipt and capture. However, a multitude of factors lead us to believe that the results obtained are not affected by the common-method bias. First of all, the survey was completed by multiple respondents from each participant firm. Input was solicited from three different parts of the firm – the customer care function, the NSD function, and the top management team. To allow each part of the firm to complete the relevant questions and then forward the survey to the next respondent within the firm, the survey was designed in a way that segmented the questions by the department that would be in the best position to answer these questions. So, the questions that focused on the receipt

and capture of customer input were answered by a different set of respondents than those who answered questions that asked about the extraction of innovation-driving insights through the analysis of customer input. While these questions were answered by specific departments within the firm, a member / members of the top management team at each participating firm answered the questions regarding the performance of the firm's NSD portfolio, customer focus within the firm, industry clockspeed etc. Therefore, even though the responses were collected through a single survey instrument, the responses have not come from single key informants. Second, we tested a few hypotheses that could not have been refuted if the results were driven by a common-method bias. These were H6 (availability of channels for the customer to contact the firm driving the receipt of direct customer input), H8 (customer focus leading to capture of direct customer input), H10-11 (formal process and training for customer contact employee positively affecting capture of direct customer input), H19 (formal process for indirect customer input capture positively affecting capture of indirect customer input), and H27-28 (training and incentives for customer input analysis positively affecting extraction of innovation-driving insights). However, the data does not support these hypotheses, diminishing the possibility of any common-method bias affecting the results.

4.7 Discussion

Our analysis of survey data collected from a sample of service firms shades a lot of light on the under-researched role of Unsolicited Customer Input in NSD. This analysis examined the factors that affect an organization's ability to obtain innovation-driving insights from the Unsolicited Customer Input through receipt, capture and analysis of direct as well as indirect customer input. As our data shows, pace of change within an industry (i.e. Industry clockspeed) does not seem to affect any of the steps involved in this process, even though one would expect that the firms that need to innovate more frequently would be more inclined to leverage various sources of ideas for innovation. As highlighted in previous research, many firms may be missing out on this opportunity to innovate using Unsolicited Customer Input partly because of a lack of understanding of the factors that impact the firm's ability to successfully leverage Unsolicited Customer Input in the NSD context (Johnston and Michel, 2008; Miller et al., 2000; Roth and Menor, 2003; Zhu et al., 2004). While the Unsolicited Customer Input can help the firms innovate (Fornell, 1976; Goodman, 1999; Voss et al., 2004), availability of such input alone does not allow the firms to benefit from this valuable source of innovation. As shown by our four models, firms need to create an environment in the firm that is conducive to customer-driven innovation, and carefully manage the path taken by the Unsolicited Customer Input within the firm.

To begin with, a firm needs to ensure that it receives adequate amount of customer input. As more and more service firms look for ways to provide customized services to a wide range of customers at a lower cost through technology-mediated self-service mechanisms, firms risk losing the touch with their customers. As shown by the first model, customer contact frequency as dictated by the service design is one of the factors that have a strong and positive effect on the receipt of direct customer input. Equally important for the receipt of direct customer input is the provision of suitable monetary and / or non-monetary incentives for the customers that take the time and effort to provide valuable feedback to the firm. While both of these factors are important, the extent to which an organization is customer-focused is the most important factor that affects the receipt of direct customer input. Collectively, these factors have a strong positive effect on the receipt of direct customer input by a firm. While service-focused firms may be able to assure a specified service level for their customers through their explicit policies around service guarantee and service recovery, the survey data

shows that service focus does not have a statistically significant impact on the receipt of direct customer input for a firm. The data also shows that providing customers with a choice of channels to get in touch with the firm does not automatically affect the receipt of customer input unless the service is designed to encourage the customers to interact with the firm, customers are incentivized to provide input to the firm, and firm is customer focused.

After an organization ensures that it receives a lot of direct customer input, it needs to ensure that this input is captured by those who receive the input. While customer focus encourages the customers to provide input to the firm, it does not have a statistically significant impact on the capture of such input by the firm employees. On the other hand, although service focus does not directly impact the receipt of direct customer input, it does have a strong effect on the capture of such input that is received by the firm. If the organization has a specific set of service guarantees and service recovery policies in place, it ensures that everyone involved, from customers to firm employees, has the same expectation of the service that the firm is committed to deliver. This may make it easier for the firm employees to record customer input even when it is negative since the service experienced by the customer is deemed to be below the established norm. Service focus is strongly correlated with a tolerance of negative customer input, which also has a statistically significant positive effect on the capture of direct customer input. Surprisingly, the actual level of negativity found in the customer input received by the firm does not seem to have a strong effect on the capture of customer input even though the tolerance of negative customer input does have a positive effect on the capture of customer input. A firm that has a tolerant environment that takes the negative input as an opportunity to learn and improve rather than something that needs to be avoided or ignored, may encourage the firm personnel to record customer input regardless of the level of negativity. This may create a virtuous loop for the firm – the more appreciation the firm shows to the customer contact employees for bringing the issues faced by the customers to the firm's attention, the more these employees consider capturing customer input a valuable part of their job, and the more they capture such input. A formal process and training for the customer contact employees do not seem to have a discernible effect on the capture of direct customer input, but the incentives that encourage the customer contact employees to capture customer input and the slack available for such input capture do have a strong and significant impact on the capture of direct customer input. Firms that look at their customer contact operations simply as a cost center and try to implement measures that require the customer contact employees to reduce the amount of time spent on each instance of customer contact may find it very difficult to leverage customer input in driving their innovation efforts since such measures greatly reduce the slack available for customer input capture, and disincentivize the employees from going into additional details when customers contact the firm. Even though the receipt of customer input is a necessary condition for the capture of customer input, our model refutes the hypothesis that receipt of customer input is one of the drivers of customer input capture. This result shows that the firms that value customer input can't simply take solace in the fact that many customers provide input to the firm, as the receipt of customer input by itself does not drive the capture of such input. And, unless the input is captured, the firm cannot derive any learning that could lead to improvements in the existing offerings or creation of new offerings.

Word-of-mouth has always been considered a key factor affecting provider / service choice made by the customer. Customers do not always take the time and make the effort involved in contacting the firm to share their input, but they almost always tell others about their experience with the firm. This indirect customer feedback has become increasingly important for the firms to consider since the advent of internet has shrunk the distances and the entire world is now able to instantaneously share an experience had by a service customer anywhere

in the world. This requires that the firm not only learn from what the customers tell the firm, but also from what the customers tell others about the firm and its products and services. Given the ambiguities associated with what to look for, where to look for, and how frequently to look for, training and incentives for firm employees tasked with the indirect customer input capture have a strong and statistically significant positive impact on the capture of such input. Given the lack of control faced by the firm employees that make it very difficult for them to follow a set process for capturing indirect customer input, it is not surprising that formal process does not seem to affect the indirect customer input capture. While customer focus does not have a direct effect on the capture of indirect customer input, it does have a strong indirect effect on the capture through its correlations with training and incentives for the concerned firm employees, which have a direct impact on the capture of indirect customer input. Service focus does not seem to affect the capture of indirect customer input even though service-focused firms are more likely to capture the direct customer input. This may be a result of the service-focused firms doing a good job of capturing the direct customer input, reducing the need for a customer to express his input elsewhere. Negativity in the indirect customer input does not seem to affect the capture of such input, possibly because those tasked with the capture of indirect customer input generally do not face the same conflict of interest as faced by those who are involved in the service delivery and end up receiving direct customer input that may involve their own performance. Finally, whether a firm facilitates expression of customer input in the public domain through putting in place a virtual customer community / discussion forum does not seem to impact the capture of indirect customer input. Proliferation of a multitude of third-party discussion forums that are readily available to the customer can be partially responsible for this. Unlike in the past, today's customer is not dependent on the product or service provider to facilitate his or her interactions with other current and potential users of the firm's products or services. This may make the firm-backed discussion forums a non-critical element in the process through which a firm can look at and learn from indirect customer input. However, since the medium of social media is constantly evolving, the applicability of this finding may change or the finding may not hold uniformly across regions, industries, and customer segments in the future.

After receiving and capturing direct and indirect customer input, a firm then needs to sift through the voluminous data to understand and learn from this input. Our final model shows that dissemination of customer input-based insights across the firm has a strong positive effect on the extraction of innovation-driving insights from the customer input. While the capture of customer input has an indirect effect on the extraction of insights through its correlation with dissemination of insights and formal process for customer input analysis, it does not directly affect the extraction of insights. This suggests that availability of customer input does not lead to insights that can drive innovation within the firm unless the firm ensures that such input is rigorously analyzed and the findings are widely disseminated across the firm. Another important factor, the slack available to the employees to analyze the customer input shows strong correlation with the other three relevant factors – availability of customer input that can be analyzed, formal process for the analysis, and dissemination of findings across the firm, but does not directly affect the extraction of insights. Training, incentives, and level of experience for the firm personnel responsible for customer input analysis show a statistically non-significant effect on the extraction of insights. One can argue that unlike the solicited input that is sought for a specific reason idea or project, unsolicited input that reaches the firm does not follow any pattern or norm. Therefore, it may be hard to incentivize the firm personnel to extract innovation-driving insights from this input given the uncertainty associated with the contents of the input. In fact, the model shows that formal process for customer input analysis has a strong negative effect on the usefulness of the insights extracted through such analysis. This result clearly highlights the uncertainties associated with analyzing

the Unsolicited Customer Input, and suggests that firms looking to leverage the insights extracted from such analysis in driving their innovation efforts must consider the process of analysis an art and not a science. It also suggests that the firms that disseminate these insights across the firm actually create a virtuous loop – the dissemination requirement drives the personnel that are responsible for analyzing the input to extract as many valuable insights as possible, and these useful insights further increase the firm's appetite for such insights. These insights can provide the firm with the ideas that can lead to future innovation, even though the firm would still need to go through the entire process of developing that idea into a marketable innovation.

Collectively, these results clearly highlight the importance of a well-developed process through which a firm can handle the Unsolicited Customer Input in order to benefit from the insights contained in such input. Equally important are the factors that impact the success of each of the four steps of this process (receive direct customer input, capture direct customer input, capture indirect customer input, and analyze customer input) that can get the firm closer to its next innovation.

Figure 4.1 Conceptual Model of Factors Affecting the Receipt of Direct Customer Input

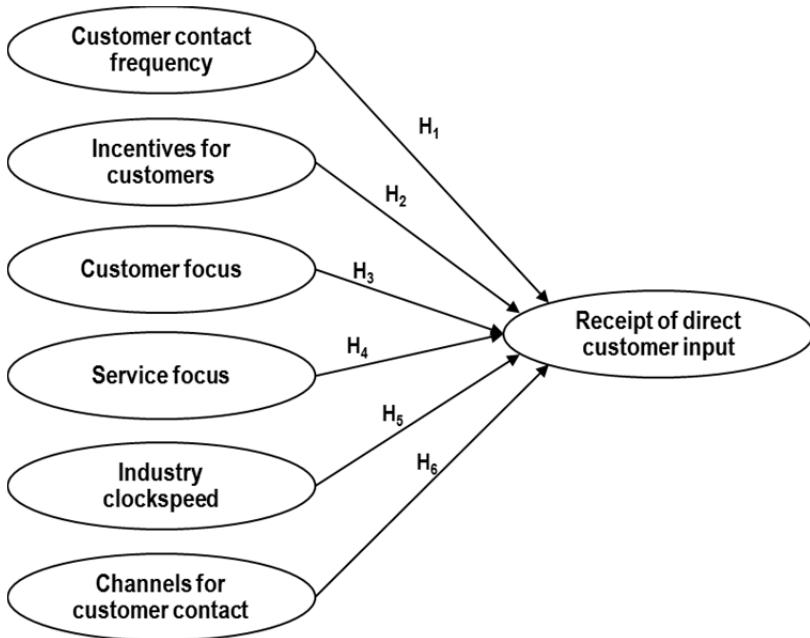


Figure 4.2 Conceptual Model of Factors Affecting the Capture of Direct Customer Input

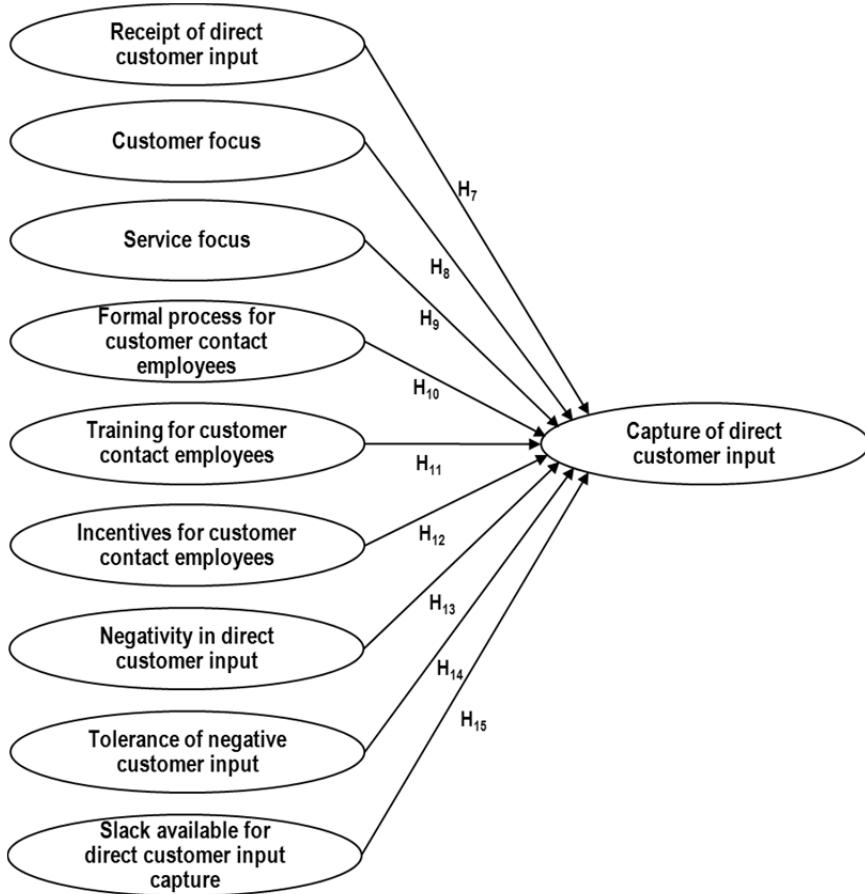


Figure 4.3 Conceptual Model of Factors Affecting the Capture of Indirect Customer Input

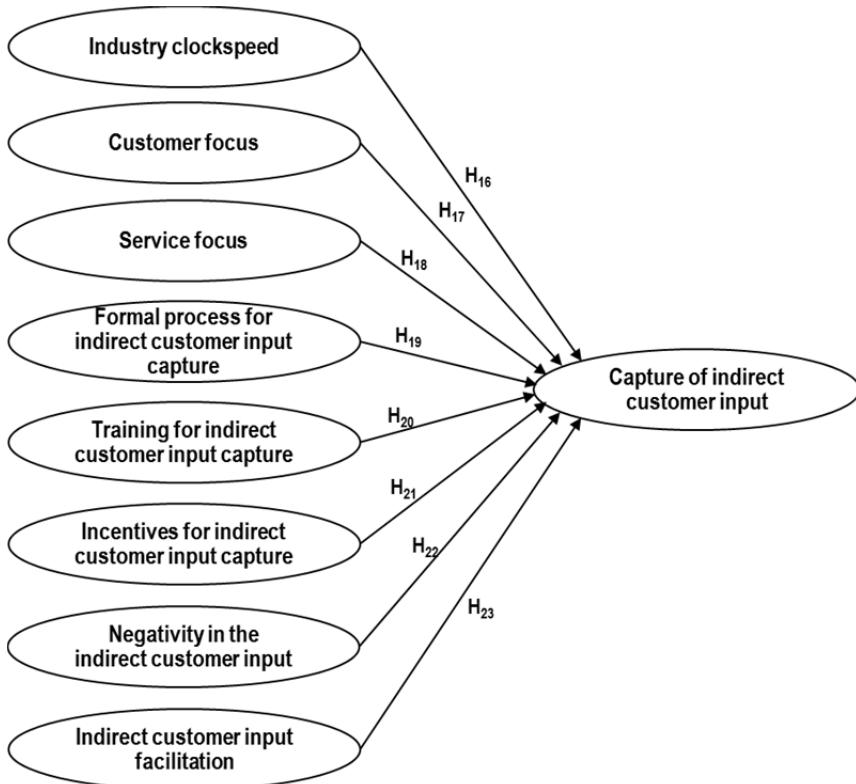


Figure 4.4 Conceptual Model of Factors Affecting the Usefulness of UCI Insights

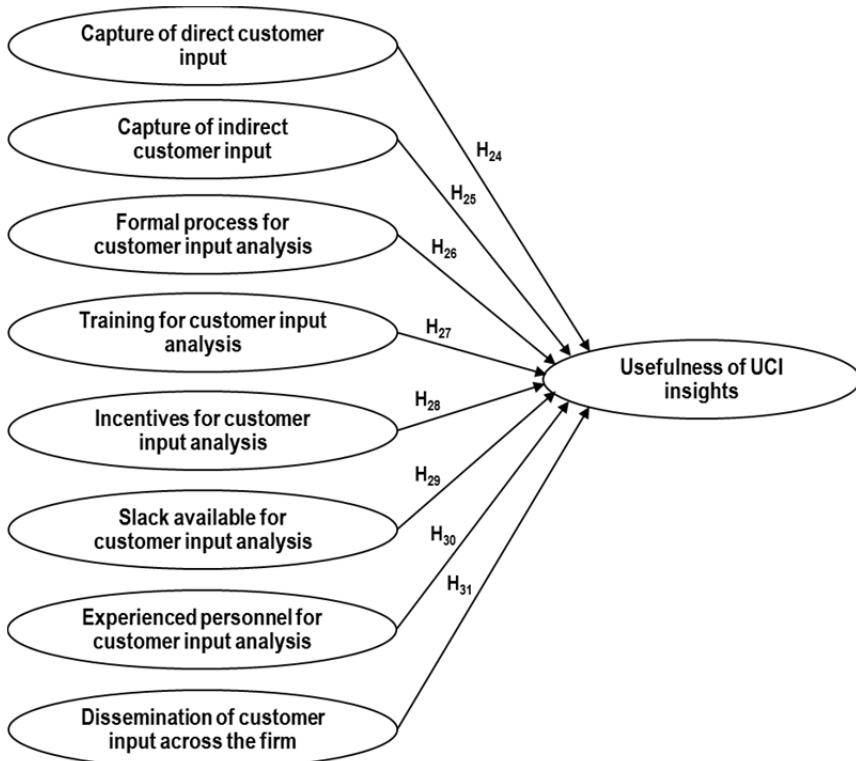


Figure 4.5 Research Model of Factors Affecting the Receipt of Direct Customer Input

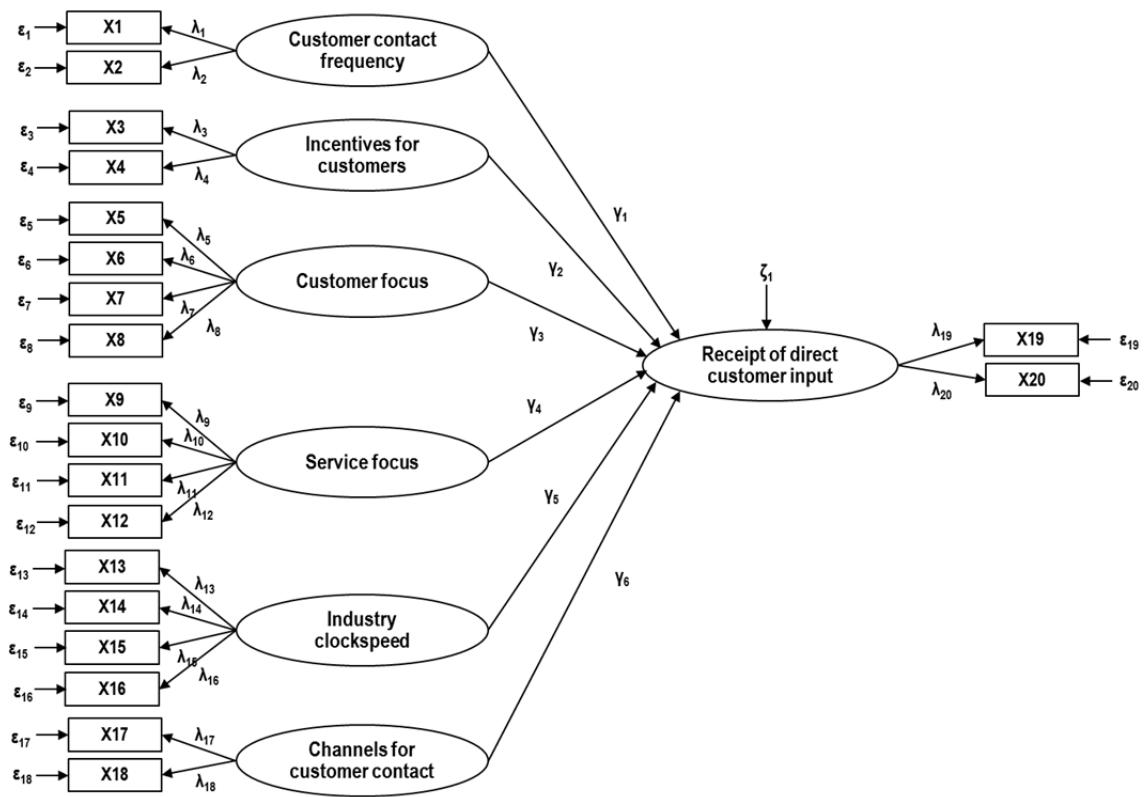


Figure 4.6 Research Model of Factors Affecting the Capture of Direct Customer Input

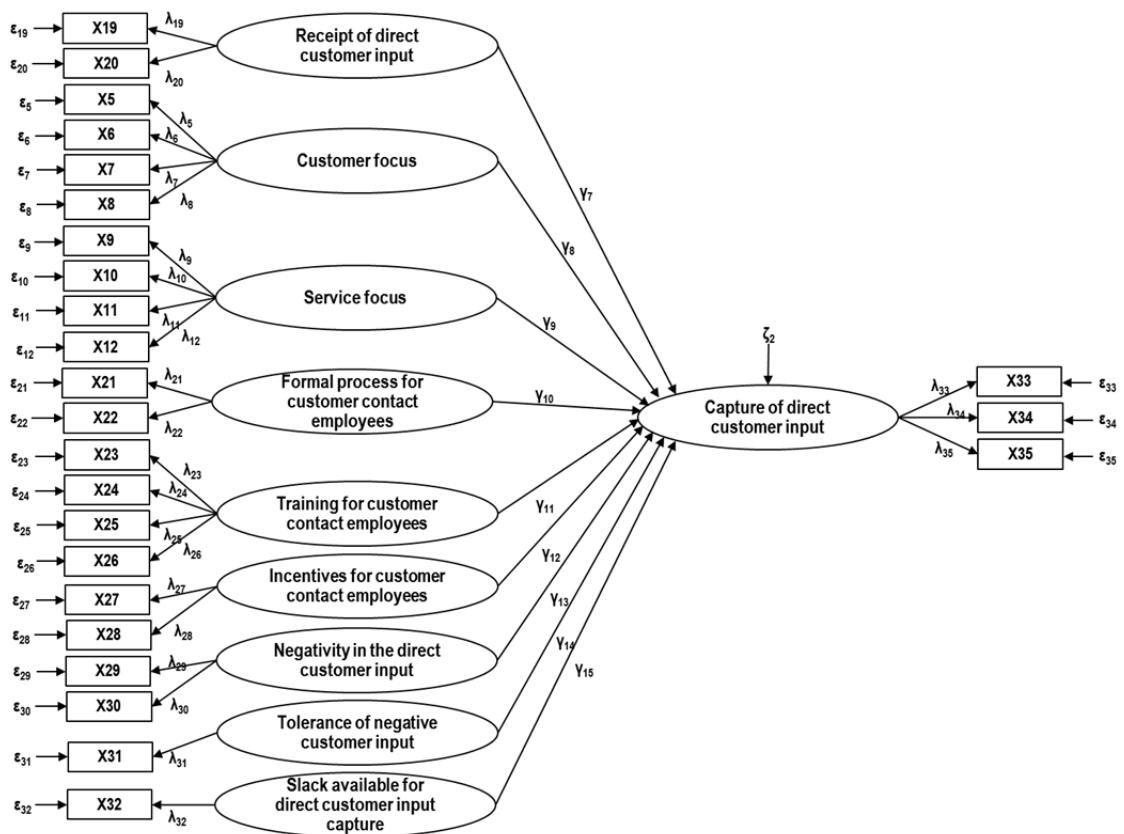


Figure 4.7 Research Model of Factors Affecting the Capture of Indirect Customer Input

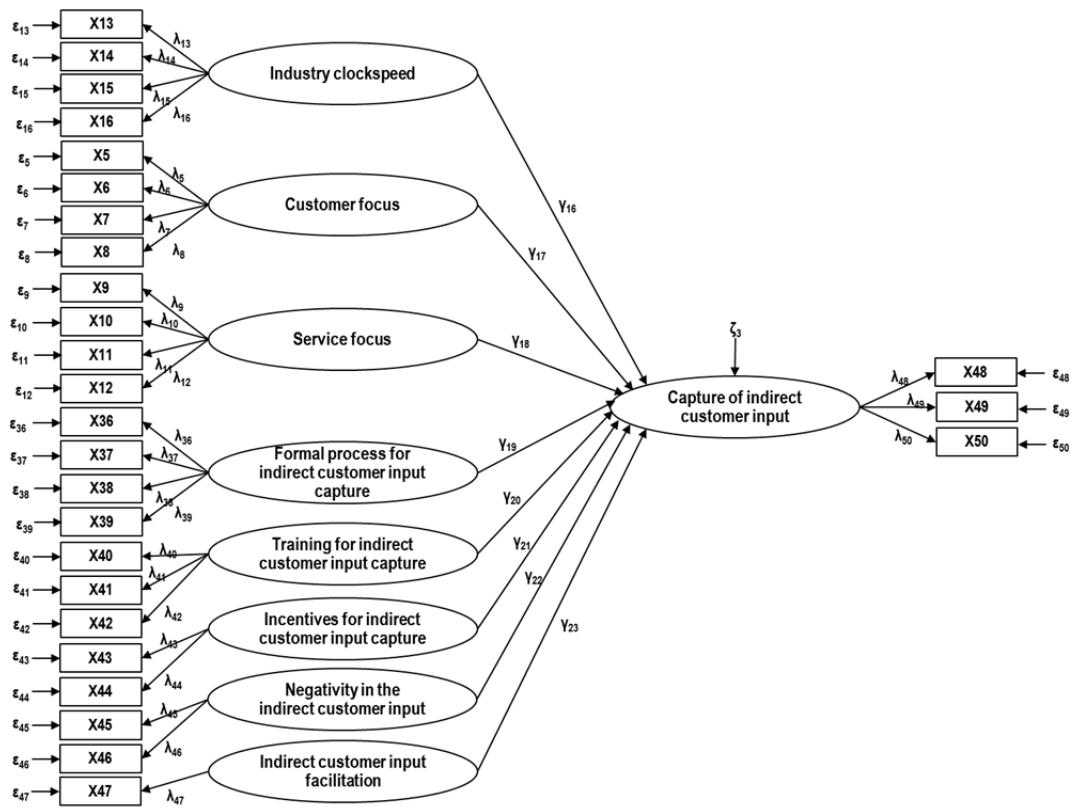


Figure 4.8 Research Model of Factors Affecting the Usefulness of UCI Insights

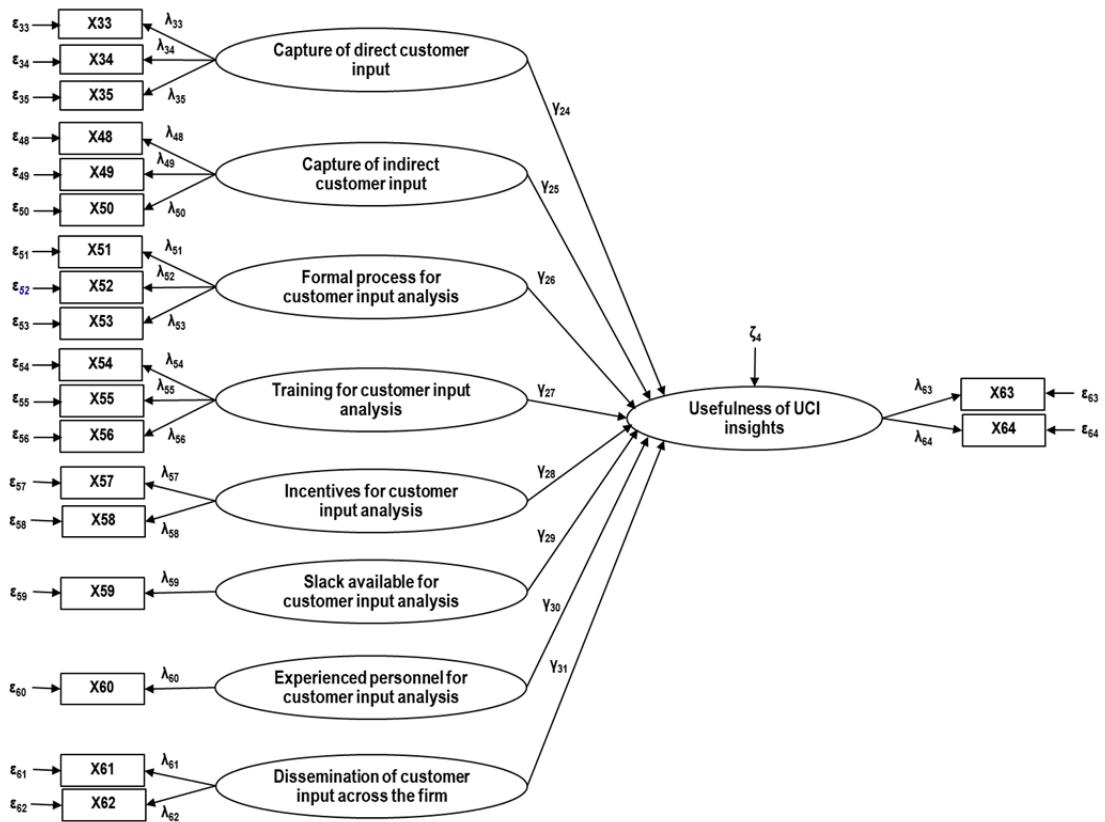
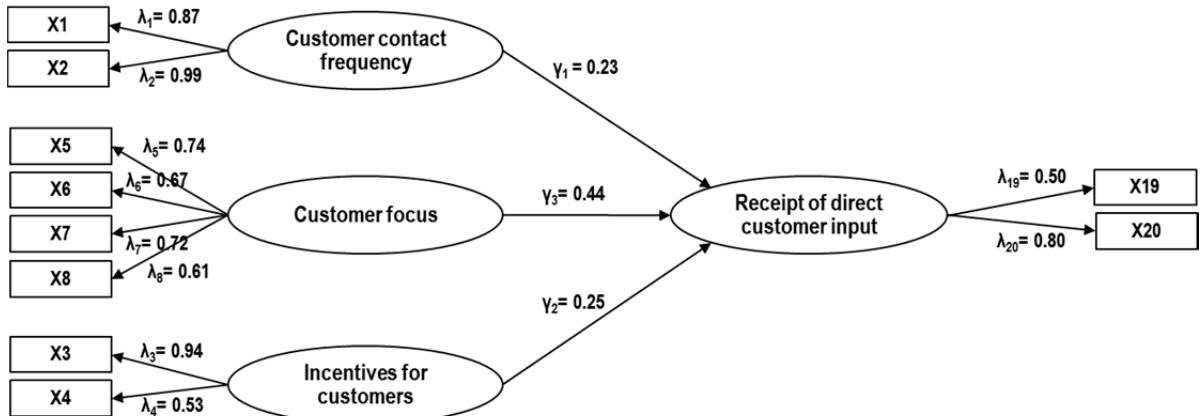
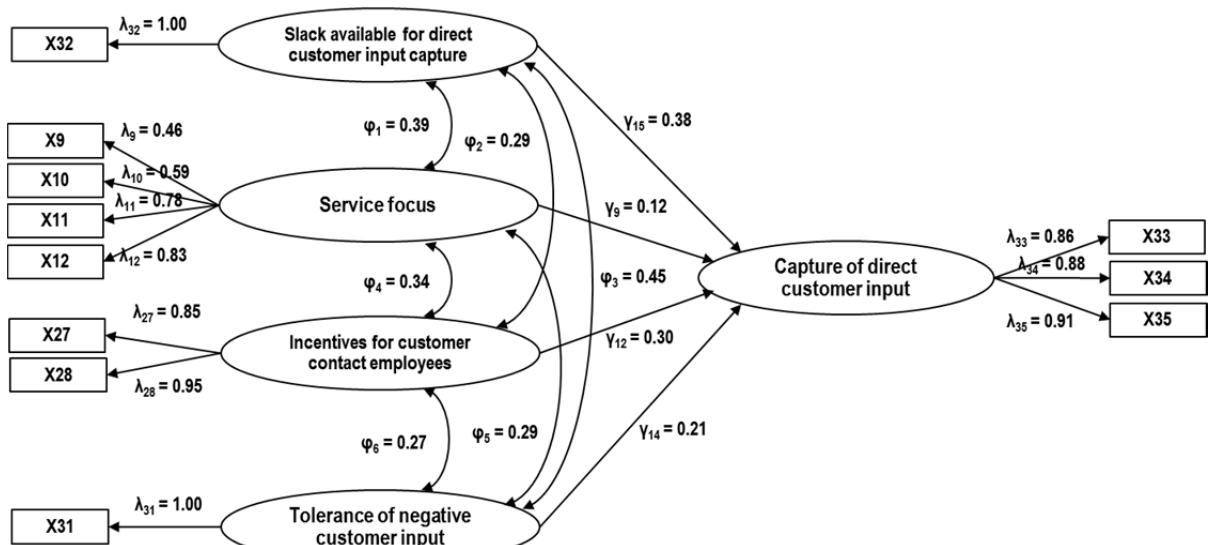


Figure 4.9 Estimated Model of Factors Affecting the Receipt of Direct Customer Input



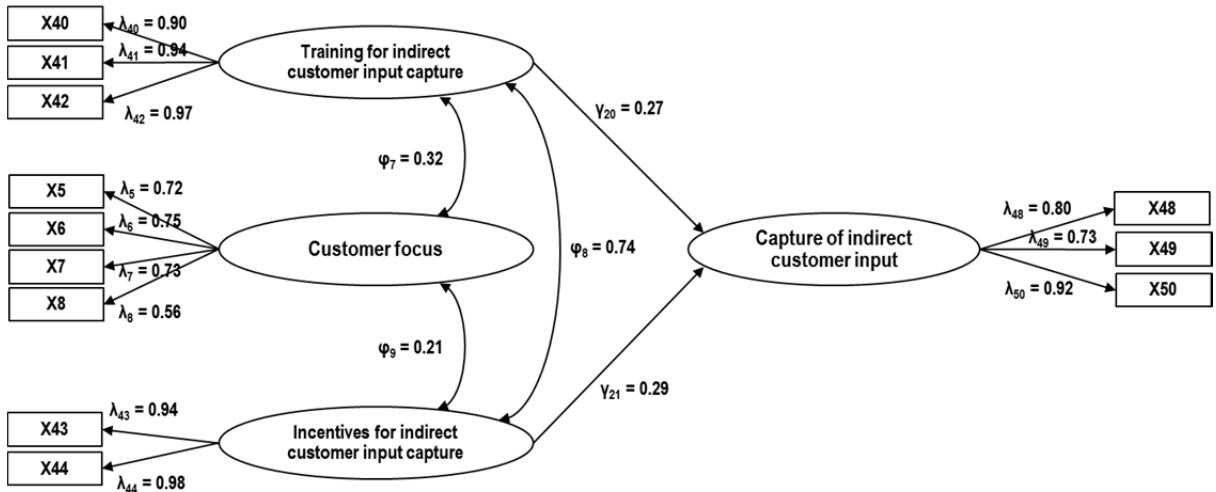
Notes: Overall fit: $\chi^2_{32\ df} = 50.84$ ($p = 0.018$). $\chi^2_{df} = 1.589$; NFI = 0.95; TLI = 0.97; CFI = 0.98; IFI = 0.98; GFI = 0.97; AGFI = 0.94; RMR = 0.06; 1-RMSEA = 0.95; $R^2_{\text{Receipt of Direct Customer Input}} = 0.31$. Standardized estimates statistically significant at $p < 0.05$ level.

Figure 4.10 Estimated Model of Factors Affecting the Capture of Direct Customer Input



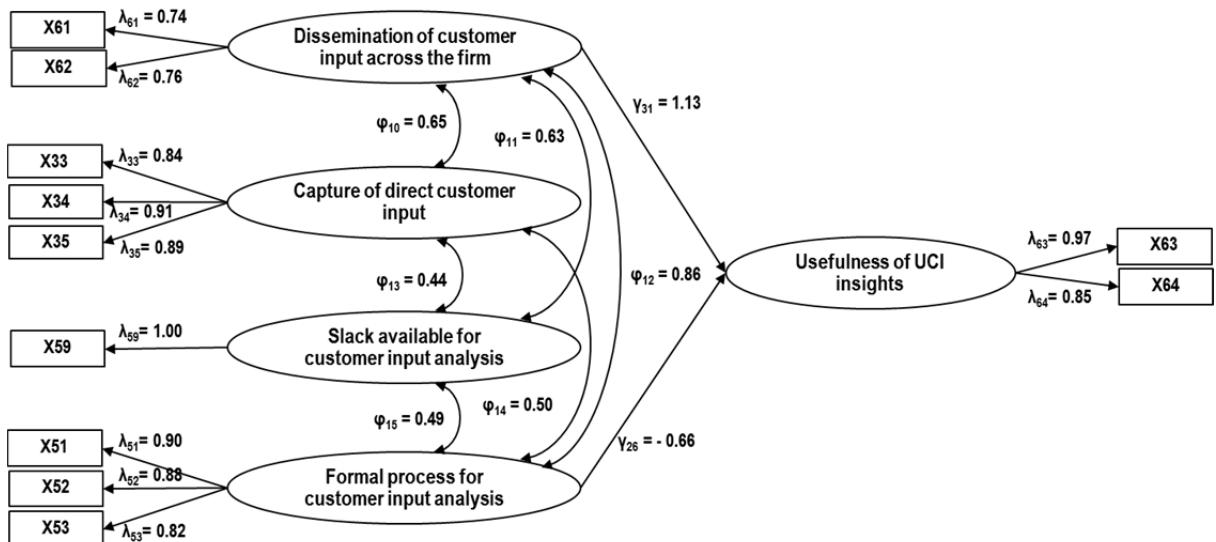
Notes: Overall fit: $\chi^2_{35\ df} = 36.79$ ($p = 0.386$). $\chi^2_{df} = 1.051$; NFI = 0.97; TLI = 0.99; CFI = 0.99; IFI = 0.99; GFI = 0.97; AGFI = 0.95; RMR = 0.03; 1-RMSEA = 0.98; $R^2_{\text{Capture of Direct Customer Input}} = 0.53$. Standardized estimates statistically significant at $p < 0.05$ level.

Figure 4.11 Estimated Model of Factors Affecting the Capture of Indirect Customer Input



Notes: Overall fit: $\chi^2_{49\text{ df}} = 59.81$ ($p = 0.138$). $\chi^2_{\text{df}} = 1.221$; NFI = 0.95; TLI = 0.99; CFI = 0.99; IFI = 0.99; GFI = 0.93; AGFI = 0.89; RMR = 0.04; 1-RMSEA = 0.96; $R^2_{\text{Capture of Indirect Customer Input}} = 0.27$. Standardized estimates statistically significant at $p < 0.05$ level.

Figure 4.12 Estimated Model of Factors Affecting the Usefulness of UCI Insights



Notes: Overall fit: $\chi^2_{38\text{ df}} = 40.64$ ($p = 0.355$). $\chi^2_{\text{df}} = 1.070$; NFI = 0.97; TLI = 0.99; CFI = 0.99; IFI = 0.99; GFI = 0.96; AGFI = 0.93; RMR = 0.04; 1-RMSEA = 0.98; $R^2_{\text{Usefulness of UCI Insights}} = 0.44$. Standardized estimates statistically significant at $p < 0.05$ level.

Table 4.1 Scale Reliability based on Exploratory Factor Analysis

Construct^d	Items	Variance extracted	Communalities^c	Inter-item correlations^a	Cronbach's alpha^{a,b}
Customer contact frequency	2	0.93	0.94	0.87	0.93 ^a
Industry Clockspeed	4	0.63	> 0.5	> 0.4	0.81
Customer Focus	4	0.62	> 0.5	> 0.5	0.80
Service Focus	4	0.64	> 0.6	> 0.4	0.81
Channels for customer contact	2	0.86	0.86	0.73	0.84 ^a
Incentives for customers to get in touch with the firm	2	0.75	0.75	0.49	0.66 ^a
Receipt of direct customer input	2	0.70	0.70	0.41	0.58 ^a
Formal Process for customer contact employees	2	0.94	0.94	0.88	0.93 ^a
Training for customer contact employees	4	0.93	> 0.7	> 0.6	0.93
Incentives for customer contact employees	2	0.89	0.89	0.78	0.87 ^a
Negativity in the direct customer input	2	0.90	0.90	0.81	0.89 ^a
Capture of direct customer input	3	0.86	> 0.8	> 0.7	0.92
Formal process for indirect customer input capture	4	0.79	> 0.7	> 0.6	0.91
Training for indirect customer input capture	3	0.91	> 0.8	> 0.8	0.95
Incentives for indirect customer input capture	2	0.97	0.97	0.94	0.97 ^a
Negativity in the indirect customer input	2	0.95	0.95	0.91	0.95 ^a
Capture of indirect customer input	3	0.82	> 0.7	> 0.6	0.89
Formal process for customer input analysis	3	0.83	> 0.7	> 0.7	0.90
Training for customer input analysis	3	0.90	> 0.8	> 0.8	0.94
Incentives for customer input analysis	2	0.95	0.96	0.91	0.95 ^a
Dissemination of customer input across the firm	2	0.80	0.80	0.60	0.75 ^a
Usefulness of UCI insights	2	0.896	> 0.8	0.79	0.88 ^a

^a Cronbach's alpha is not an important criterion for scales with only two items as long as inter-item correlation is above 0.4 (Briggs and Cheek, 1986).

^b Cronbach's alpha value of 0.7 (Nunnally, 1978) / 0.8 (Nunnally, 1993) or greater indicates a reliable scale.

^c Communalities after extraction should be above 0.5 (Field, 2005)

^d Kaiser-Meyer-Olkin measure > 0.5 (Kaiser, 1974) and Barlett's test significant at p < 0.05 for all constructs

Table 4.2 Scale Reliability based on Confirmatory Factor Analysis

Construct	χ^2 (p-value)	AGFI ^a	TLI ^a	NFI ^a	CFI ^a	RMSEA (p-value) ^a	AVE ^b	CR ^c
Customer contact frequency	0.00 (p = 0.99)	1.00	1.00	1.00	1.00	0.00 (p = 0.99)	0.86	0.92
Industry Clockspeed	2.31 (p = 0.13)	0.94	0.96	0.99	0.99	0.09 (p = 0.21)	0.48	0.78
Customer Focus	0.55 (p = 0.76)	0.99	1.00	1.00	1.00	0.00 (p = 0.84)	0.48	0.79
Service Focus	3.08 (p = 0.08)	0.94	0.97	0.99	1.00	0.09 (p = 0.17)	0.49	0.78
Channels for customer contact	0.00 (p = 0.99)	1.00	1.00	1.00	1.00	0.00 (p = 0.99)	0.72	0.83
Incentives for customers to get in touch with the firm	0.00 (p = 0.99)	1.00	1.00	1.00	1.00	0.00 (p = 0.99)	0.47	0.63
Receipt of direct customer input	0.00 (p = 0.97)	1.00	1.00	1.00	1.00	0.00 (p = 0.98)	0.44	0.61
Formal Process for customer contact employees	0.04 (p = 0.85)	1.00	1.00	1.00	1.00	0.00 (p = 0.88)	0.87	0.93
Training for customer contact employees	0.04 (p = 0.85)	1.00	1.00	1.00	1.00	0.00 (p = 0.88)	0.74	0.92
Incentives for customer contact employees	0.13 (p = 0.91)	1.00	1.00	1.00	1.00	0.00 (p = 0.93)	0.81	0.9
Negativity in the direct customer input	0.14 (p = 0.71)	1.00	1.00	1.00	1.00	0.00 (p = 0.78)	0.78	0.88
Capture of direct customer input	0.00 (p = 0.95)	1.00	1.00	1.00	1.00	0.00 (p = 0.97)	0.78	0.91
Formal process for indirect customer input capture	0.15 (p = 0.70)	0.99	1.00	1.00	1.00	0.00 (p = 0.74)	0.67	0.89
Training for indirect customer input capture	0.05 (p = 0.94)	1.00	1.00	1.00	1.00	0.00 (p = 0.95)	0.87	0.95
Incentives for indirect customer input capture	0.02 (p = 0.90)	1.00	1.00	1.00	1.00	0.00 (p = 0.91)	0.92	0.96
Negativity in the indirect customer input	0.23 (p = 0.63)	1.00	1.00	1.00	1.00	0.00 (p = 0.68)	0.92	0.96
Capture of indirect customer input	0.00 (p = 0.95)	1.00	1.00	1.00	1.00	0.00 (p = 0.96)	0.67	0.86
Formal process for customer input analysis	0.00 (p = 0.98)	1.00	1.00	1.00	1.00	0.00 (p = 0.99)	0.75	0.90
Training for customer input analysis	0.06 (p = 0.80)	1.00	1.00	1.00	1.00	0.00 (p = 0.84)	0.84	0.94
Incentives for customer input analysis	0.04 (p = 0.85)	1.00	1.00	1.00	1.00	0.00 (p = 0.88)	0.92	0.96
Dissemination of customer input across the firm	0.00 (p = 0.98)	1.00	1.00	1.00	1.00	0.00 (p = 0.98)	0.6	0.75
Usefulness of UCI insights	0.00 (p = 0.99)	1.00	1.00	1.00	1.00	0.00 (p = 0.99)	0.84	0.92

^a Adjusted Goodness-of-fit index (AGFI), Tucker-Lewis index (TLI), Normed fit index (NFI), Comparative Fit Index (CFI) values equal to or exceeding 0.90, and Root Mean Square Error of Approximation (RMSEA) values equal to 0.05 or below indicate strong scale unidimensionality.

^b AVE (Average Variance Extracted) values equal to or exceeding .50 indicate that the measures are reflective of the construct.

^c CR (Composite Reliability) values equal to or exceeding .70 indicate strong scale reliability.

Table 4.3 Standardized Path Loadings from CFA and Descriptive Statistics

Construct and measurement items	Std. path loadings	Critical Ratio	Mean^a	SD
Customer contact frequency				
How frequently does an average customer / user NEED TO interact with the firm during the life cycle of a product / service?	0.93	28.37	4.63	1.81
How frequently does an average customer / user ACTUALLY interact with the firm during the life cycle of a product / service?	0.92	-	4.67	1.73
Industry Clockspeed				
In our industry, customers look for new products / services all the time	0.59	6.67	4.69	1.68
In our industry, taste and preferences of customers change very quickly	0.50	5.75	3.54	1.66
In our industry, the rate of innovation in products and services is rapid	0.91	-	4.08	1.86
In our industry, the rate of innovation in operations process is rapid	0.69	7.42	3.60	1.65
Customer Focus				
We strive to be highly responsive to our customers' needs	0.76	8.08	5.74	1.34
Our organization is more customer focused than are our competitors	0.66	7.44	4.96	1.43
We rapidly attend to complaints from our customers	0.74	-	5.52	1.37
We view customers as potential and valuable sources of new offering ideas and opportunities	0.60	6.84	5.30	1.50
Service Focus				
Our firm offers an explicit product / service guarantee	0.71	8.56	4.70	1.91
The product / service guarantee offered by our firm is the best in the industry	0.97	-	4.38	1.66
Our firm has an explicit customer recovery (turning around a negative experience a customer has had with the firm's product / service) policy	0.48	6.30	3.91	1.82
Our firm has the most customer-friendly customer recovery policy in the industry	0.55	7.56	3.76	1.56
Channels for customer contact				
Number of channels made available to the customers to help them reach the firm (such as in-person, phone, fax, email, internet)	0.84	-	4.97	1.10
Number of hours for which each channel is available to the customers every day	0.85	18.73	5.04	1.12
Incentives for customers to get in touch with the firm				
Our firm offers monetary incentives to encourage the customers to provide valuable feedback to the firm	0.58	-	1.91	1.52
Our firm offers non-monetary incentives to encourage the customers to provide valuable feedback to the firm	0.77	13.02	3.00	1.98
Receipt of direct customer input				
Customers frequently contact us with ideas on how we can do things differently or better	0.67	-	3.88	1.61

Customers always tell us how well our product / service meets and / or exceeds their expectations	0.66	9.84	4.47	1.58
Formal Process for customer contact employees				
Our firm has formal / written procedures for handling customer contact	0.94	-	4.76	2.13
Our customer-contact personnel always follow these procedures for handling customer contact	0.93	27.23	4.72	1.81
Training for customer contact employees				
Our employees are trained in how to handle product / service failures and customer complaints	0.81	16.42	4.92	1.85
Our employees are trained on what customer and incidence details to capture while interacting with the customer	0.79	-	4.55	1.83
The training process for customer-contact employees is very structured and formal in our firm	0.90	15.21	3.89	1.94
Most of our customer-contact personnel have already received this training	0.94	15.69	4.54	2.01
Incentives for customer contact employees				
Our firm incentivizes customer-contact personnel to do the best they can to fully address a customer concern	0.91	-	3.93	1.97
Our firm incentivizes customer-contact personnel to capture all relevant customer and incidence details while interacting with the customer	0.90	22.15	3.77	1.91
Negativity in the direct customer input				
The direct customer feedback that we receive in any period is (mostly negative...to...mostly positive)	0.87	-	4.86	1.35
The direct customer feedback that we record in any period is (mostly negative...to...mostly positive)	0.90	21.44	4.67	1.52
Capture of direct customer input				
Our customer contact personnel ACTUALLY record most of the complaints received from the customers	0.86	-	5.05	1.86
Our customer contact personnel ACTUALLY record most of the suggestions received from the customers	0.88	18.97	4.54	1.78
Our customer contact personnel ACTUALLY capture most of the relevant customer contact details when they record customer feedback	0.91	20.42	4.82	1.72
Formal process for indirect customer input capture				
Our firm has a dedicated department responsible for scanning and recording indirect customer feedback	0.69	-	2.83	2.08
Scanning and recording indirect customer feedback is part of the formal / written job specification for some of our employees	0.72	11.42	2.90	2.09
Our firm has formal / written procedures for scanning and recording indirect customer feedback	0.95	9.39	2.90	1.98
Our staff responsible for collecting indirect customer feedback ACTUALLY follows these procedures	0.90	9.38	3.36	1.94
Training for indirect customer input capture				
Our staff responsible for collecting indirect customer feedback is trained on how to look for and record indirect customer feedback	0.89	-	3.20	2.01

The training process for our staff responsible for collecting indirect customer feedback is very structured and formal	0.94	20.31	2.96	1.90
Most of our staff responsible for collecting indirect customer feedback have already received this training	0.97	22.19	3.09	1.96
Incentives for indirect customer input capture				
Our firm incentivizes these employees to scan as many instances of indirect customer feedback as possible	0.96	-	2.55	1.65
Our firm incentivizes these employees to record as many actionable instances of indirect customer feedback as possible	0.96	28.73	2.60	1.70
Negativity in the indirect customer input				
The indirect customer feedback that we scan in any period is	0.96	-	4.59	1.33
The indirect customer feedback that we record in any period is	0.96	29.59	4.52	1.36
Capture of indirect customer input				
Our firm scans social media such as Facebook and Twitter for indirect customer feedback	0.79	-	3.13	2.18
Our firm scans the press and other public domain areas for indirect customer feedback	0.72	9.76	4.24	2.20
Our firm scans online forums related to our business for indirect customer feedback	0.93	12.96	3.63	2.14
Formal process for customer input analysis				
Our firm has a dedicated department that analyzes customer feedback	0.89	-	3.78	2.19
Our firm has formal / written rules and procedures for analyzing customer feedback	0.90	17.33	3.67	2.03
Evaluation of customer feedback is a formal activity in our firm	0.81	14.62	4.60	2.00
Training for customer input analysis				
These employees are trained on how to analyze customer feedback	0.90	-	3.81	1.95
The training process for the employees responsible for analyzing customer feedback is very structured and formal	0.95	23.46	3.46	1.88
Most of the employees responsible for analyzing customer feedback have already received this training	0.91	20.7	3.65	1.88
Incentives for customer input analysis				
Our firm incentivizes these employees to analyse as many instances of customer feedback as possible	0.96	-	2.98	1.82
Our firm incentivizes these employees to find as many actionable customer insights as possible	0.96	32.07	3.06	1.85
Dissemination of customer input across the firm				
Our firm uses structured channels and formal mechanisms to share customer insights across the firm	0.78	-	3.75	1.98
Customer feedback data is regularly disseminated at all levels in our firm	0.77	11.91	4.09	1.92
Usefulness of UCI insights				
The feedback provided by the customers is generally useful for improving the products / services concerned ^c	0.91	-	5.31	1.37
The feedback provided by the customer is generally useful for designing new products / services ^c	0.93	20.84	5.01	1.51

^a Likert-scale responses from 1 (strongly disagree) to 7 (strongly agree).

Tables 4.4a – 4.4d Discriminant Validity Analysis: Constrained vs. Unconstrained CFA Models

Test with	Correlation Estimate	Critical Ratio	χ^2 (Constrained Model) ^e	χ^2 (Unconstrained Model) ^e	χ^2 Difference
Customer contact frequency					
Industry Clockspeed	0.06	0.86	32.41 (10)	14.17 (9)	18.24 ^a
Customer Focus	0.15	2.07	45.53 (11)	10.37 (10)	35.16 ^a
Service Focus	-0.07	-1.05	49.55 (10)	5.96 (9)	43.59 ^a
Channels for customer contact	0.10	1.46	115.70 (6)	0.66 (5)	115.04 ^a
Incentives for customers to get in touch with the firm	-0.10	-1.21	120.24 (6)	4.24 (5)	116.00 ^a
Receipt of direct customer input	0.20	2.50	31.98 (6)	1.17 (5)	30.81 ^a
Industry Clockspeed					
Customer Focus	0.35	4.23	43.70 (19)	36.54 (18)	7.16 ^b
Service Focus	0.02	0.26	50.03 (18)	30.53 (17)	19.50 ^a
Channels for customer contact	0.15	1.97	44.70 (10)	8.00 (9)	36.70 ^a
Incentives for customers to get in touch with the firm	0.19	2.26	55.54 (10)	26.85 (9)	28.69 ^a
Receipt of direct customer input	0.33	3.81	19.71 (10)	12.84 (9)	6.87 ^b
Customer Focus					
Service Focus	0.42	4.88	53.82 (19)	46.80 (18)	7.02 ^b
Channels for customer contact	0.47	5.95	55.94 (11)	10.18 (10)	45.76 ^a
Incentives for customers to get in touch with the firm	0.14	1.53	94.79 (11)	9.69 (10)	85.10 ^a
Receipt of direct customer input	0.46	4.99	53.76 (11)	28.01 (10)	25.75 ^a
Service Focus					
Channels for customer contact	0.29	4.08	41.80 (10)	13.13 (9)	28.67 ^a
Incentives for customers to get in touch with the firm	0.25	3.12	46.98 (10)	16.33 (9)	30.65 ^a
Receipt of direct customer input	0.15	1.82	39.73 (10)	13.94 (9)	25.79 ^a
Channels for customer					

contact					
Incentives for customers to get in touch with the firm	0.27	3.28	125.74 (6)	2.31 (5)	123.43 ^a
Receipt of direct customer input	0.21	2.37	104.70 (6)	0.62 (5)	104.08 ^a
Incentives for customers to get in touch with the firm					
Receipt of direct customer input	0.29	3.01	76.83 (6)	2.76 (5)	74.07 ^a

Table 4.4b Discriminant Validity Analysis: Constrained vs. Unconstrained CFA Model

Test with	Correlation Estimate	Critical Ratio	χ^2 (Constrained Model) ^e	χ^2 (Unconstrained Model) ^e	χ^2 Difference
Receipt of direct customer input					
Customer Focus	0.41	4.19	48.84 (11)	22.84 (10)	26.00 ^a
Service Focus	0.17	1.85	32.77 (10)	12.56 (9)	20.21 ^a
Formal Process for customer contact employees	0.20	2.27	22.03 (6)	4.64 (5)	17.39 ^a
Training for customer contact employees	0.19	2.07	33.08 (10)	6.21 (9)	26.87 ^a
Incentives for customer contact employees	0.37	4.57	9.23 (6)	3.95 (5)	5.28 ^c
Negativity in the direct customer input	0.27	3.12	74.16 (6)	10.04 (5)	64.12 ^a
Capture of direct customer input	0.29	3.49	28.67 (8)	10.88 (7)	17.79 ^a
Customer Focus					
Service Focus	0.42	4.51	45.80 (19)	40.93 (18)	4.87 ^c
Formal Process for customer contact employees	0.27	3.34	19.93 (11)	7.72 (10)	12.21 ^a
Training for customer contact employees	0.38	4.18	38.66 (19)	27.84 (18)	10.82 ^b
Incentives for customer contact employees	0.31	3.80	18.38 (11)	8.34 (10)	10.04 ^b
Negativity in the direct customer input	0.31	3.77	53.34 (11)	15.03 (10)	38.31 ^a
Capture of direct customer input	0.48	5.82	27.46 (15)	22.26 (14)	5.20 ^c
Service Focus					

Formal Process for customer contact employees	0.31	4.28	9.80 (10)	9.55 (9)	0.25 ^d
Training for customer contact employees	0.32	3.95	37.62 (18)	34.76 (17)	2.86 ^d
Incentives for customer contact employees	0.27	3.64	12.99 (10)	11.59 (9)	1.40 ^d
Negativity in the direct customer input	0.22	2.85	33.14 (10)	15.00 (9)	18.14 ^a
Capture of direct customer input	0.34	4.67	18.84 (14)	18.05 (13)	0.79 ^d
Formal Process for customer contact employees					
Training for customer contact employees	0.77	11.71	62.31 (10)	24.80 (9)	37.51 ^a
Incentives for customer contact employees	0.39	6.25	11.03 (6)	9.80 (5)	1.23 ^d
Negativity in the direct customer input	-0.20	-2.72	109.38 (6)	6.01 (5)	103.37 ^a
Capture of direct customer input	0.47	8.23	18.19 (8)	14.91 (7)	3.28 ^d
Training for customer contact employees					
Incentives for customer contact employees	0.54	7.51	5.90 (10)	3.24 (9)	2.66 ^d
Negativity in the direct customer input	-0.04	-0.52	82.22 (10)	19.01 (9)	63.21 ^a
Capture of direct customer input	0.59	8.44	37.85 (14)	34.56 (13)	3.29 ^d
Incentives for customer contact employees					
Negativity in the direct customer input	0.09	1.20	42.68 (6)	1.63 (5)	41.05 ^a
Capture of direct customer input	0.49	8.78	14.63 (8)	10.74 (7)	3.89 ^c
Negativity in the direct customer input					
Capture of direct customer input	0.22	3.10	55.23 (8)	23.00 (7)	32.23 ^a

Table 4.4c Discriminant Validity Analysis: Constrained vs. Unconstrained CFA Model

Test with	Correlation Estimate	Critical Ratio	χ^2 (Constrained Model) ^e	χ^2 (Unconstrained Model) ^e	χ^2 Difference
Industry Clockspeed					
Customer Focus	0.35	4.23	43.70 (19)	36.54 (18)	7.16 ^b
Service Focus	0.02	0.26	50.03 (18)	30.53 (17)	19.50 ^a

Formal process for indirect customer input capture	0.11	1.17	17.05 (18)	9.79 (17)	7.26 ^b
Training for indirect customer input capture	0.23	2.41	27.15 (14)	25.04 (13)	2.11 ^d
Incentives for indirect customer input capture	0.27	2.91	9.40 (10)	7.94 (9)	1.46 ^d
Negativity in the indirect customer input	0.03	-0.30	37.53 (10)	8.81 (9)	28.72 ^a
Capture of indirect customer input	0.20	2.05	23.04 (14)	20.49 (13)	2.55 ^d
Customer Focus					
Service Focus	0.42	4.51	45.80 (19)	40.93 (18)	4.87 ^c
Formal process for indirect customer input capture	0.23	2.10	28.37 (19)	16.08 (18)	12.29 ^a
Training for indirect customer input capture	0.32	3.20	27.36 (15)	19.31 (14)	8.05 ^b
Incentives for indirect customer input capture	0.21	2.14	28.79 (11)	12.79 (10)	16.00 ^a
Negativity in the indirect customer input	0.20	1.95	47.78 (11)	10.3 (10)	37.48 ^a
Capture of indirect customer input	0.23	2.17	26.41 (15)	14.29 (14)	12.12 ^a
Service Focus					
Formal process for indirect customer input capture	0.32	3.00	24.03 (18)	22.90 (17)	1.13 ^d
Training for indirect customer input capture	0.30	3.24	13.61 (14)	12.95 (13)	0.66 ^d
Incentives for indirect customer input capture	0.23	2.46	10.94 (10)	7.88 (9)	3.06 ^d
Negativity in the indirect customer input	0.10	1.06	26.50 (10)	8.43 (9)	18.07 ^a
Capture of indirect customer input	0.20	2.07	30.44 (14)	27.72 (13)	2.72 ^d
Formal process for indirect customer input capture					
Training for indirect customer input capture	0.88	8.88	66.55 (14)	41.04 (13)	25.51 ^a
Incentives for indirect customer input capture	0.70	7.44	37.00 (10)	27.52 (9)	9.48 ^b
Negativity in the indirect customer input	0.04	0.43	37.94 (10)	10.65 (9)	27.29 ^a
Capture of indirect customer input	0.59	5.91	53.65 (14)	49.68 (13)	3.97 ^c

Training for indirect customer input capture

Incentives for indirect customer input capture	0.74	19.50	44.19 (8)	9.26 (7)	34.93 ^a
Negativity in the indirect customer input	0.01	0.11	66.53 (8)	22.22 (7)	44.31 ^a
Capture of indirect customer input	0.48	6.69	11.67 (11)	8.97 (10)	2.70 ^d
Incentives for indirect customer input capture					
Negativity in the indirect customer input	0.07	0.78	44.30 (6)	1.25 (5)	43.05 ^a
Capture of indirect customer input	0.49	6.96	3.88 (8)	1.53 (7)	2.35 ^d
Negativity in the indirect customer input					
Capture of indirect customer input	0.14	1.53	27.89 (8)	6.53 (7)	21.36 ^a

Table 4.4d Discriminant Validity Analysis: Constrained vs. Unconstrained CFA Model

Test with	Correlation Estimate	Critical Ratio	χ^2 (Constrained Model) ^e	χ^2 (Unconstrained Model) ^e	χ^2 Difference
Capture of direct customer input					
Capture of indirect customer input	0.16	1.99	22.87 (11)	13.81 (10)	9.06 ^b
Formal process for customer input analysis	0.51	8.37	11.97 (11)	5.90 (10)	6.07 ^c
Training for customer input analysis	0.55	10.14	15.70 (11)	8.76 (10)	6.94 ^b
Incentives for customer input analysis	0.44	6.92	5.18 (8)	4.30 (7)	0.88 ^d
Dissemination of customer input across the firm	0.61	9.78	9.14 (8)	2.74 (7)	6.40 ^c
Usefulness of UCI insights	0.44	6.58	15.49 (8)	13.42 (7)	2.07 ^d
Capture of indirect customer input					
Formal process for customer input analysis	0.34	4.58	16.11 (11)	15.92 (10)	0.19 ^d
Training for customer input analysis	0.30	4.05	9.28 (11)	8.67 (10)	0.61 ^d
Incentives for customer input analysis	0.32	4.53	5.43 (8)	5.38 (7)	0.05 ^d
Dissemination of customer input across the firm	0.27	3.10	7.25 (8)	4.88 (7)	2.37 ^d
Usefulness of UCI insights	0.13	1.61	32.38 (8)	6.51 (7)	25.87 ^a

Formal process for customer input analysis					
Training for customer input analysis	0.85	34.92	115.90 (11)	13.68 (10)	102.22 ^a
Incentives for customer input analysis	0.53	9.57	16.75 (8)	4.57 (7)	12.18 ^a
Dissemination of customer input across the firm	0.83	18.71	59.09 (8)	7.82 (7)	51.27 ^a
Usefulness of UCI insights	0.30	4.02	13.28 (8)	10.26 (7)	3.02 ^d
Training for customer input analysis					
Incentives for customer input analysis	0.63	14.20	31.79 (8)	8.46 (7)	23.33 ^a
Dissemination of customer input across the firm	0.76	15.84	35.33 (8)	4.25 (7)	31.08 ^a
Usefulness of UCI insights	0.32	4.49	23.55 (8)	16.90 (7)	6.65 ^b
Incentives for customer input analysis					
Dissemination of customer input across the firm	0.64	11.37	15.31 (6)	0.75 (5)	14.56 ^a
Usefulness of UCI insights	0.34	4.81	15.81 (6)	11.50 (5)	4.31 ^c
Dissemination of customer input across the firm					
Usefulness of UCI insights	0.49	6.86	12.06 (6)	11.72 (5)	0.34 ^d

^a χ^2 difference significant at $p < 0.001$, ^b χ^2 difference significant at $p < 0.01$, ^c χ^2 difference significant at $p < 0.05$, ^d χ^2 difference non-significant.

^e The values in parenthesis denote degrees of freedom

Tables 4.5a – 4.5d Comparison of Scale AVE with Squared Inter-Factor Correlation

Factor covariance	Customer contact frequency	Industry Clockspeed	Customer Focus	Service Focus	Channels for customer contact	Incentives for customers to get in touch with the firm	Receipt of direct customer input
Customer contact frequency	0.00	0.02	0.00	0.01	0.01	0.01	0.04
Industry Clockspeed	0.00	0.12	0.00	0.02	0.02	0.04	0.11
Customer Focus	0.02	0.12	0.18	0.22	0.02	0.02	0.21
Service Focus	0.00	0.00	0.18	0.08	0.06	0.06	0.02
Channels for customer contact	0.01	0.02	0.22	0.08	0.07	0.07	0.04
Incentives for customers to get in touch with the firm	0.01	0.04	0.02	0.06	0.07	0.08	0.08
Receipt of direct customer input	0.04	0.11	0.21	0.02	0.04	0.08	
Maximum factor covariance	0.04	0.12	0.22	0.18	0.22	0.08	0.21
AVE for the factor	0.86	0.48	0.48	0.49	0.72	0.47	0.44

Table 4.5b Comparison of Scale AVE with Squared Inter-factor Correlation

Factor covariance	Receipt of direct customer input	Customer Focus	Service Focus	Formal Process for customer contact employees	Training for customer contact employees	Incentives for customer contact employees	Negativity in the direct customer input	Capture of direct customer input
Receipt of direct customer input	0.17	0.03	0.04	0.04	0.14	0.14	0.07	0.08
Customer Focus	0.17	0.18	0.07	0.14	0.10	0.10	0.10	0.23
Service Focus	0.03	0.18	0.10	0.10	0.07	0.07	0.05	0.12
Formal Process for customer contact employees	0.04	0.07	0.10	0.59	0.15	0.04	0.22	
Training for customer contact employees	0.04	0.14	0.10	0.59	0.29	0.00	0.35	
Incentives for customer contact employees	0.14	0.10	0.07	0.15	0.29		0.01	0.24
Negativity in the direct customer input	0.07	0.10	0.05	0.04	0.00	0.01		0.05
Capture of direct customer input	0.08	0.23	0.12	0.22	0.35	0.24	0.05	
Maximum factor covariance	0.17	0.23	0.18	0.59	0.59	0.29	0.10	0.35
AVE for the factor	0.44	0.48	0.49	0.87	0.74	0.81	0.78	0.78

Table 4.5c Comparison of Scale AVE with Squared Inter-factor Correlation

Factor covariance	Industry Clockspeed	Customer Focus	Service Focus	Formal process for indirect customer input capture	Training for indirect customer input capture	Incentives for indirect customer input capture	Negativity in the indirect customer input	Capture of indirect customer input
Industry Clockspeed	0.12	0.00	0.01	0.05	0.07	0.00	0.00	0.04
Customer Focus	0.12	0.18	0.05	0.10	0.10	0.04	0.04	0.05
Service Focus	0.00	0.18	0.10	0.09	0.05	0.01	0.01	0.04
Formal process for indirect customer input capture	0.01	0.05	0.10	0.77	0.49	0.00	0.35	
Training for indirect customer input capture	0.05	0.10	0.09	0.77	0.55	0.00	0.23	
Incentives for indirect customer input capture	0.07	0.04	0.05	0.49	0.55		0.00	0.24
Negativity in the indirect customer input	0.00	0.04	0.01	0.00	0.00	0.00		0.02
Capture of indirect customer input	0.04	0.05	0.04	0.35	0.23	0.24	0.02	
Maximum factor covariance	0.12	0.18	0.18	0.77	0.77	0.55	0.04	0.35
AVE for the factor	0.48	0.48	0.49	0.67	0.87	0.92	0.92	0.67

Table 4.5d Comparison of Scale AVE with Squared Inter-factor Correlation

Factor covariance	Capture of direct customer input	Capture of indirect customer input	Formal process for customer input analysis	Training for customer input analysis	Incentives for customer input analysis	Dissemination of customer input across the firm	Usefulness of UCI insights
Capture of direct customer input		0.03	0.26	0.30	0.19	0.37	0.19
Capture of indirect customer input	0.03		0.12	0.09	0.10	0.07	0.02
Formal process for customer input analysis	0.26	0.12		0.72	0.28	0.69	0.09
Training for customer input analysis	0.30	0.09	0.72		0.40	0.58	0.10
Incentives for customer input analysis	0.19	0.10	0.28	0.40		0.41	0.12
Dissemination of customer input across the firm	0.37	0.07	0.69	0.58	0.41		0.24
Usefulness of UCI insights	0.19	0.02	0.09	0.10	0.12	0.24	
Maximum factor covariance	0.37	0.12	0.72	0.72	0.41	0.69	0.24
AVE for the factor	0.78	0.67	0.75	0.84	0.92	0.60	0.84

Tables 4.6a – 4.6d Convergent, Divergent, and Construct Validity Analysis

Factor correlations	Customer contact frequency	Industry Clockspeed	Customer Focus	Service Focus	Channels for customer contact	Incentives for customers to get in touch with the firm	Receipt of direct customer input
Customer contact frequency		0.06	0.15	-	0.10	0.10	0.20
Industry Clockspeed	0.06		0.35	0.02	0.15	0.19	0.33
Customer Focus	0.15	0.35		0.42	0.47	0.14	0.46
Service Focus	-	0.07	0.02	0.42		0.25	0.15
Channels for customer contact	0.10	0.15	0.47	0.29		0.27	0.21
Incentives for customers to get in touch with the firm	-	0.10	0.14	0.25	0.27		0.29
Receipt of direct customer input	0.20	0.33	0.46	0.15	0.21	0.29	

Table 4.6b Convergent, Divergent, and Construct Validity Analysis

Factor correlations	Receipt of direct customer input	Customer Focus	Service Focus	Formal Process for customer contact employees	Training for customer contact employees	Incentives for customer contact employees	Negativity in the direct customer input	Capture of direct customer input
Receipt of direct customer input		0.41	0.17	0.20	0.19	0.37	0.27	0.29
Customer Focus		0.41	0.42	0.27	0.38	0.31	0.31	0.48
Service Focus	0.17	0.42		0.31	0.32	0.27	0.22	0.34
Formal Process for customer contact employees	0.20	0.27	0.31		0.77	0.39	-0.20	0.47
Training for customer contact employees	0.19	0.38	0.32	0.77		0.54	-0.04	0.59
Incentives for customer contact employees		0.37	0.31	0.27	0.39	0.54		0.09
Negativity in the direct customer input	0.27	0.31	0.22	-0.20	-0.04	0.09		0.22
Capture of direct customer input	0.29	0.48	0.34	0.47	0.59	0.49	0.22	

Table 4.6c Convergent, Divergent, and Construct Validity Analysis

Factor correlations	Industry Clockspeed	Customer Focus	Service Focus	Formal process for indirect customer input capture	Training for indirect customer input capture	Incentives for indirect customer input capture	Negativity in the indirect customer input	Capture of indirect customer input
Industry Clockspeed		0.35	0.02	0.11	0.23	0.27	0.03	0.20
Customer Focus		0.35	0.42	0.23	0.32	0.21	0.20	0.23
Service Focus	0.02	0.42		0.32	0.30	0.23	0.10	0.20
Formal process for indirect customer input capture	0.11	0.23	0.32		0.88	0.70	0.04	0.59
Training for indirect customer input capture	0.23	0.32	0.30	0.88		0.74	0.01	0.48
Incentives for indirect customer input capture	0.27	0.21	0.23	0.70	0.74		0.07	0.49
Negativity in the indirect customer input	0.03	0.20	0.10	0.04	0.01	0.07		0.14
Capture of indirect customer input	0.20	0.23	0.20	0.59	0.48	0.49	0.14	

Table 4.6d Convergent, Divergent, and Construct Validity Analysis

Factor correlations	Capture of direct customer input	Capture of indirect customer input	Formal process for customer input analysis	Training for customer input analysis	Incentives for customer input analysis	Dissemination of customer input across the firm	Usefulness of UCI insights
Capture of direct customer input	0.16	0.51	0.55	0.44	0.61	0.44	
Capture of indirect customer input	0.16	0.34	0.30	0.32	0.27	0.13	
Formal process for customer input analysis	0.51	0.34	0.85	0.53	0.83	0.30	
Training for customer input analysis	0.55	0.30	0.85	0.63	0.76	0.32	
Incentives for customer input analysis	0.44	0.32	0.53	0.63	0.64	0.34	
Dissemination of customer input across the firm	0.61	0.27	0.83	0.76	0.64	0.49	
Usefulness of UCI insights	0.44	0.13	0.30	0.32	0.34	0.49	

Table 4.7 Univariate Normality Check for the Measurement Items

Construct and measurement items	Skewness	Kurtosis
Customer contact frequency		
How frequently does an average customer / user NEED TO interact with the firm during the life cycle of a product / service?	-0.45	-0.80
How frequently does an average customer / user ACTUALLY interact with the firm during the life cycle of a product / service?	-0.40	-0.73
Industry Clockspeed		
In our industry, customers look for new products / services all the time	-0.44	-0.84
In our industry, taste and preferences of customers change very quickly	0.43	-0.90
In our industry, the rate of innovation in products and services is rapid	0.05	-1.28
In our industry, the rate of innovation in operations process is rapid	0.24	-0.90
Customer Focus		
We strive to be highly responsive to our customers' needs	-1.37	1.75
Our organization is more customer focused than are our competitors	-0.48	-0.33
We rapidly attend to complaints from our customers	-1.09	0.84
We view customers as potential and valuable sources of new offering ideas and opportunities	-0.93	0.30
Service Focus		
Our firm offers an explicit product / service guarantee	-0.46	-0.94
The product / service guarantee offered by our firm is the best in the industry	-0.29	-0.62
Our firm has an explicit customer recovery (turning around a negative experience a customer has had with the firm's product / service) policy	0.03	-1.05
Our firm has the most customer-friendly customer recovery policy in the industry	0.01	-0.48
Channels for customer contact		

Number of channels made available to the customers to help them reach the firm (such as in-person, phone, fax, email, internet)	0.08	-0.77
Number of hours for which each channel is available to the customers every day	-0.09	-0.43
Incentives for customers to get in touch with the firm		
Our firm offers monetary incentives to encourage the customers to provide valuable feedback to the firm	1.73	2.06
Our firm offers non-monetary incentives to encourage the customers to provide valuable feedback to the firm	0.52	-1.12
Receipt of direct customer input		
Customers frequently contact us with ideas on how we can do things differently or better	0.01	-0.99
Customers always tell us how well our product / service meets and / or exceeds their expectations	-0.26	-0.85
Formal Process for customer contact employees		
Our firm has formal / written procedures for handling customer contact	-0.62	-1.04
Our customer-contact personnel always follow these procedures for handling customer contact	-0.64	-0.68
Training for customer contact employees		
Our employees are trained in how to handle product / service failures and customer complaints	-0.75	-0.60
Our employees are trained on what customer and incidence details to capture while interacting with the customer	-0.44	-0.91
The training process for customer-contact employees is very structured and formal in our firm	0.01	-1.23
Most of our customer-contact personnel have already received this training	-0.43	-1.09
Incentives for customer contact employees		
Our firm incentivizes customer-contact personnel to do the best they can to fully address a customer concern	-0.03	-1.27
Our firm incentivizes customer-contact personnel to capture all relevant customer and incidence details while interacting with the customer	0.06	-1.19
Negativity in the direct customer input		
The direct customer feedback that we receive in any period is (mostly negative...to...mostly positive)	-0.32	-0.42
The direct customer feedback that we record in any period is (mostly negative...to...mostly positive)	-0.27	-0.57
Capture of direct customer input		
Our customer contact personnel ACTUALLY record most of the complaints received from the customers	-0.79	-0.47
Our customer contact personnel ACTUALLY record most of the suggestions received from the customers	-0.39	-0.86
Our customer contact personnel ACTUALLY capture most of the relevant customer contact details when they record customer feedback	-0.53	-0.68
Formal process for indirect customer input capture		
Our firm has a dedicated department responsible for scanning and recording indirect customer feedback	0.74	-0.89
Scanning and recording indirect customer feedback is part of the formal / written job specification for some of our employees	0.68	-0.99

Our firm has formal / written procedures for scanning and recording indirect customer feedback	0.56	-1.14
Our staff responsible for collecting indirect customer feedback ACTUALLY follows these procedures	0.20	-1.22
Training for indirect customer input capture		
Our staff responsible for collecting indirect customer feedback is trained on how to look for and record indirect customer feedback	0.44	-1.10
The training process for our staff responsible for collecting indirect customer feedback is very structured and formal	0.56	-0.88
Most of our staff responsible for collecting indirect customer feedback have already received this training	0.50	-1.02
Incentives for indirect customer input capture		
Our firm incentivizes these employees to scan as many instances of indirect customer feedback as possible	0.87	-0.23
Our firm incentivizes these employees to record as many actionable instances of indirect customer feedback as possible	0.82	-0.39
Negativity in the indirect customer input		
The indirect customer feedback that we scan in any period is	-0.07	-0.16
The indirect customer feedback that we record in any period is	-0.19	0.03
Capture of indirect customer input		
Our firm scans social media such as Facebook and Twitter for indirect customer feedback	0.54	-1.20
Our firm scans the press and other public domain areas for indirect customer feedback	-0.29	-1.41
Our firm scans online forums related to our business for indirect customer feedback	0.12	-1.43
Formal process for customer input analysis		
Our firm has a dedicated department that analyzes customer feedback	-0.01	-1.45
Our firm has formal / written rules and procedures for analyzing customer feedback	0.05	-1.27
Evaluation of customer feedback is a formal activity in our firm	-0.56	-0.95
Training for customer input analysis		
These employees are trained on how to analyze customer feedback	0.07	-1.28
The training process for the employees responsible for analyzing customer feedback is very structured and formal	0.21	-1.14
Most of the employees responsible for analyzing customer feedback have already received this training	0.10	-1.18
Incentives for customer input analysis		
Our firm incentivizes these employees to analyse as many instances of customer feedback as possible	0.51	-0.88
Our firm incentivizes these employees to find as many actionable customer insights as possible	0.48	-0.95
Dissemination of customer input across the firm		
Our firm uses structured channels and formal mechanisms to share customer insights across the firm	0.09	-1.26
Customer feedback data is regularly disseminated at all levels in our firm	-0.20	-1.19
Usefulness of UCI insights		
The feedback provided by the customers is generally useful for improving the products / services concerned	-1.14	1.61

The feedback provided by the customer is generally useful for designing new products / servicesc	-0.87	0.42
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Table 4.8 Fit Measures for the Measurement Models

Model	χ^2	df	χ^2/df	NFI	TLI	CFI	IFI	GFI	AGFI	RMR	1-RMSEA
Factors affecting receipt of direct customer input	45.26	29	1.56	0.95	0.97	0.98	0.98	0.97	0.94	0.04	0.96
Factors affecting capture of direct customer input	36.79	35	1.05	0.97	0.99	0.99	0.99	0.97	0.95	0.03	0.98
Factors affecting capture of indirect customer input	59.03	48	1.23	0.95	0.99	0.99	0.99	0.93	0.89	0.04	0.96
Factors affecting extraction of UCI insights useful for NSD	37.51	36	1.04	0.97	0.99	0.99	0.99	0.96	0.93	0.03	0.98

Table 4.9 χ^2 -difference Test between Measurement Model and Theoretical Model

Model	Measurement Model		Full Model		Difference	
	χ^2	df	χ^2	df	χ^2	df
Factors affecting receipt of direct customer input	45.26	29	50.84	32	5.59	3
Factors affecting capture of direct customer input	36.79	35	36.79	35	-	0
Factors affecting capture of indirect customer input	59.03	48	59.81	49	0.78	1
Factors affecting extraction of UCI insights useful for NSD	37.51	36	40.64	38	3.13	2

^a χ^2 difference <3.84 for df = 1, < 5.99 for df = 2, and < 7.82 for df = 3 are statistically insignificant at p = 0.05

Table 4.10 Standardized Estimates and Critical Ratios

Latent variable relationship	Standardized loading	Critical ratio
Causal relationships		
γ_1 - Customer contact frequency to Receipt of direct customer input	0.23	3.58
γ_2 - Customer focus to Receipt of direct customer input	0.44	5.30
γ_3 - Incentives for customers to get in touch with the firm to Receipt of direct customer input	0.25	3.37
γ_9 - Service focus to Capture of direct customer input	0.12	1.73
γ_{12} - Incentives for customer contact employees to Capture of direct customer input	0.30	4.72

γ_{14} - Tolerance of negative customer input to Capture of direct customer input	0.21	3.37
γ_{15} - Slack available for direct customer input capture to Capture of direct customer input	0.38	6.12
γ_{20} - Training for indirect customer input capture to Capture of indirect customer input	0.27	2.07
γ_{21} - Incentives for indirect customer input capture to Capture of indirect customer input	0.29	2.18
γ_{25} - Formal process for customer input analysis to Usefulness of UCI insights	-0.66	-2.80
γ_{31} - Dissemination of customer input across the firm to Usefulness of UCI insights	1.13	4.50
Correlations		
ϕ_1 - Slack available for direct customer input capture and Service focus	0.29	3.18
ϕ_2 - Slack available for direct customer input capture and Incentives for customer contact employees	0.27	3.50
ϕ_3 - Slack available for direct customer input capture and Tolerance of negative customer input	0.45	5.96
ϕ_4 - Service focus and Incentives for customer contact employees	0.34	3.34
ϕ_5 - Service focus and Tolerance of negative customer input	0.39	3.83
ϕ_6 - Incentives for customer contact employees and Tolerance of negative customer input	0.29	3.68
ϕ_7 - Training for indirect customer input capture and Customer focus	0.32	2.80
ϕ_8 - Training for indirect customer input capture and Incentives for indirect customer input capture	0.74	6.61
ϕ_9 - Customer focus and Incentives for indirect customer input capture	0.21	1.96
ϕ_{10} - Dissemination of customer input across the firm and Capture of direct customer input	0.65	5.88
ϕ_{11} - Dissemination of customer input across the firm and Slack available for customer input analysis	0.63	6.03
ϕ_{12} - Dissemination of customer input across the firm and Formal process for customer input analysis	0.86	6.80
ϕ_{13} - Capture of direct customer input and Slack available for customer input analysis	0.45	5.13
ϕ_{14} - Capture of direct customer input and Formal process for customer input analysis	0.50	5.30
ϕ_{15} - Slack available for customer input analysis and Formal process for customer input analysis	0.49	5.48

Note: For one-tailed tests of significance, critical ratio (CR) = |1.65|, p<0.05; CR = |2.33|, p<0.01; CR = |3.10|, p<0.001

Chapter 5. The antecedents and the impact of using Unsolicited Customer Input-driven insights in NSD

5.1 Introduction

The essay presented in chapter 4 examined in detail the operational processes that allow an organization to obtain innovation-driving insights from the Unsolicited Customer Input. This sets the stage for the next phase of analysis that empirically tests the propositions put forward in chapter 3 regarding the factors that affect the use of these insights in NSD, and the impact of such use on NSD outcomes. The empirical analysis conducted in this chapter uses the data that was collected as part of the same survey through which the data used in chapter 4 was also collected. Therefore, references are made throughout this chapter to the relevant sections of chapter 4 to avoid duplication of information whenever possible.

The rest of this chapter is organized as follows. Next section describes the conceptual framework related to the research focus described above. The research methodology is presented next, and includes the process followed for developing the constructs; scale development, validation, and refinement; data collection including sample selection, survey administration, and validation and robustness checks on the data collected through the survey. This is followed by a description of the data analysis including the initial model, the refined model, and the model fit statistics. Finally, the results are presented, and show a strong link between specific internal firm factors such as the operational processes designed to facilitate receipt, capture, analysis, and dissemination of customer input across the firm, negativity in the feedback received, and customer and employee incentives, and the organization's ability to successfully leverage customer input as a driver of service innovation. It also shows a strong, positive impact of the utilization of customer input in service innovation on the nature, speed, and success of the firm's innovation efforts.

5.2 Conceptual Framework and Propositions

While potentially beneficial, the use of insights contained in the Unsolicited Customer Input is not a trivial task for the firm. The firm does not always receive unsolicited input from its customers, and the input may or may not be given directly to the firm. The input that does come to the firm may get filtered as it moves through a multitude of departments before finding its way to the NSD function within the firm. Here, the input may or may not relate to the current set of NSD initiatives, and may be discarded / put away for possible future use. In this chapter we address two sets of factors surrounding the use of insights derived from the Unsolicited Customer Input in NSD. First, we argue that this depends on the degree to which companies actually utilize the insights derived from the Unsolicited Customer Input in their NSD processes. Second, we argue that utilizing the Unsolicited Customer Input has a significant impact on the NSD outcomes.

5.2.1 The use of insights derived from the Unsolicited Customer Input in NSD

There are a number of factors that may impact a firm's use of insights derived from the Unsolicited Customer Input in NSD:

Availability and usefulness of UCI insights for the NSD team: While the firm may want the customer to provide input to the firm, not all customers choose to spend the time and effort required to provide unsolicited inputs to the firm. Even when they do, the input may not be given directly to the firm (Tax and Brown, 1998), and may not be open and honest (Voss et al., 2004). The structural disconnect between those who receive the unsolicited input and those who need to utilize the insights derived from this input into NSD activities, and the additional challenges posed by the lack of control the firm has over when, where, how, and who provides such input, make it very difficult for the firm to leverage Unsolicited Customer Input as a source of ideas for service innovation. Therefore, availability of UCI-based insights for the NSD team cannot be taken for granted, and may vary widely across different firms. This availability of UCI-based insights may have a strong impact on the extent to which an organization is able to utilize Unsolicited Customer Input in its NSD activities. This leads to the following proposition:

P1: Availability and usefulness of UCI-based insights for the NSD team leads to a greater utilization of Unsolicited Customer Input in NSD

Industry Clockspeed: As described earlier, today's service firms face a very dynamic environment characterized by rapid change and heightened levels of competition (Bitner et al., 2000; de Brentani, 1995). This pace of change within the industry and frequency with which the firms need to innovate have been characterized by a clockspeed that gauges the velocity of change in the external business environment and sets the pace of the firms' internal operations (Mendelson and Pillai, 1998; Mendelson and Pillai, 1999). Firms that operate in the high industry clockspeed environment may need to innovate more frequently and at a faster pace than do the firms that operate in a slow industry clockspeed environment. Therefore, the high industry clockspeed may encourage the firm to utilize Unsolicited Customer Input in NSD as a way to support the firm's innovation efforts. This leads to the following proposition:

P2: High industry clockspeed leads to a greater utilization of Unsolicited Customer Input in NSD

Customer Focus: An organization's concern for its customers is reflected in the policies and practices adopted by the firm. When the organization has a set of beliefs that puts the customers' interests first, the organization is said to be "customer oriented" or "customer focused" (Schneider et al., 1998). This customer focus drives the organization to determine customer satisfaction with its existing products and services, assess current and emerging customer requirements and expectations, and provide effective customer relationship management (Evans and Lindsay, 2010; Samson and Terziovski, 1999). Firms that have a strong customer focus go to great lengths to ensure that they provide excellent service to their customers and meet or exceed customer expectations (Bowen et al., 1989; Kelley, 1992; Lytle et al., 1998; Schneider and Bowen, 1995; Schneider et al., 1992). These firms may value the Unsolicited Customer Input as a way to ensure that their service innovations are always driven by the customers' needs. Therefore, strong customer focus may lead to a greater utilization of Unsolicited Customer Input in NSD. This leads to the following proposition:

P3: Higher levels of customer focus lead to a greater utilization of Unsolicited Customer Input in NSD

Appropriate training and incentives for the NSD team to utilize Unsolicited Customer Input in NSD: The lack of focus and resulting dispersed nature of the information contained in the unsolicited input may make utilization of these insights very effort-intensive and difficult for the firm (Koca and Brombacher, 2008). Also, the highly dispersed information contained in the feedback may not solely relate to the current or planned set of offerings or capabilities of the firm, making it very likely to be discarded by those looking at the input. Even after the insights are extracted, the time-lag between the capture and potential opportunities for utilization that may come up in the future results in the need to code, classify and store the insights to facilitate search and retrieval in the future, which adds another layer of complexity for the firm. Finally, the ad-hoc nature of NSD processes that many service firms tend to follow (Cooper et al., 1994; de Brentani, 1989; Griffin, 1997a; Griffin, 1997b; Menor et al., 2002; Shostack, 1984), risk the entire effort going waste if the NSD teams do not actually take the time to search and utilize potentially useful insights from the repository of such Unsolicited Customer Input-based insights.

People drive organizational activities including innovation projects, and are therefore a critical component for NSD (Johne and Storey, 1998). Given the above-described challenges posed by the use of UCI-based insights in NSD, hiring and training NSD personnel that have the necessary skills and a customer-centric attitude in addition to properly aligning incentives for these employees may be crucial in realizing the desired customer-centric attitude and behaviour from the employees (Benoy, 1996; Berry et al., 1994; Heskett et al., 1990; Lytle et al., 1998; Schlesinger and Heskett, 1991; Schneider and Bowen, 1993). Therefore, appropriate training and incentives for the NSD team to utilize Unsolicited Customer Input in NSD may positively affect a firm's utilization of Unsolicited Customer Input in NSD. This leads to the following two propositions:

P4: Training for using UCI-based insights in NSD leads to a greater utilization of Unsolicited Customer Input in NSD

P5: Incentives for the NSD personnel to use UCI-based insights in NSD leads to a greater utilization of Unsolicited Customer Input in NSD

Resources devoted to NSD: Success of a new service depends on how well the service satisfies an unmet need of its target customers. This requires the firm to develop an understanding of the customer wants, needs, and preferences apart from assessing the competitive landscape in terms of the existence of any competitor service offering that can satisfy such a need, and have the ability to develop and deliver a service that can meet this need. While customer involvement in NSD is considered a highly effective way for the firm to understand the customer wants, needs, and preferences, it's not the only way a firm can go about this. The lack of control a firm has over when, where, how, and who provides such input, make it very difficult for the firm to rely on Unsolicited Customer Input as a source of ideas for service innovation. Therefore, the firms that are in a position to devote a lot of resources to its NSD efforts may choose to ignore the Unsolicited Customer Input in favour of other, more predictable ways of learning about customer needs. This leads to the following proposition:

P6: More resources devoted to NSD leads to a lesser utilization of Unsolicited Customer Input in NSD

Negativity in Unsolicited Customer Input: One of the barriers to a firm's ability to utilize Unsolicited Customer Input is the negativity that generally surrounds most of the unsolicited feedback. Especially for the service firms, if those who receive negative feedback are part of the same service encounter that leads to a negative input, they may feel uneasy about recording or communicating that input further (Tax and Brown, 1998). While the input travels across the firm, the negativity that generally surrounds the unsolicited input may also result in resistance and distortion of the message across process stages within the firm (Fornell and Westbrook, 1984; Homburg and Fürst, 2005; March and Simon, 1958; Matlin and Stang, 1978; O'Reilly and Roberts, 1974; Read, 1962; Roberts and O'Reilly, 1974; Rosen and Tesser, 1970; Tesser and Rosen, 1975). However, once the unsolicited input reaches the NSD team, the negativity in the input may spur greater utilization of Unsolicited Customer Input in NSD as the management may see the negative customer input as a strong indication of the need to change things. Therefore, the negativity in Unsolicited Customer Input may have a significant impact on the extent to which a firm utilizes the Unsolicited Customer Input in NSD. This leads to the following proposition:

P7: Negativity in Unsolicited Customer Input affects the utilization of Unsolicited Customer Input in NSD

Figure 5.1 captures these seven propositions that relate to the factors affecting a firm's utilization of Unsolicited Customer Input in NSD:

5.2.2 Impact of Unsolicited Customer Input utilization in NSD:

NSD Outcomes:

Firms seem to measure NSD outcomes along three dimensions: NSD Success, NSD Speed, and Type of Innovation pursued:

NSD Success: The process of innovation starts when an organization senses an opportunity to create and / or satisfy a need in the market place (Pilzer, 1990). There are many ways in which an organization can sense this potential, and each of these sources of innovation plays a role in an organization's ability to innovate. A fit between the organizational strategy and the internal and external environments is a significant determinant of innovation performance (Anderson and Zeithaml, 1984; Atuahene-Gima, 1996; Miles et al., 1978; Venkatraman and Prescott, 1990). Therefore NSD is conceptualized as a strategic response to internal and external environments; and success is determined by the efficient alignment of the resources and the process activities to these environments (Miles et al., 1978).

NSD Speed: Unlike the product innovations that are protected by the IP rights and patents, service innovations are copied quickly in service industries (Alam and Perry, 2002; Johne and Storey, 1998). Therefore, NSD cycle time is one of the important issues faced by service firms across the world. The time required by a firm to develop a new service, captured in the NSD Speed construct, is an important determinant of new service performance, especially in industries that are characterized by high clockspeed.

Type of Innovation Pursued: Service innovations have been classified as incremental or radical by many researchers (e.g. Johnson et al., 2000; Oke, 2007). Here, "incremental" innovation refers to an addition of new features to improve upon an existing offering (i.e., a product, service, or experience), and "radical" innovation refers to a real new offerings not previously

available to an organization's existing customers. In addition to the customer-related newness (de Brentani, 2001), the degree of newness can also be related to existing service systems or concepts (Gallouj and Weinstein, 1997; Menor et al., 2002), or to the degree of change (Ettlie et al., 1984) in the delivery process which is new not only to the customers, but also to the organization, the market, or the industry (Berry et al., 2006). It is argued that while incremental innovations result in minor improvements or simple adjustments to a product or service, radical innovations generate fundamental changes in the activities of an organization, a market, or even an entire industry (Garcia and Calantone, 2002).

Resources devoted to NSD: A firm has to plan for and make available appropriate resources for specific NSD efforts (Menor and Roth, 2007). Resources devoted to NSD include firm personnel, monetary investment, and firm infrastructure including knowledge of the competitive landscape. Deployment of these resources can allow the firm to ensure that the new service offering's characteristics and its delivery match the customer needs and expectations. Through the availability and effective deployment of these resources, a firm can pursue multiple ideas simultaneously for developing new services. Given the need to try many new ideas quickly in a fast-paced environment, a firm can improve its chances of achieving new service success by ensuring that necessary resources are available and deployed in NSD. In other words, resources devoted to NSD may positively affect new service success and reduce the development cycle time for a firm.

In addition, the extent to which the resources are devoted to NSD may also have an impact on the type of innovation pursued by the firm. Incremental innovations are minor changes to the firm's existing products or services that usually do not require the firm to stretch its boundaries of competence and resources. On the other hand, radical innovations take the firm away from its comfort zone of existing products and services, and usually require the firm to take considerable risk by devoting a lot of resources on ideas that take the firm into untested waters with no guarantees of success. Therefore, only those firms that devote a lot of resources to NSD may be able to pursue radical innovation. This suggests that resources devoted to NSD can affect the type of innovation pursued by the firm. This leads to the following three propositions:

P8: Resources devoted to NSD positively impact NSD Success

P9: Resources devoted to NSD positively impact NSD Speed

P10: Resources devoted to NSD impact the Type of innovation pursued by the firm

Utilization of (solicited and unsolicited) customer input and NSD Outcomes: Understanding customer needs is a vital part of any NSD process (Stevens and Dimitriadis, 2005). It has been argued that business success depends on an organization's ability to imagine and /or create a need (Pilzer, 1990). Involving customers in NSD activities may allow the firm to learn directly from the customers about their requirements and needs, reduce the gap between such needs and the firm's understanding of these needs, and positively affect new service performance (e.g. Alam, 2006a; de Brentani, 1991, 1995; de Brentani and Cooper, 1992; Edgett, 1994). Customer involvement in NSD is considered by most researchers to be not only useful, but also vital for the success of an NSD process (de Brentani, 1991; Matthing et al., 2006; von Hippel and Katz, 2002). It has been argued that interaction with the customers is a necessity for successful innovation (e.g. McKenna, 1995; Wind and Mahajan, 1997). Customer involvement

is considered especially important during the initial and final stages of the NSD process which correspond to idea generation and service launch (Alam and Perry, 2002; von Hippel, 1986).

The suggested benefits of customer involvement in NSD include a superior capture of market information in product or service design through a firsthand contact with the customers (Biemans, 1992; Gemunden et al., 1992; Li and Calantone, 1998; Matthing et al., 2006; Souder, 1988) that leads to an increase in new service performance (e.g. de Brentani, 1991, 1995; de Brentani and Cooper, 1992; Edgett, 1994), as well as an increase in the innovativeness and final success of the product or service (Biemans, 1992; Deschamps and Nayak, 1995; Gales and Mansour-Cole, 1995; Gemunden et al., 1992; Griffin and Hauser, 1993; Håkansson and Snehota, 1995; Lukas and Ferrell, 2000; McKenna, 1995; von Hippel, 1978, 1986). Customer involvement may lead to new product ideas, enhanced product development effectiveness, and even reduced time to market for new products (e.g. Alam and Perry, 2002; Campbell and Cooper, 1999). Customers can make the firm aware of their unmet needs that would have otherwise taken longer for the firm to realize by itself, create a sense of urgency for the development of ideas that the firm has already had by signaling the value of the idea to the firm, and eliminate the need to conduct market research to validate the ideas. Collectively, this may lead to the firm developing innovations at a faster pace.

A close relationship with the customers presents firms with a potential paradox. According to the social networks theory, although close customers have a greater motivation to cooperate, they cannot provide the firm access to potentially rich and diverse information (Granovetter, 1982; Krackhardt, 1992) that is necessary to drive radical innovation. Some argue that it can be hard for the customers to envision something that they have never experienced before (Flint, 2002; Matthing et al., 2006; Ulwick, 2002). While customer insights may have many new ideas, the input that contains these insights is given to the firm in the context of an encounter a customer has had with an existing service offering of a firm. Therefore, the insights are more likely to contain very few ideas that require the firm to stretch the boundaries of its current capabilities, and many ideas that improve the existing services or offer something new along the lines of other existing offerings (Brockhoff, 2003). This suggests that customer feedback-driven NSD may lead to incremental improvements of existing solutions rather than to radically new breakthrough products and services (Christensen, 1997; Leonard-Barton, 1995; Nambisan, 2002; Rothwell et al., 1974; Ulwick, 2002; von Hippel, 1988).

Collectively, this suggests that the customer involvement in NSD through the use of solicited and unsolicited customer feedback may lead to a shorter service development cycle, greater new service success, and a higher probability of the firm pursuing incremental innovations. This leads to the following six propositions:

P11: Utilization of Unsolicited Customer Input in NSD positively impacts NSD Success

P12: Utilization of Unsolicited Customer Input in NSD positively impacts NSD Speed

P13: Utilization of Unsolicited Customer Input in NSD impacts the Type of innovation pursued by the firm

P14: Utilization of Solicited Customer Input in NSD positively impacts NSD Success

P15: Utilization of Solicited Customer Input in NSD positively impacts NSD Speed

P16: Utilization of Solicited Customer Input in NSD impacts the Type of innovation pursued by the firm

Tolerance of failure and NSD Outcomes: An innovation climate (Atuahene-Gima, 1996) that promotes experimentation, risk taking and tolerates failure may encourage the NSD team to stretch the boundaries and pursue radically new services that require the firm to significantly depart from the existing capabilities of the firm (Johne, 1993; Schneider et al., 1998). In the absence of such an innovation climate, the NSD team may simply discard the radical ideas in favour of the ideas that refine existing services and result in just marginally different new services. Therefore, tolerance of failure in the firm may impact the type of innovation pursued. Also, such tolerance of failure may affect the time taken by the firm to develop new services since a lower tolerance of failure may motivate the NSD personnel to cover all bases before introducing a new service into the market. This reluctance to introduce new services into the market place for which the NSD team is not sure of the potential for success may also result in the introduction of only those services for which the probabilities of success are very high. So, the tolerance of failure within a firm may have a significant impact on NSD outcomes such as NSD Success, NSD Speed, and the Type of innovation pursued. This leads to the following three propositions:

P17: Tolerance of failure within the firm affects NSD Success

P18: Tolerance of failure within the firm affects NSD Speed

P19: Tolerance of failure within the firm affects Type of innovation pursued

Figure 5.2 captures these propositions that relate to the factors affecting NSD outcomes for a firm.

5.3 Scale Development and Data Collection

As described in section 4.4 in further detail, a multi-item scale was developed specifically for the purpose of this study. Following the commonly prescribed approach (Ahmad and Schroeder, 2003; Ahmed et al., 1996; Alam, 2006b; Menor and Roth, 2007, 2008), we combined measurement items used in existing literature with measurement items developed specifically for this study. These items were then subjected to three rounds of item-to-construct sorting exercises (Menor and Roth, 2008; Wacker, 2004) to assess interrater reliability, substantive validity and construct validity of measurement items. Finally, responses obtained from service firm executives through a large-scale survey of service firms were used to measure reliability and validity of each of the scales.

5.3.1 Item generation and item sorting analysis

We examined the extant literature from 1990 to 2010 to identify suitable measurement items. This included a review of article abstracts followed by an in-depth examination of relevant articles that allowed us to identify 55 potential items. After eliminating items for lack of clarity, relevance, and presence of undesirable similarity to other items, we used item-sorting analysis to establish content validity of the items. To further assess scale reliability and validity (including construct validity and criterion validity), we utilized the responses received through

a large-scale survey of service firms. For additional details on the item generation and item sorting analysis, please refer to section 4.4.1.

5.3.2 Survey Instrument

The data used for this study were part of a broader and more comprehensive survey that dealt with both process-related and outcome-related factors that influence the utilization of Unsolicited Customer Input in NSD activities. The questions were divided into sections that focused on firm environment (competition, innovation and customers), direct customer feedback, indirect customer feedback, analysis of customer feedback, utilization of customer feedback in NSD, firm demographics, and respondent demographics. For more details on the survey instrument, please refer to section 4.4.2. The survey instrument including the directions given to the respondents and the questions asked can be found in Appendix 5.

5.3.3 Sample and data collection

The items retained from the previous step were administered to a large sample of service firms, and the measurement reliability and validity was confirmed by analysing these survey responses. For further details of the sampling frame, the data collection procedures followed, and the checks performed to rule out non-response and method-of-response biases, please refer to section 4.4.3.

5.3.4 Reliability and validity analysis

Exploratory Factor Analysis (EFA), and Confirmatory Factor Analysis (CFA) were then performed to assess uni-dimensionality and to measure the reliability and validity of each multi-item scale (Ahire and Devaraj, 2001; O'Leary-Kelly and J Vokurka, 1998).

5.3.4.1 Reliability and Validity

Scale reliability is the proportion of variance attributable to the true score of the latent variable. Two important facets of scale reliability include the internal consistency reliability and the temporal stability reliability. Scale validity analysis includes an assessment of face validity, construct validity, convergent and discriminant validity, and consequential validity.

Internal consistency reliability is concerned with the homogeneity of the items within a scale. Scales based on classical measurement models are intended to measure a single phenomenon. Measurement theory suggests that the relationships among items are logically connected to the relationships of items to the latent variable. If the items of a scale have a strong relationship to their latent variable, they will have a strong relationship to one another. A scale is internally consistent to the extent that its items are highly intercorrelated. Internal consistency is typically equated with Cronbach's (1951) coefficient alpha.

Temporal stability reliability refers to the extent to which the scores remain constant from one occasion to another. Test-retest reliability is the method typically used to assess this. Correlation of scores obtained across two administrations of a scale to the same individuals should represent the extent to which the latent variable determines observed scores. Nunnally

(1978) pointed out that characteristics of the items might cause them to yield temporally stable responses even when the construct of interest has changed. Kelly and McGrath (1988) identified four factors that are confounded when one examines two sets of scores on the same measure, separated in time. These include real change in the construct of interest, systematic oscillations in the phenomenon, changes attributable to differences in subjects or measurement methods, and temporal instability due to the inherent unreliability of the measurements. Only the fourth one is unreliability. Although multi-trait, multi-method matrix approach can help, it is argued that it may never be possible to unconfound these factors fully (DeVellis, 2003).

5.3.4.2 Exploratory Factor Analysis

Principal Component Analysis (PCA) using maximum likelihood estimation was performed for each latent construct. While it would have been more correct to use factor analysis instead of component analysis, component analysis was preferred here because in most situations, component analysis and factor analysis give nearly identical solutions; and estimation methods available for factor analysis are often unsatisfactory when calculation of a score is required (Blunch, 2008).

If a number of items make up a reliable summated scale, a component analysis should show that the first (un-rotated) component accounts for a large share of the total variance in the items, and each of the following components accounts for a very small share of the total variance. The communality is the part of the variance of a measurement that it has in common with the latent variable it is supposed to measure, and should therefore also be high, ideally greater than 0.6. When the items are factor analyzed, the initial premise is that a single factor (i.e. the latent construct) can adequately account for the pattern of correlations among the items. This amounts to a provisional assertion that a model that has a single latent variable (i.e. a single factor), with a separate path emanating from it to each of the items, is an accurate representation of the underlying causal relationships.

In factor analysis, determining how many factors to extract can be a knotty issue (Zwick and Velicer, 1986). Two widely used non-statistical guidelines for judging when enough number of factors have been extracted are the eigenvalue rule (Kaiser, 1960), and the scree test (Cattell, 1966). According to the eigenvalue rule, factors with eigenvalues less than 1.0 (and therefore, containing less information than the average item) should not be retained. According to the scree test rule, factors that lie above the elbow should be retained (done by plotting eigenvalues of factors on a graph in a descending order, and then determining where the graph goes from relatively vertical to relatively flat). For each multi-item scale, both of these tests were used to confirm that only one factor should be extracted for each measurement scale, indicating the unidimensionality of the scales. After confirming the unidimensionality, internal reliability of the scale was calculated by measuring Cronbach's alpha. A value of 0.7 or more for the Cronbach's alpha was used as a criterion for a reliable scale (Nunnally, 1978). Table 5.1 shows various measures of scale reliability described above.

5.3.4.3 Confirmatory factor analysis:

Since exploratory factor analysis has known limitations (large Cronbach's alpha no guarantee for uni-dimensionality of the scale, every manifest variable connected with every latent variable, limited possibilities for statistical testing), we also subjected our data to confirmatory

factor analysis. Prior to performing confirmatory factor analysis, all of the items were further analysed for violations to multivariate normality and kurtosis (West et al., 1995); no violations were detected. Confirmatory factor analysis was then performed to further assess scale unidimensionality, reliability, and validity. Measurement models of each multi-item scale were constructed and estimated while allowing the errors to freely correlate with each other (see table 5.2 for a listing of the fit indices for each of the scales). All chi-square values were non-significant, indicating that the measurement models are consistent with the data and show acceptable overall goodness of fit. Since the exclusive use of chi-square statistic in evaluating overall model fit is considered problematic by many researchers (Bentler and Bonett, 1980; Bollen and Long, 1993; Jöreskog and Sörbom, 1993; Kenny and McCoach, 2003; MacCallum, 1990; McIntosh, 2007), we also looked at other absolute as well as incremental goodness-of-fit (GOF) measures. As shown in table 5.2, all of these fit indices for each of the multi-item scales were higher than 0.9, indicating the scale unidimensionality by generally accepted standards. We then computed the reliability and convergent validity of each multi-item scale by computing composite reliability and average variance extracted (AVE) measures. Composite reliability is calculated by using standardized factor loadings of the construct on each of the items (see table 5.3), and a value of 0.7 or above indicates acceptable scale reliability (Bagozzi and Yi, 1988). All (except two, which are very close to, but slightly below 0.7) of the composite reliability values exceeded the 0.70 standard, indicating that these items sufficiently represent their respective constructs. AVE (Fornell and Larcker, 1981) is a measure of the error-free variance of a set of items, and is used as a measure of convergent validity (Dillon and Goldstein, 1984). All (except three, which are very close to, but slightly lower than 0.5) of the AVE values exceeded the 0.50 standard, indicating that more than half of the variance in the items is captured by each construct (as opposed to the measurement error).

We assessed convergent validity by examining the magnitude and sign of the factor loadings of the items (see table 5.3). All of the standardized loadings are in the anticipated direction, and are statistically significant (most at $p < 0.01$ and a few at $p < 0.05$).

Discriminant validity of the multi-item scales was assessed in three ways – the chi-square difference test, the variance extracted test, and the confidence interval test. First, we estimated 86 (43 constrained, and 43 unconstrained) models, and conducted 43 chi-square difference tests of nested models (see table 5.4). This involved running confirmatory factor analysis (CFA) on pairs of constructs. For the unconstrained model, the latent factors were allowed to correlate freely whereas for the constrained model, the latent factors were constrained to have a correlation of one. χ^2 differences for 38 out of the 43 pairs are statistically significant (see table 5.4), indicating that the proposed scales capture unique constructs. We address the discriminant validity of the remaining five pairs by conducting two other checks described below.

In the second step, we compared the average variance extracted (AVE) value for each construct with the square of its unconstrained correlation with each of the remaining constructs. As shown in table 5.5, the AVE value for each construct is higher than the unconstrained correlation of that factor with each of the other factors, showing that the variance extracted by the latent construct is higher than what can be attributed to other correlated constructs. This indicates that the particular construct is distinct from each of the other constructs, and establishes its discriminant validity (Fornell and Larcker, 1981; Netemeyer et al., 1990).

Finally, we performed a confidence interval test for each possible pair of latent factors to further assess the discriminant validity of factors. We calculated confidence intervals of plus or

minus 2 standard errors around the correlation between each factor pair, and checked whether this interval includes +/-1.0. None of the confidence intervals includes 1.0, demonstrating discriminant validity for each of the latent factors (Anderson and Gerbing, 1988; Hatcher, 1994). Together, these tests provide strong support for the discriminant validity of most of the factors, and mixed support for the discriminant validity of "Industry clockspeed". As argued by Hatcher (1994), a model's fit need not meet all of the criteria in order to be deemed acceptable since these characteristics represent an ideal that very often can't be attained with real-world data even when the measurement model is quite good.

To establish convergent, divergent, and construct validity, we looked at the unconstrained correlations of latent factor pairs (table 5.6). If factors are convergent valid, there should be good correlation between the constructs that are theoretically connected. Divergent validity dictates that the constructs that are not theoretically connected should show very little correlation. Construct validity requires that the direction of movement for each latent construct is in line with the expected movement of the latent variable to the movement in other variables. As shown in table 5.6, all of the constructs show good convergent, divergent, and construct validity. For example, "Usefulness of UCI insights" is strongly correlated with "Customer Focus", "Utilization of UCI in NSD", and "Utilization of SCI in NSD" as expected, establishing convergent validity. Non-significant correlations between "Usefulness of UCI insights", "Industry clockspeed", and "Tolerance of failure" indicate divergent validity. Statistically significant and strong correlation between "Usefulness of UCI insights" and "NSD Success" shows construct validity.

Consequential validity (Messick, 1995) was established by ensuring that the respondents did not feel compelled to choose the answer to the survey questions by considering how the resulting response would make their firm look in the eyes of the researchers, firm stakeholders, and those who access this research later on. This was done in two ways. First of all, all respondents were assured that the respondent and the firm identity would not be disclosed to anyone outside of the team involved with the research. Second, particular attention was paid to the wording of the questions to ensure that the questions did not lead the respondent to choose a specific response.

This analysis led to the retention of 11 multi-item measurement scales consisting of 33 items. A brief description of the items along with a representative list of existing literature that motivated the items can be found in Appendix 4. Figures 5.3 and 5.4 show the resulting research models.

5.4 Data Analysis

Data were analysed using Structural Equation Modelling (SEM) technique using a total disaggregation approach which treats each item as a separate indicator of the relevant construct (Bagozzi and Edwards, 1998; Marsh and Hocevar, 1985). For details of the two-step procedure followed in this analysis, please refer to section 4.5. The following sections describe the SEM analysis done using SPSS' AMOS, including the tests of statistical assumptions, model identification, and outcomes achieved.

5.4.1 Statistical Assumptions

While 350 out of the 402 total survey responses were received through the online survey platform which required the respondent to answer every question, remaining 52 responses were received through email / post that allowed the respondents to skip questions at their will. This resulted in a dataset with missing data for a small number of responses. Faced with the choice of either excluding the incomplete responses from the analysis or using estimation method that can handle missing data, we chose the latter since excluding the incomplete responses would have resulted in a smaller sample, and would have decreased the power of the statistical tests.

Unlike Listwise Deletion (LD) that reduces the sample size, Pairwise Deletion (PD) that results in different measures based on different samples, Mean Imputation (MI) that reduces the variance, and Regression Imputation (RI) that estimate the value of the missing observation by regressing the variable on all other variables, Full Information Maximum Likelihood (FIML) estimation method uses all available information, and is therefore statistically the most efficient method. However, FIML estimation necessitates estimation of means and intercepts and eats up degrees of freedom. Therefore, the measurement model and the causal model cannot be estimated at the same time. While FIML gives unbiased estimates only when the data are Missing Completely At Random (MCAR) – i.e. the probability that a value is missing is independent of one and every variable measured or missing (Rubin, 1976), it still gives efficient and consistent estimates even when the data are Missing at Random (MAR) – i.e. the probability that a measurement is missing is independent of its value, conditional on the values of the measured variables. If the MAR condition is not met, FIML estimation may not be consistent, but is still less biased than the other solutions to the missing data problem.

Also, the Maximum Likelihood estimation is based on an assumption of multivariate normality of the manifest variables. If this assumption is not met, consequences include convergence problems, underestimation of the variance, inflation of the χ^2 statistic, upward bias in critical values used in determining significance (West et al., 1995), and an underestimation of the standard errors of parameter estimates (Blunch, 2008). However, this risk is reduced with a large sample ($n>200$) (Tabachnick and Fidell, 2007). Normality is also important for the generalizability of results beyond the sample used. Even though our sample size is large ($n=402$), we decided to examine the univariate normality of the variables in order to rule out the possibility of an issue with the multivariate normality assumption. As shown in table 4.7, none of the items exhibits skewness or kurtosis values in excess of $|2|$, and therefore, do not pose a threat to the assumption of multivariate normality.

5.4.2 Model Identification

Structural Equation Modelling analysis is based on covariance matrices. Therefore, it is important to assess model identification of the hypothesized model to ensure that the model as specified has a unique solution. This requires the existence of at least one unique equation for the estimation of each path coefficient (Bollen, 1989) - i.e. the number of pieces of information shall be at least as large as the number of parameters to be estimated (also called the T-rule). This is usually done in two steps, and hence the name – two-step identification rule (Anderson and Gerbing, 1988). First, the measurement model (where the latent factors are allowed to load on indicator variables, and latent factors are allowed to correlate among one another) is identified, and then, identification of the structural model (where the latent factors are causally connected) is established. This two-step rule is sufficient (although not necessary) to establish model identification (Bollen, 1989).

To assess model identification for the measurement models (i.e. confirmatory factor models), we used the three-indicator rule as well as the two-indicator rule (both sufficient, but not necessary) in addition to satisfying the usual requirements such as all latent variables must have assigned a scale, and checking that the model is not empirically under-identified (Blunch, 2008; Tabachnick and Fidell, 2007). We also applied the commonly suggested way to fix the one indicator problem for some of the latent constructs that have only one indicator each. Then, we identified the structural models using the null B rule that states that a model in which no endogenous variable affects any other endogenous variable is always identified (Bollen, 1989).

5.4.3 Model Evaluation

In Structural Equation Modelling, the null hypothesis states that the model is true, and the alternate hypothesis states that it is not. So, we do not want to reject the null hypothesis here. Initial estimations of the proposed models showed that the data only partially supported these models (i.e. the null was rejected). Specifically, for the first model that examines the factors affecting a firm's utilization of Unsolicited Customer Input in NSD, the paths from "Industry clockspeed", "Customer focus", "Training for using UCI in NSD", and "Resources devoted to NSD" to "Utilization of UCI in NSD" proved to be non-significant. For the second model, the path from "Resources devoted to NSD" to "NSD Success" as well as to "NSD Speed proved to be non-significant; and the path from Tolerance of failure to "NSD Success" and to "Type of innovation pursued" also proved to be non-significant. The pattern of large normalized residuals, parameter significance tests, and AMOS modification indices (not exactly the same as the Lagrange multiplier tests, but serving identical purpose) also indicated a poor fit between the model and the data, and required the models to be modified. While models may be modified in a number of ways, they are most frequently modified either by eliminating a non-significant path from the model or by adding new paths to the model. Of the two, eliminating a non-significant path is less likely to capitalize on chance characteristics of the data, and is therefore less risky (Bentler and Chou, 1987; Hatcher, 1994). Therefore, a careful re-examination of the proposed models was done and alternate model specifications were estimated by removing one parameter at a time from the originally proposed models. For each modification estimated, a compelling theoretical argument was considered to avoid the dangers of data-driven model modifications such as introducing changes that capitalize on the chance characteristics of the sample data and create a new model that does not generalize to other samples.

The modification indices calculated by AMOS were used to prioritize among alternate model specifications. AMOS calculates these modification indices only for complete data. Therefore, we conducted the analysis in two stages. In the first stage, we estimated alternate model specifications by using the ML estimation method with complete data until a model specification achieved an acceptable fit. Since each alternate specification was nested under the original specification, we were able to use the chi-square difference test to determine whether removing a path significantly improved the model fit or not. Then, we validated that specification using the entire dataset by going back to the FIML estimation method. Fit measures are measures of the average fit of the model to the data. Even if this 'general' fit seems to be OK, the model could still have a bad fit in local places. So, we also checked standard errors of various parameters and coefficients of determination. We also paid particular attention to the residual covariance matrix in raw and standardized forms to ensure that none of the residuals are large, which would have required additional parameters to be estimated. Specifically, we checked that relatively few (or no) normalized residuals exceed 2.0

in absolute value. Final specifications of both the models along with respective fit measures are presented in section 5.5.

5.5 Results

The goal of a structural modelling analysis is to reach parsimonious models that give satisfactory description of the data with as few parameters as possible, while being theoretically sound and substantively meaningful. Broadly, the measures of model fit obtained for the measurement models and the theoretical models suggest a very good fit, and indicate that this goal was achieved.

The measurement models:

χ^2 statistic is non-significant for the first model as well as for the second part of the second model, and significant for the first part of the second model. While non-significant χ^2 indicates a good fit between the model specified and the data, the sole use of χ^2 statistic to assess model fit is considered problematic. The test may not discriminate between good fitting models and poor fitting models due to lack of power at small sample size (Kenny and McCoach, 2003), and may almost always reject the null at large sample size since a sharp null hypothesis is tested against a diffuse alternative (Bentler and Bonett, 1980; Jöreskog and Sörbom, 1993). Non-normality in the underlying distribution of the input variables can also result in the rejection of an otherwise properly specified model (Bollen and Long, 1993; McIntosh, 2007). Therefore, we also report other measures of model fit including absolute fit measures such as relative/normed chi-square (χ^2/df) (Wheaton et al., 1977), Goodness of Fit Index (GFI) Adjusted Goodness of Fit Index (AGFI) (Jöreskog and Sörbom, 1993), and Standardized Root Mean-square Residual (RMR); relative fit measures such as Normed Fit Index (NFI) (Bentler and Bonett, 1980), Tucker-Lewis Index (TLI) (Tucker and Lewis, 1973), Incremental Fit Index (IFI), and Comparative Fit Index (CFI) (Bentler, 1990); and fit measures based on the non-central χ^2 distribution such as Root Mean Square Error of Approximation (RMSEA) (Hu and Bentler, 1999). The fit indices are at or above their threshold values - χ^2/df is less than two (Tabachnick and Fidell, 2007); NFI, TLI, CFI, IFI, GFI are all greater than 0.9 (>0.95 in most cases) (Hu and Bentler, 1999); RMR is 0.05 or less (Byrne, 1998; Diamantopoulos et al., 2000); and RMSEA values are 0.04, 0.05, and 0.06, which are equal to or below the stringent cut-off value of 0.06 (Hu and Bentler, 1999). The measurement model loadings for both the models show that all of the factor loadings are statistically significant (see table 5.3), and are in the anticipated direction. As reported in table 5.3, the composite reliability for each construct exceeded the recommended threshold of 0.70, and the Average Variance Extracted values also exceeded the recommended threshold of 0.50, indicating acceptable scale reliability. A quick check on the standardized residuals confirmed that each indicator variable is indeed unifactorial given the absence of large positive and / or negative residual covariance values between manifest variables that load on different latent factors (Hatcher, 1994). Collectively, this suggests that the measurement models provide an acceptable fit to the data, display no non-significant factor loadings or large normalized residuals, and exhibit acceptable reliability and validity. Table 5.8 shows various fit measures for all three measurement models:

The theoretical models:

Fit indices, factor loadings, and path coefficients for the theoretical models are shown in figures 5.5, 5.6, and 5.7 respectively, and are all well above / below their relevant thresholds. Specifically, the chi-square/df ratio is less than 2; NFI, TLI, CFI, IFI, GFI are all greater than 0.9 (most of them are >0.95); Standardized RMR values are less than or equal to 0.5; RMSEA values are less than or equal to 0.06; the absolute value of the t-statistic for each factor loading and path coefficient exceeds 1.96; the standardized factor loadings are non-trivial in size (>0.05); the R² values for the latent endogenous variables are relatively large; normalized residuals are symmetrically distributed around and centred on zero, and do not exceed 2.0 in absolute value; and the chi-square difference test shows no significant difference between the theoretical models and the measurement models.

The chi-square difference test comparing the theoretical (i.e. full) model to the measurement model for each of the three models found no significant difference (see table 5.9) at p = 0.05 level. This also provides support for the nomological validity of the theoretical model (Anderson and Gerbing, 1988; Hatcher, 1994). As estimated, these models form the basis for testing the hypotheses. Next, we focus on examining the estimated coefficients, and discuss their practical and theoretical implications.

Our first set of hypotheses (H1-H7) focused on the factors that impact the utilization of Unsolicited Customer Input in NSD initiatives of a firm. The estimated model shows that four out of the seven hypothesized latent variable relationships are statistically significant (see table 5.10 for standardized estimates and critical ratios) and nontrivial in size. Specifically, it shows empirically that, “Incentives for using UCI in NSD”, “Customer focus”, “Negativity in UCI”, and “Resources devoted to NSD” have strong and statistically significant positive impact on “Utilization of UCI in NSD”. As expected, there are strong and statistically significant correlations between factors such as “Incentives for using UCI in NSD” and “Customer focus”; “Customer focus” and “Resources devoted to NSD”; “Incentives for using UCI in NSD” and “Resources devoted to NSD”; and “Negativity in UCI” and “Customer Focus”. Contrary to the initial expectation, the “Usefulness of UCI insights”, “Industry clockspeed”, and “Training for using UCI in NSD” do not seem to have a statistically significant impact on the “Utilization of UCI in NSD”.

Our next set of hypotheses (H8-H20) focused on the impact of Unsolicited Customer Input utilization in NSD on NSD outcomes such as “NSD Success”, “NSD Speed”, and “Type of innovation pursued”. As shown by the first part of the estimated model, “Utilization of UCI in NSD” has a strong and statistically significant positive impact on both “NSD Success” and “NSD Speed” (see table 5.10 for standardized estimates and critical ratios). “Tolerance of failure” has a direct positive impact only on “NSD Speed”. While the “Utilization of SCI in NSD” has a strong positive correlation with the “Utilization of UCI in NSD” as well as “Tolerance of failure”, it does not directly impact “NSD Success” or “NSD Speed”. As expected, the “Utilization of UCI in NSD” is strongly correlated to the “Utilization of SCI in NSD” as well as the “Tolerance of failure”. Interestingly, “NSD Speed” shows a strong and statistically significant positive impact on “NSD Success”, which also results in strong indirect positive effect of “Utilization of UCI in NSD”, and “Tolerance of failure” on “NSD Success”. As shown by the second part of the estimated model, only “Utilization of UCI in NSD” has a strong and statistically significant negative impact on the “Type of innovation pursued” (i.e. radicalness of the innovations pursued). While “Utilization of SCI in NSD” and “Resources devoted to NSD” have strong correlations with each other as well as with the “Utilization of UCI in NSD”, neither of them has a statistically significant direct impact on the “Type of innovation pursued by the firm”.

Given that all of the survey data were collected through a single survey instrument, common-method bias may potentially pose an issue in interpreting these results. For example, it can be argued that the firms that indicated a higher utilization of Unsolicited Customer Input in NSD may have also reported higher NSD success because of the focus of the survey on the role played by Unsolicited Customer Input in NSD. However, a multitude of factors lead us to believe that the results obtained are not affected by the common-method bias. First of all, the survey was completed by multiple respondents from each firm that took part in the survey. Input was solicited from three different parts of the firm – the customer care function, the NSD function, and the top management team. To allow each part of the firm to complete the relevant questions and then forward the survey to the next respondent within the firm, the survey was designed in a way that segmented the questions by the department that would be in the best position to answer those questions. So, the questions that focused on the use of Unsolicited Customer Input in NSD were answered by a different set of respondents than those who answered questions that asked about the performance of a firm's NSD portfolio, customer focus within the firm, industry clockspeed etc. Therefore, even though the responses were collected through a single survey instrument, the responses have not come from single key informants. Second, we tested a few hypotheses that could not have been refuted if the results were driven by a common-method bias. These were H1 (Usefulness of UCI insights driving Utilization of UCI in NSD, arguably a tautological relationship), H4 (Training for using UCI in NSD driving Utilization of UCI in NSD), H8-9 (Resources devoted to NSD driving NSD Speed and NSD Success), and H14-16 (Utilization of SCI in NSD driving NSD Success, NSD Speed, and Type of innovation pursued). However, the data does not support these hypotheses, diminishing the possibility of the presence of a common-method bias.

5.6 Discussion

Our analysis of the survey data collected from a sample of service firms shades a lot of light on the under-researched role of Unsolicited Customer Input in NSD by examining the factors that drive the use of Unsolicited Customer Input in NSD, and the impact of the utilization of this Unsolicited Customer Input in NSD on NSD outcomes such as speed, success, and type of innovation pursued by the firm.

As our data shows, pace of change within an industry (i.e. Industry clockspeed) does not seem to affect the utilization of Unsolicited Customer Input in NSD by a firm, even though one would expect that the firms that need to innovate more frequently would be more inclined to leverage various sources of ideas for innovation including the unsolicited customer feedback. As highlighted in previous research, many firms may be missing out on this opportunity to innovate using Unsolicited Customer Input partly because of a lack of understanding of the factors that impact a firm's ability to successfully leverage Unsolicited Customer Input in the NSD context (Johnston and Michel, 2008; Miller et al., 2000; Roth and Menor, 2003; Zhu et al., 2004). While the Unsolicited Customer Input can help the firms innovate (Fornell, 1976; Goodman, 1999; Voss et al., 2004), utilizing this input in the NSD activities can be resource-intensive. In fact, as shown by our first model, resourcing of the NSD function has the largest effect on the utilization of Unsolicited Customer Input in NSD.

The second most important factor that drives the utilization of Unsolicited Customer Input in NSD is the negativity in Unsolicited Customer Input. While negativity in Unsolicited Customer Input may make the firm's customer facing employees feel uneasy about recording or communicating the input within the firm (Tax and Brown, 1998), our model shows that once the input is made available to the NSD team, the negativity in Unsolicited Customer Input has a

strong positive effect on the utilization of Unsolicited Customer Input in NSD. Therefore, a firm should take steps to ensure that the negative Unsolicited Customer Input does not get filtered within the organization before it reaches the NSD group. If the organization is more customer-centric, there is a higher likelihood that the negative Unsolicited Customer Input will reach the NSD group. This is supported by the strong positive correlation observed between Customer focus and Negativity in Unsolicited Customer Input that reaches the NSD group.

Customer focus and resourcing of NSD group are also positively correlated with the availability of incentives that explicitly reward NSD employees for utilizing Unsolicited Customer Input in NSD. While the existence of processes that formally train the NSD group personnel in utilizing Unsolicited Customer Input in NSD does not seem to affect the actual utilization of Unsolicited Customer Input in NSD, the incentives that reward such use do have a strong positive effect on the utilization of Unsolicited Customer Input in NSD. Apart from its impact on the resourcing of the NSD function, extent to which negative customer feedback gets captured, and incentives for utilization of customer feedback in NSD, customer focus also has a direct positive effect on the utilization of Unsolicited Customer Input in NSD. Most notably, the results show that the perceived usefulness of Unsolicited Customer Input in NSD and innovation does not have a statistically significant relationship with the utilization of Unsolicited Customer Input in NSD. This strongly indicates that simply ensuring that the NSD personnel have access to potentially useful customer inputs may not help a firm's NSD efforts unless the firm is very customer-centric, has allocated sufficient resources to the NSD group, has provided incentives for the NSD team that encourage the use of customer insights in NSD, and has ensured that the negative customer feedback does not get filtered before reaching the NSD team.

Our next set of models shed light on the impact of utilizing Unsolicited Customer Input in NSD on NSD outcomes. Unlike in the past, the pace of change has become rapid in many industries in the last two decades. As Mark Zuckerberg (founder, Facebook) has said, many organizations have found that the key to survival is to move quickly and try a lot of new ideas rather than wait for a big idea that is guaranteed to work. As shown by the second model, utilization of Unsolicited Customer Input in NSD and a failure-tolerant internal environment have a significant positive impact on a firm's ability to innovate quickly. Contrary to the conventional wisdom, the resources devoted to NSD activities do not have a statistically significant impact on the firm's ability to innovate quickly. While positively correlated with the use of Unsolicited Customer Input in NSD and the tolerance of failure within the firm, the use of Solicited Customer Input in NSD also does not directly affect the firm's ability to innovate quickly. This partly suggests that even for the firms that already involve their customers in the NSD process through soliciting the customer feedback at different stages in the NSD process, there can still be a significant benefit in leveraging the Unsolicited Customer Input in the NSD process. The firm's ability to innovate quickly and the utilization of Unsolicited Customer Input in NSD have a significant positive impact on the marketplace success achieved by the firm's innovations. Between the two factors that do impact the success, speed has a stronger direct effect on success than does the utilization of Unsolicited Customer Input in NSD. However, since utilization of Unsolicited Customer Input in NSD also impacts the speed, the utilization of Unsolicited Customer Input in NSD has the biggest combined effect on the success of a firm's NSD efforts. Therefore, one can conclude that the use of Unsolicited Customer Input is not only useful, but also vital for a firm's ability to innovate quickly and successfully.

The third model addresses the question of what impact does the utilization of customer feedback have on the type of innovations (incremental / radical) pursued by the firm. Internal tolerance of failure does not at all seem to affect the type of innovation pursued by the firm. While the resources devoted to NSD have a positive correlation with the use of Unsolicited

Customer Input and the Solicited Customer Input in NSD, it does not seem to have a direct effect on the type of innovation pursued. The utilization of Solicited Customer Input also does not have a statistically significant impact on the type of innovation pursued. Only the use of Unsolicited Customer Input in NSD has a significant, negative impact on the type of innovation pursued. In other words, the use of Unsolicited Customer Input in NSD does seem to make a firm more likely to pursue incremental innovations rather than pursue radical innovations. This result provides some support for the view shared by many in the industry and academia that listening to customer feedback is useful for incremental innovations, but not for radical innovation. However, it is important not to club together the two types of customer input – solicited and unsolicited, since only the Unsolicited Customer Input seems to have this effect. Also important to note is the fact that the use of customer feedback in the NSD process only explains about a quarter of the variation in the type of innovation pursued by the firm. The use of Unsolicited Customer Input in NSD may indeed have an impact on the type of innovation pursued by the firm, but this impact seems to be relatively smaller and shadowed by the impact of other factors (not investigated here) on the type of innovation pursued by the firm. Therefore, before drawing any further conclusions, it may be useful to identify and examine other factors that may also have an impact on the type of innovation pursued by the firm.

Collectively, our results strongly support the notion that Unsolicited Customer Input can help the service firms innovate, and that the use of Unsolicited Customer Input positively impacts both NSD speed and NSD success. They indicate that simply being customer centric does not suffice, even though it helps, for a firm that wants to benefit from the Unsolicited Customer Input in its NSD efforts. In addition to ensuring the availability of Unsolicited Customer Input for the NSD team, a firm may need to commit adequate resources to the NSD group, maintain a customer-centric internal environment, offer specific incentives to the NSD group to encourage the use of Unsolicited Customer Input in NSD, and take steps to ensure that the negative customer feedback does not get censored within the firm before reaching the NSD group. NSD success is driven primarily by the understanding of customer needs, and firms that do leverage the Unsolicited Customer Input in NSD generally achieve greater speed and success even though the innovations produced may be closer to the firm's existing products and services than be radically different. While the use of Solicited Customer Input may also help the firm innovate, it is not a substitute for the use of Unsolicited Customer Input, which shows a much stronger effect on the speed and success of a firm's NSD initiatives. Lower tolerance of failure is also a necessity for the firms that want to compete in today's fast changing environment, since higher tolerance contributes positively to NSD speed, and NSD speed positively contributes to NSD success. While a firm needs to resource the NSD group adequately to ensure utilization of solicited as well as unsolicited customer feedback in NSD, the resourcing of the NSD function by itself does not contribute strongly to a higher likelihood of NSD speed or success. Finally, while there is some support for the notion that listening to customers too closely may drive a firm to innovate incrementally, factors other than the use of customer feedback in NSD seem to have a much greater impact on the type of innovation pursued by the firm.

Figure 5.1 Conceptual Model of Factors Affecting a Firm's Utilization of Unsolicited Customer Input in NSD

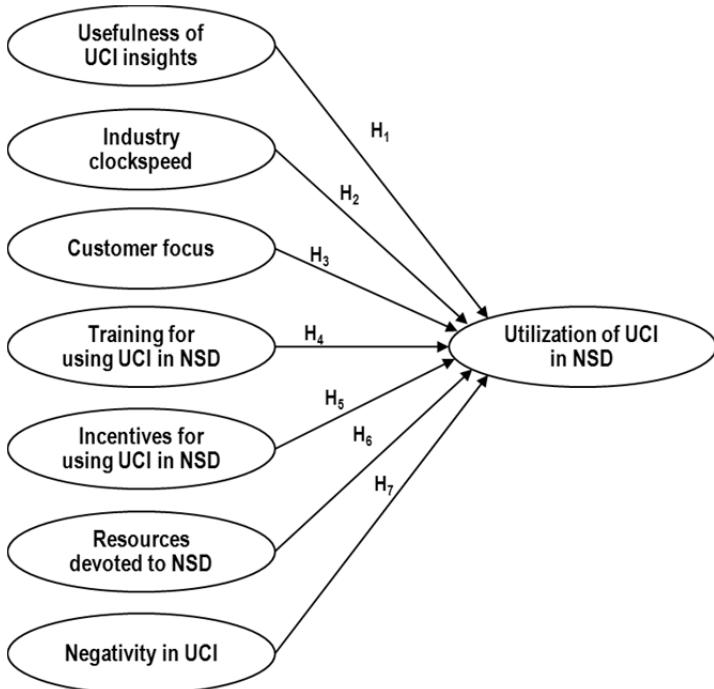


Figure 5.2 Conceptual Model of the Impact of Utilizing Unsolicited Customer Input on NSD outcomes

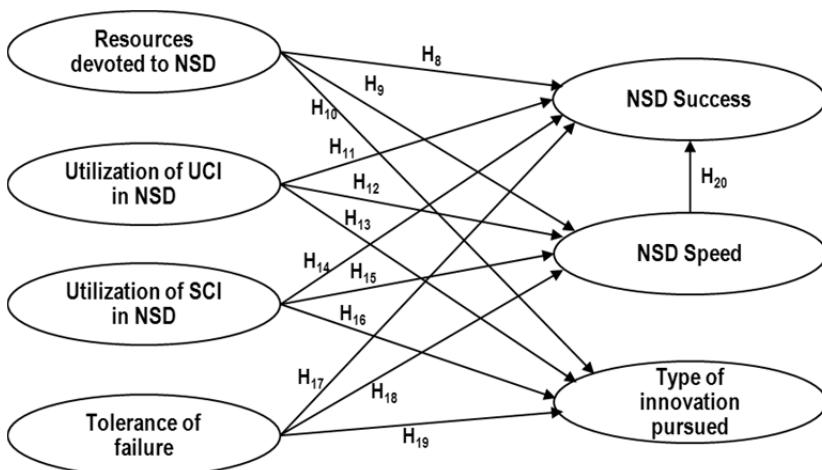


Figure 5.3 Research Model of Factors Affecting a Firm's Utilization of Unsolicited Customer Input in NSD

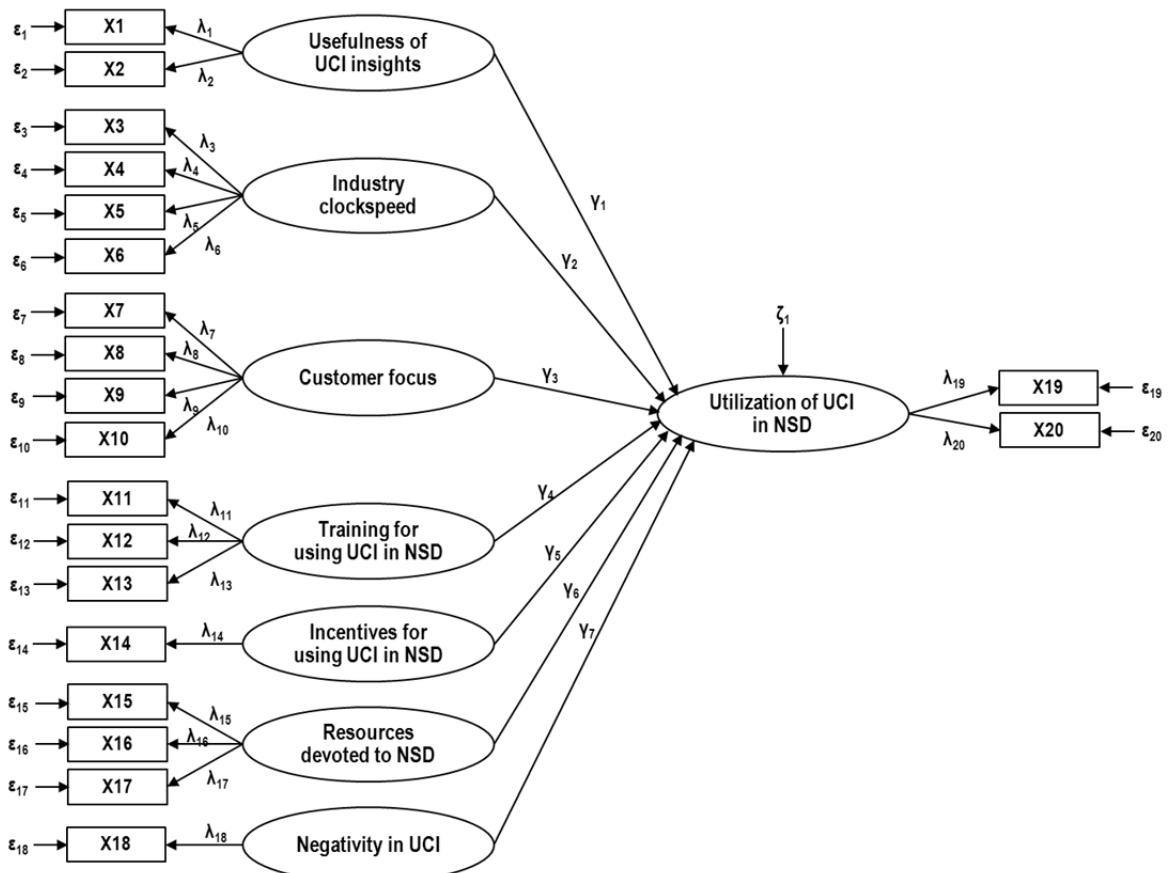


Figure 5.4 Research Model of Impact of Utilizing Unsolicited Customer Input on NSD Outcomes

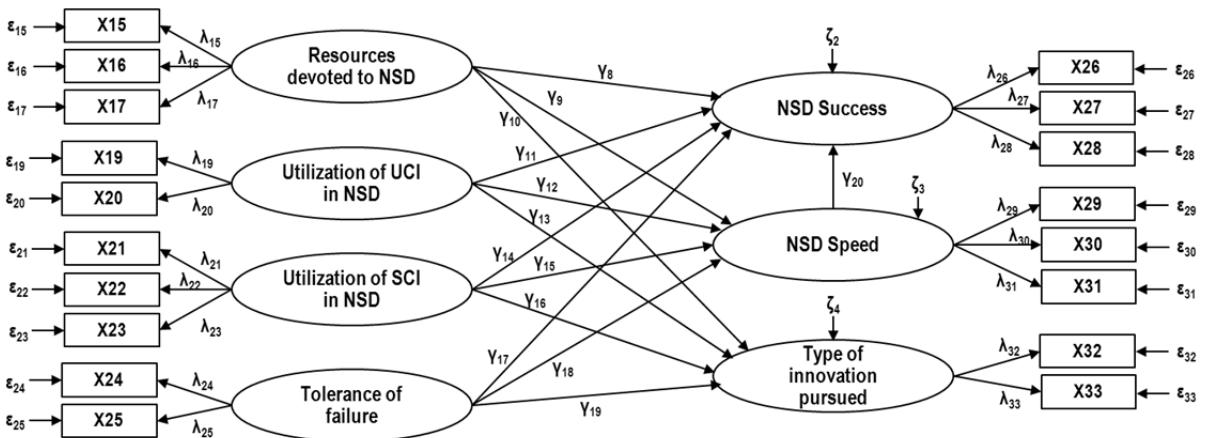
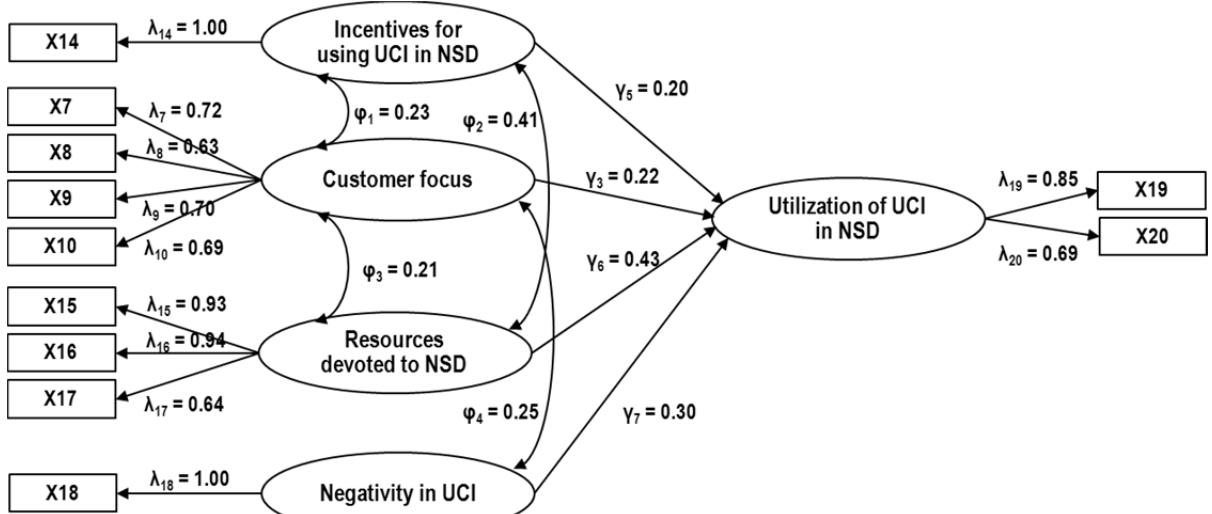
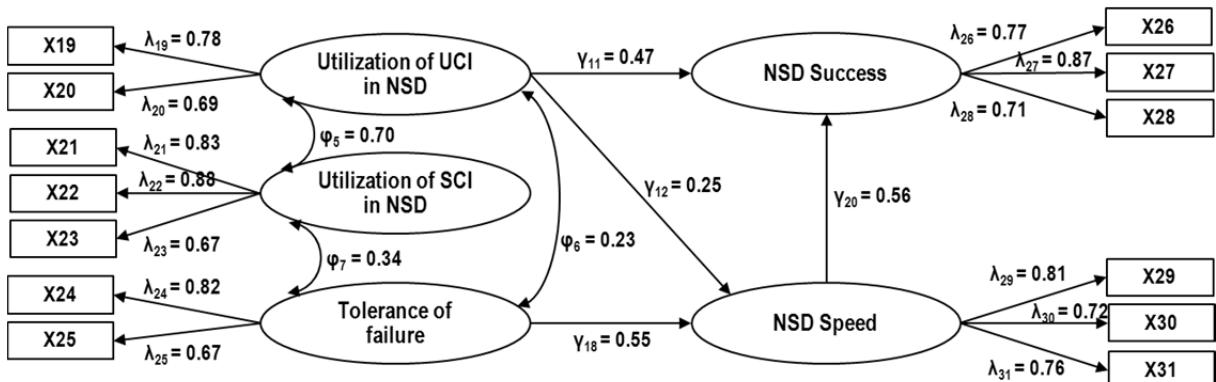


Figure 5.5 Estimated Model of Factors Affecting a Firm's Utilization of Unsolicited Customer Input in NSD



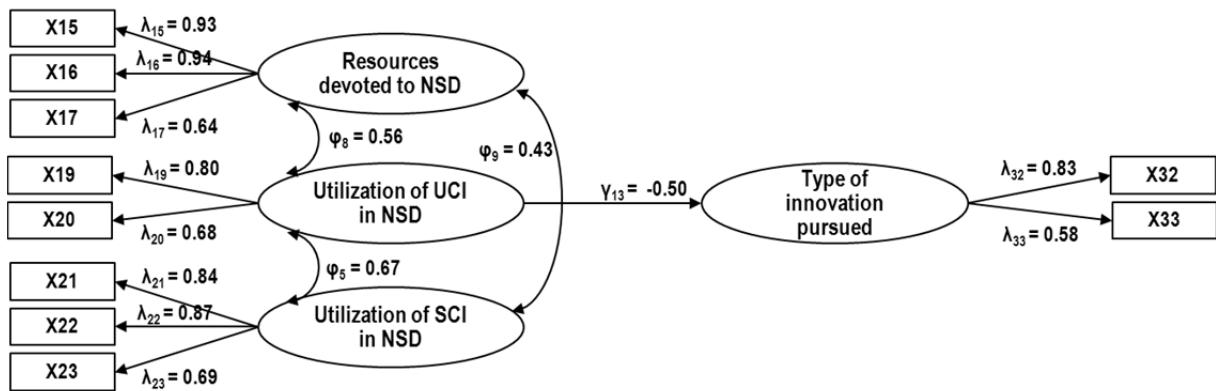
Notes: Overall fit: $\chi^2_{38,df} = 48.46$ ($p = 0.119$). $\chi^2_{,df} = 1.275$; NFI = 0.93; TLI = 0.98; CFI = 0.98; IFI = 0.98; GFI = 0.95; AGFI = 0.91; RMR = 0.05; 1-RMSEA = 0.96; $R^2_{\text{Utilization of UCI in NSD}} = 0.53$. Standardized estimates statistically significant at $p < 0.05$ level.

Figure 5.6 Estimated Model of Impact of Utilizing Unsolicited Customer Input on NSD Success and NSD Speed



Notes: Overall fit: $\chi^2_{58,df} = 97.14$ ($p = 0.001$). $\chi^2_{,df} = 1.675$; NFI = 0.91; TLI = 0.95; CFI = 0.96; IFI = 0.96; GFI = 0.92; AGFI = 0.88; RMR = 0.05; 1-RMSEA = 0.94; $R^2_{\text{NSD Success}} = 0.74$; $R^2_{\text{NSD Speed}} = 0.42$. Standardized estimates statistically significant at $p < 0.05$ level.

Figure 5.7 Estimated Model of Impact of Utilizing Unsolicited Customer Input on Type of Innovation Pursued



Notes: Overall fit: $\chi^2_{31\ df} = 41.91$ ($p = 0.091$). $\chi^2/\text{df} = 1.352$; NFI = 0.95; TLI = 0.98; CFI = 0.99; IFI = 0.99; GFI = 0.95; AGFI = 0.92; RMR = 0.04; 1-RMSEA = 0.95; $R^2_{\text{Type of innovation pursued}} = 0.25$. Standardized estimates statistically significant at $p < 0.01$ level.

Table 5.1 Scale Reliability based on Exploratory Factor Analysis

Construct^d	Items	Variance extracted	Communalities^c	Inter-item correlations^a	Cronbach's alpha^{a,b}
Usefulness of UCI insights	2	0.896	> 0.8	> 0.7	0.88 ^a
Industry clockspeed	4	0.634	> 0.5	> 0.4	0.81
Customer focus	4	0.624	> 0.5	> 0.5	0.80
Training for using UCI in NSD	3	0.83	> 0.7	> 0.6	0.90
Resources devoted to NSD	3	0.782	> 0.6	> 0.5	0.87
Utilization of UCI in NSD	2	0.770	> 0.7	> 0.5	0.70 ^a
Utilization of SCI in NSD	3	0.757	> 0.6	> 0.5	0.84
Tolerance of failure	2	0.769	> 0.7	> 0.5	0.70 ^a
NSD Success	3	0.750	> 0.6	> 0.5	0.83
NSD Speed	3	0.705	> 0.6	> 0.4	0.79
Type of innovation pursued	2	0.759	> 0.7	> 0.5	0.68 ^a

^a Cronbach's alpha is not an important criterion for scales with only two items as long as inter-item correlation is above 0.4 (Briggs and Cheek, 1986).

^b Cronbach's alpha value of 0.7 (Nunnally, 1978) / 0.8 (Nunnally, 1993) or greater indicate a reliable scale.

^c Communalities after extraction should be above 0.5 (Field, 2005)

^d Kaiser-Meyer-Olkin measure > 0.5 (Kaiser, 1974) and Barlett's test significant at p < 0.05 for all constructs

Table 5.2 Scale Reliability based on Confirmatory Factor Analysis

Construct	X2 (p-value)	AGFI^a	TLI^a	NFI^a	CFI^a	RMSEA (p-value)^a	AVE^b	CR^c
Usefulness of UCI insights	0.00 (p = 0.99)	1.00	1.00	1.00	1.00	0.00 (p = 0.99)	0.84	0.91
Industry clockspeed	2.31 (p = 0.12)	0.94	0.96	0.99	0.99	0.09 (p = 0.21)	0.47	0.77
Customer focus	0.55 (p = 0.76)	0.99	1.00	1.00	1.00	0.00 (p = 0.84)	0.47	0.78
Training for using UCI in NSD	0.01 (p = 0.94)	1.00	1.00	1.00	1.00	0.00 (p = 0.95)	0.75	0.90
Resources devoted to NSD	0.00 (p = 0.99)	1.00	1.00	1.00	1.00	0.00 (p = 0.99)	0.71	0.88
Utilization of UCI in NSD	0.00 (p = 0.93)	1.00	1.00	1.00	1.00	0.00 (p = 0.94)	0.59	0.74
Utilization of SCI in NSD	0.02 (p = 0.88)	0.99	1.00	1.00	1.00	0.00 (p = 0.90)	0.64	0.84
Tolerance of failure	0.05 (p = 0.82)	1.00	1.00	1.00	1.00	0.00 (p = 0.99)	0.53	0.69
NSD Success	0.00 (p = 0.99)	1.00	1.00	1.00	1.00	0.00 (p = 0.99)	0.64	0.84
NSD Speed	0.00 (p = 0.97)	1.00	1.00	1.00	1.00	0.00 (p = 0.98)	0.58	0.81
Type of innovation pursued	0.00 (p = 0.99)	1.00	1.00	1.00	1.00	0.00 (p = 0.99)	0.49	0.65

^a Adjusted Goodness-of-fit index (AGFI), Tucker-Lewis index (TLI), Normed fit index (NFI), comparative fit index (CFI) values equal to or exceeding 0.90, and Root Mean Square Error of Approximation (RMSEA) values equal to 0.05 or below indicate strong scale unidimensionality.

^b AVE (Average Variance Extracted) values equal to or exceeding .50 indicate that the measures are reflective of the construct.

^c CR (Composite Reliability) values equal to or exceeding .70 indicate strong scale reliability.

Table 5.3 Standardized Path Loadings from CFA and Descriptive Statistics

Construct and measurement items	Std. path loadings	Critical Ratio	Mean^a	SD
Usefulness of UCI insights				
The feedback provided by the customers is generally useful for improving the products / services concerned	0.91	-	5.30	1.40
The feedback provided by the customer is generally useful for designing new products / services	0.93	20.84	5.00	1.50
Industry clockspeed				
In our industry, customers look for new products / services all the time	0.59	6.67	4.69	1.68
In our industry, taste and preferences of customers change very quickly	0.50	5.75	3.54	1.66
In our industry, the rate of innovation in products and services is rapid	0.91	-	4.08	1.86
In our industry, the rate of innovation in operations processes is rapid	0.69	7.42	3.60	1.65
Customer focus				
We strive to be highly responsive to our customers' needs	0.76	8.08	5.74	1.34
Our organization is more customer focused than are our competitors	0.66	7.44	4.96	1.43
We rapidly attend to complaints from our customers	0.74	-	5.52	1.37
We view customers as potential and valuable sources of new offering ideas and opportunities	0.60	6.84	5.30	1.50
Training for using UCI in NSD				
Our NPD / NSD personnel are trained to utilize customer feedback in NSD	0.76	-	4.00	1.92
This training process is very structured and formal	0.88	14.95	3.32	1.9
Most of our NPD / NSD personnel have already received this training	0.96	16.92	3.54	1.94
Resources devoted to NSD				
Our firm has a dedicated NPD / NSD department	0.92	-	4.26	2.47
The NPD / NSD group has been in existence in our firm for a long time	0.95	16.72	4.28	2.36
Our firm spends the highest percentage of its revenue on NPD / NSD across firms in the industry	0.64	9.17	3.27	1.92
Utilization of UCI in NSD				
Our NPD / NSD group members always take customer feedback into account while working on NPD / NSD	0.79	-	4.36	1.91

Utilization of insights obtained from customer feedback is a formal step in our NPD / NSD process	0.74	10.34	4.48	1.8
Utilization of SCI in NSD				
Our firm always solicits customer involvement in the NPD / NSD process	0.82	-	4.52	1.79
Our firm always involves customers in all stages of the NPD / NSD process	0.90	14.95	3.85	1.77
When our firm decides to act on an issue identified through customer feedback, the firm always solicits input from a broader range of customers	0.67	16.92	4.18	1.75
Tolerance of failure				
Taking risks is an element of our innovation strategy	0.72	-	4.56	1.67
Our firm is tolerant of new product / service failures	0.74	10.88	4.23	1.71
NSD Success				
Over the last few years, our firm has frequently come up with entirely new products / services by leveraging customer input	0.67	9.22	4.10	1.70
The degree to which our firm's NPD / NSD program has been successful in meeting customer requirements for new offerings is very high	0.89	-	4.37	1.50
The percentage of our firm's NPD / NSD projects launched within the past 3 years that achieved marketplace success is very high	0.82	11.67	4.35	1.56
NSD Speed				
Our firm is generally first in the market in introducing new products / services	0.69	-	4.11	1.66
Our time-to-market for developing new products / services is much lower than that of our nearest competition	0.76	10.93	3.95	1.67
Our firm is more capable than is our competition when it comes to making quick changes to existing products or services	0.85	12.05	4.26	1.66
Type of innovation pursued				
New products / services are designed to complement the firm's current offerings	0.64	-	2.24	1.06
New products / services introduced typically fit with the firm's existing contact personnel skills and resources	0.76	10.88	2.50	1.25

^a Likert-scale responses from 1 (strongly disagree) to 7 (strongly agree).

Table 5.4 Discriminant Validity Analysis: Constrained vs. Unconstrained CFA Models

Test with	Correlation Estimate	Critical Ratio	χ^2 (Constrained Model) ^e	χ^2 (Unconstrained Model) ^e	χ^2 Difference
Usefulness of UCI insights					
Industry clockspeed	0.19	2.12	22.93 (10)	11.33 (9)	11.60 ^a
Customer focus	0.39	4.11	46.14 (11)	27.38 (10)	18.76 ^a
Training for using UCI in NSD	0.27	3.29	37.38 (8)	15.58 (7)	21.80 ^a
Resources devoted to NSD	0.19	2.38	15.88 (8)	10.02 (7)	5.86 ^c
Tolerance of failure	0.14	1.46	56.93 (6)	4.48 (5)	52.45 ^a
NSD Success	0.44	5.17	17.33 (7)	13.33 (6)	4.00 ^c
NSD Speed	0.26	3.03	66.19 (8)	12.75 (7)	53.44 ^a
Type of innovation pursued	-0.3	-3.12	162.9 (6)	10.17 (5)	152.73 ^a
Industry clockspeed					
Customer focus	0.41	3.86	34.66 (19)	32.44 (18)	2.22 ^d
Training for using UCI in NSD	0.29	3.53	13.13 (14)	11.54 (13)	1.59 ^d
Resources devoted to NSD	0.27	3.19	18.09 (14)	18.08 (13)	0.01 ^d
Tolerance of failure	0.20	2.05	12.85 (10)	3.44 (9)	9.41 ^b
NSD Speed	0.29	3.27	20.04 (14)	14.25 (13)	5.79 ^c
Type of innovation pursued	-0.27	-2.09	89.12 (10)	9.27 (9)	79.85 ^a
Customer focus					
Training for using UCI in NSD	0.39	4.12	18.42 (15)	9.66 (14)	8.76 ^b
Resources devoted to NSD	0.18	1.92	22.92 (15)	15.13 (14)	7.79 ^b
Tolerance of failure	0.37	3.49	36.87 (11)	21.17 (10)	15.70 ^a
NSD Success	0.47	4.22	26.51 (14)	22.06 (13)	4.45 ^c
NSD Speed	0.43	4.26	39.22 (15)	22.7 (14)	16.52 ^a
Type of innovation pursued	-0.29	-2.58	117.62 (11)	8.24 (10)	109.38 ^a
Training for using UCI in NSD					
Resources devoted to NSD	0.58	10.25	31.92 (11)	18.59 (10)	13.33 ^a
Utilization of UCI in NSD	0.71	11.83	60.63 (8)	50.04 (7)	10.59 ^b
Tolerance of failure	0.11	1.18	40.42 (8)	5.49 (7)	34.93 ^a
NSD Speed	0.24	2.74	40.38 (11)	11.55 (10)	28.83 ^a
Type of innovation pursued	-0.25	-2.51	111.7 (8)	11.51 (7)	100.19 ^a
Resources devoted to NSD					
Utilization of UCI in NSD	0.57	8.16	19.4 (8)	9.29 (7)	10.11 ^b
Utilization of SCI in NSD	0.35	4.55	8.96 (11)	8.8 (10)	0.16 ^d
Tolerance of failure	0.08	0.8	31.17 (8)	18.34 (7)	12.83 ^a
NSD Speed	0.03	0.37	53.25 (11)	33.18 (10)	20.07 ^a
Type of innovation	-0.21	-2.08	87.89 (8)	7.89 (7)	80.00 ^a

pursued

Utilization of UCI in NSD

Utilization of SCI in NSD	0.7	11.01	18.4 (8)	8.87 (7)	9.53 ^b
Tolerance of failure	0.19	1.76	25.89 (7)	9.41 (6)	16.48 ^a
NSD Speed	0.33	3.56	13.98 (8)	4.08 (7)	9.90 ^b
Type of innovation pursued	-0.57	-5.09	137.4 (7)	29.92 (6)	107.48 ^a

Utilization of SCI in NSD

Tolerance of failure	0.28	2.91	26.91 (8)	13.05 (7)	13.86 ^a
NSD Speed	0.36	4.42	26.63 (11)	15.62 (10)	11.01 ^a
Type of innovation pursued	-0.29	-2.85	136.9 (8)	14.03 (7)	122.87 ^a

Tolerance of failure

NSD Success	0.39	3.97	20.49 (7)	13.78 (6)	6.71 ^b
NSD Speed	0.56	7.18	11.46 (8)	4.79 (7)	6.67 ^b
Type of innovation pursued	0.02	0.18	122.5 (7)	27.5 (6)	95.00 ^a

NSD Success

NSD Speed	0.71	8.43	35.59 (10)	35.31 (9)	0.28 ^d
Type of innovation pursued	-0.23	-2.57	161.95 (7)	17.09 (6)	144.86 ^a

NSD Speed

Type of innovation pursued	-0.05	-0.5	174.1 (8)	2.87 (7)	171.23 ^a
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^a χ^2 difference significant at $p < 0.001$, ^b χ^2 difference significant at $p < 0.01$, ^c χ^2 difference significant at $p < 0.05$, ^d χ^2 difference non-significant.

^e The values in the parenthesis denote degrees of freedom

Table 5.5 Comparison of Scale AVE with Squared Inter-factor Correlation

Square of factor correlation	Usefulness of UCI insights	Industry clockspeed	Customer focus	Training for using UCI in NSD	Resources devoted to NSD	Utilization of UCI in NSD	Utilization of SCI in NSD	Tolerance of failure	NSD Success	NSD Speed	Type of innovation pursued
Usefulness of UCI insights	0.04	0.15	0.07	0.04	0.29	0.25	0.02	0.19	0.07	0.09	
Industry clockspeed	0.04		0.17	0.08	0.07	0.09	0.07	0.04	0.12	0.08	0.07
Customer focus	0.15	0.17		0.15	0.03	0.21	0.41	0.14	0.22	0.18	0.08
Training for using UCI in NSD	0.07	0.08	0.15		0.34	0.50	0.24	0.01	0.24	0.06	0.06
Resources devoted to	0.04	0.07	0.03	0.34		0.32	0.12	0.01	0.12	0.00	0.04

NSD												
Utilization of UCI in NSD	0.29	0.09	0.21	0.50	0.32		0.49	0.04	0.44	0.11	0.32	
Utilization of SCI in NSD	0.25	0.07	0.41	0.24	0.12	0.49		0.08	0.27	0.13	0.08	
Tolerance of failure	0.02	0.04	0.14	0.01	0.01	0.04	0.08		0.15	0.31	0.00	
NSD Success	0.19	0.12	0.22	0.24	0.12	0.44	0.27	0.15		0.50	0.07	
NSD Speed	0.07	0.08	0.18	0.06	0.00	0.11	0.13	0.31	0.50		0.00	
Type of innovation pursued	0.09	0.07	0.08	0.06	0.04	0.32	0.08	0.00	0.07	0.00		
Maximum factor covariance		0.29	0.17	0.41	0.50	0.34	0.50	0.49	0.31	0.50	0.50	0.32
AVE for the factor	0.84	0.47	0.47	0.75	0.71	0.59	0.64	0.53	0.64	0.58	0.49	

Table 5.6 Convergent, Divergent, and Construct Validity Analysis

Factor correlations	Usefulness of UCI insights	Industry clockspeed	Customer focus	Training for using UCI in NSD	Resources devoted to NSD	Utilization of UCI in NSD	Utilization of SCI in NSD	Tolerance of failure	NSD Success	NSD Speed	Type of innovation pursued
Usefulness of UCI insights		0.19	0.39	0.27	0.19	0.54	0.50	0.14	0.44	0.26	- 0.30
Industry clockspeed	0.19		0.41	0.29	0.27	0.30	0.27	0.20	0.34	0.29	- 0.27
Customer focus	0.39	0.41		0.39	0.18	0.46	0.64	0.37	0.47	0.43	- 0.29
Training for using UCI in NSD	0.27	0.29	0.39		0.58	0.71	0.49	0.11	0.49	0.24	- 0.25
Resources devoted to NSD	0.19	0.27	0.18	0.58		0.57	0.35	0.08	0.35	0.03	- 0.21
Utilization of UCI in NSD	0.54	0.30	0.46	0.71	0.57		0.70	0.19	0.66	0.33	- 0.57
Utilization of SCI in NSD	0.50	0.27	0.64	0.49	0.35	0.70		0.28	0.52	0.36	- 0.29
Tolerance of failure	0.14	0.20	0.37	0.11	0.08	0.19	0.28		0.39	0.56	0.02
NSD Success	0.44	0.34	0.47	0.49	0.35	0.66	0.52	0.39		0.71	- 0.26
NSD Speed	0.26	0.29	0.43	0.24	0.03	0.33	0.36	0.56	0.71		- 0.05
Type of innovation pursued	- 0.30	- 0.27	- 0.29	- 0.25	- 0.21	-	0.57	- 0.29	0.02	- 0.26	- 0.05

Table 5.7 Univariate Normality Check for Measurement Items

Construct and measurement items	Skewness	Kurtosis
Usefulness of UCI insights		
The feedback provided by the customers is generally useful for improving the products / services concerned	-1.14	1.61
The feedback provided by the customer is generally useful for designing new products / services	-0.87	0.42
Industry clockspeed		

In our industry, customers look for new products / services all the time	-0.44	-0.84
In our industry, taste and preferences of customers change very quickly	0.43	-0.90
In our industry, the rate of innovation in products and services is rapid	0.05	-1.28
In our industry, the rate of innovation in operations processes is rapid	0.24	-0.90
Customer focus		
We strive to be highly responsive to our customers' needs	-1.37	1.75
Our organization is more customer focused than are our competitors	-0.48	-0.33
We rapidly attend to complaints from our customers	-1.09	0.84
We view customers as potential and valuable sources of new offering ideas and opportunities	-0.93	0.30
Training for using UCI in NSD		
Our NPD / NSD personnel are trained to utilize customer feedback in NSD	-0.07	-1.09
This training process is very structured and formal	0.47	-0.87
Most of our NPD / NSD personnel have already received this training	0.27	-1.03
Resources devoted to NSD		
Our firm has a dedicated NPD / NSD department	-0.26	-1.66
The NPD / NSD group has been in existence in our firm for a long time	-0.23	-1.55
Our firm spends the highest percentage of its revenue on NPD / NSD across firms in the industry	0.38	-0.95
Utilization of UCI in NSD		
Our NPD / NSD group members always take customer feedback into account while working on NPD / NSD	-0.31	-1.05
Utilization of insights obtained from customer feedback is a formal step in our NPD / NSD process	-0.35	-0.92
Utilization of SCI in NSD		
Our firm always solicits customer involvement in the NPD / NSD process	-0.41	-0.91
Our firm always involves customers in all stages of the NPD / NSD process	0.07	-1.10
When our firm decides to act on an issue identified through customer feedback, the firm always solicits input from a broader range of customers	-0.37	-1.02
Tolerance of failure		
Taking risks is an element of our innovation strategy	-0.46	-0.65
Our firm is tolerant of new product / service failures	-0.25	-0.93
NSD Success		
Over the last few years, our firm has frequently come up with entirely new products / services by leveraging customer input	-0.15	-0.92
The degree to which our firm's NPD / NSD program has been successful in meeting customer requirements for new offerings is very high	-0.54	-0.41
The percentage of our firm's NPD / NSD projects launched within the past 3 years that achieved marketplace success is very high	-0.29	-0.58
NSD Speed		
Our firm is generally first in the market in introducing new products / services	-0.29	-0.73
Our time-to-market for developing new products / services is much lower than that of our nearest competition	-0.15	-0.73
Our firm is more capable than is our competition when it comes to making quick changes to existing products or services	-0.28	-0.61
Type of innovation pursued		
New products / services are designed to complement the firm's current offerings	1.09	1.72
New products / services introduced typically fit with the firm's existing contact personnel skills and resources	1.31	1.91

Table 5.8 Fit Measures for the Measurement Models

Model	χ^2	df	χ^2/df	NFI	TLI	CFI	IFI	GFI	AGFI	RMR	1-RMSEA
Factors affecting Utilization of UCI in NSD	46.24	36	1.28	0.93	0.98	0.98	0.98	0.95	0.91	0.05	0.96
Impact of Utilization of UCI on NSD Success and NSD Speed	96.04	55	1.75	0.91	0.94	0.96	0.96	0.92	0.87	0.05	0.93
Impact of Utilization of UCI on Type of innovation pursued	40.74	29	1.40	0.95	0.98	0.99	0.99	0.96	0.91	0.04	0.95

Table 5.9 χ^2 -difference Test between Measurement Model and Theoretical Model

Model	Measurement Model		Theoretical Model		Difference ^a	
	χ^2	df	χ^2	df	χ^2	df
Factors affecting Utilization of UCI in NSD	46.24	36	48.46	38	2.22	2
Impact of Utilization of UCI on NSD Success and NSD Speed	96.04	55	97.14	58	1.10	3
Impact of Utilization of UCI on Type of innovation pursued	40.74	29	41.91	31	1.17	2

^a χ^2 difference < 5.99 for df = 2, and < 7.82 for df = 3 are statistically insignificant at p = 0.05

Table 5.10 Standardized Estimates and Critical Ratios

Latent variable relationship	Standardized loading	Critical ratio
Causal relationships		
γ_3 - Customer focus to Utilization of UCI in NSD	0.22	2.40
γ_5 - Incentives for using UCI in NSD to Utilization of UCI in NSD	0.20	2.47
γ_6 - Resources devoted to NSD to Utilization of UCI in NSD	0.43	4.46
γ_7 - Negativity in UCI to Utilization of UCI in NSD	0.30	3.89
γ_{11} - Utilization of UCI in NSD to NSD Success	0.47	5.57
γ_{12} - Utilization of UCI in NSD to NSD Speed	0.25	2.72
γ_{18} - Tolerance of failure to NSD Speed	0.55	4.76
γ_{20} - NSD Speed to NSD Success	0.56	6.76
γ_{13} - Utilization of UCI in NSD to Type of Innovation pursued	-0.50	-4.83
Correlations		
ϕ_1 - Incentives for using UCI in NSD and Customer focus	0.23	2.37
ϕ_2 - Incentives for using UCI in NSD and Resources devoted to NSD	0.41	4.05
ϕ_3 - Customer focus and Resources devoted to NSD	0.21	2.11
ϕ_4 - Customer focus and Negativity in UCI	0.25	2.57

ϕ_5 - Utilization of UCI in NSD and Utilization of SCI in NSD	0.70	5.8
ϕ_6 - Utilization of UCI in NSD and Tolerance of failure	0.23	2.16
ϕ_7 - Utilization of SCI in NSD and Tolerance of failure	0.34	3.41
ϕ_8 - Utilization of UCI in NSD and Resources devoted to NSD	0.56	5.32
ϕ_9 - Utilization of SCI in NSD and Resources devoted to NSD	0.43	4.64

Note: For one-tailed tests of significance, critical ratio (CR) = |1.65|, p<0.05; CR = |2.33|, p<0.01; CR = |3.10|, p<0.001

Chapter 6. Conclusion

Building on the NSD, Service Quality, and Service Recovery literatures, this doctoral research focused on the exploration of the role played by Unsolicited Customer Input in NSD, and the impact of such use on NSD outcomes. Specifically, three research questions were addressed: (1) How do firms leverage Unsolicited Customer Input as a source of ideas for Service Innovation? (2) What are the factors that impact a firm's ability to do so? (3) What impact does the use of Unsolicited Customer Input in NSD have on the NSD outcomes such as NSD Speed, NSD Success, and Type of innovation pursued? Two studies - a case study and a survey were conducted to empirically refine, extend, and test the conceptual framework and related hypotheses. Chapter 3 presented the results obtained from the case study of eight service firms consisting of an in-depth examination of firm processes that connect the Unsolicited Customer Input with the NSD activities within the firm. Chapters 4 and 5 presented the results obtained from a wide-scale survey of service firms that was conducted to empirically test the process and outcome related propositions initially put forward in chapter 3. This final chapter draws on the findings of these three chapters to present the overall conclusions, limitations, and opportunities for future research.

6.1 Conclusions

Contrary to the “closed innovation” model of the 20th century that was characterized by a fully integrated pipeline of innovations - from idea generation to development and launch of products and services, the “open innovation” paradigm described by Chesbrough (2003) suggests that firms should constantly reach outside their own boundaries to find valuable ideas for innovation. Firms that engage in such external search for innovation are shown to enjoy a number of innovation benefits (Eisenhardt and Santos, 2002; Laursen and Salter, 2006). Successful organizations in a dynamic environment need to be ambidextrous (Birkinshaw and Gibson, 2004; Gibson and Birkinshaw, 2004), and achieve a balance between exploration and exploitation. While being aligned and efficient in the management of today’s business demands (i.e. exploitation) ensures success in the present, continuous adaptation to changes in the environment (i.e. exploration) is necessary to ensure continued survival in the future (Duncan, 1976; Gibson and Birkinshaw, 2004; Tushman and O'Reilly, 1996). Exploration allows a firm to increase the scope of the search for new ideas. This enriches the knowledge pool by adding distinctive new variations (March, 1991), and enhances the combinatory search capabilities of the firm (Katila and Ahuja, 2002), which leads to new combinations of previously disconnected ideas. As one of the primary external sources of innovation, unsolicited customer insights can help the firms strike a balance between exploitation and exploration, and benefit from the externally generated insights to stay ahead of the competition.

Successful service innovation is characterized by a service offering that provides a unique value proposition to a sufficiently large segment of customers, a willingness of the customers to make changes in their behaviour / lifestyle to adopt the service, the firm’s ability to reliably deliver the service, and finally, the other organizations’ inability to readily duplicate the idea and offer the same value to the same set of customers as effectively as does the firm. Insights that come from the customers readily address the first two of these considerations and therefore, can be very valuable for the NSD efforts of any service firm. Our results strongly support the notion that Unsolicited Customer Input can help the service firms innovate, and that the use of Unsolicited Customer Input positively impacts both NSD speed (which also helps achieve greater NSD success) and NSD success. As suggested by Alam (2002), we also

find that involving users in NSD can speed up a service's acceptance in the market since the service is developed specifically to address the input provided by the customers themselves. Also, by acting on the input provided by the customers, a firm can positively influence the loyalty of these customers as the customers feel valued given the attention paid by the firm to their suggestions. Listening to the Unsolicited Customer Input may help the firm generate a variety of powerful new service ideas in a short amount of time, saving the firm a lot of time, effort, and resources spent by other firms in conducting market research and in soliciting customer input. In addition, service testing and pilot runs may be conducted more effectively for the services that are developed based on the Unsolicited Customer Input by leveraging those customers who provided that unsolicited input in the first place.

Our results indicate that the firms that are able to benefit from the use of Unsolicited Customer Input in NSD employ a carefully thought and well executed process to connect the Unsolicited Customer Input with the NSD activities within the firm. Although the need to innovate as governed by the industry clockspeed is a necessary condition that drives the firm to look for ways to innovate, it is the extent to which the firm is customer-focused that drives the firm to put in place a specific process that enables the organization to utilize Unsolicited Customer Input in NSD. Such process entails steps taken by the firm to encourage the customers to provide feedback to the firm, capture of direct and indirect customer feedback, analysis of the feedback received across various channels, and utilization of the insights obtained by analysing customer feedback in NSD. Even though the use of Unsolicited Customer Input in NSD can increase the chances of a firm pursuing more incremental than radical innovation, such use allows the firm to innovate at a faster pace and experience a greater level of NSD success. Figure 6.1 graphically captures this process.

Our results also highlight the importance of a number of internal firm factors that are critical for ensuring that the firm actually gets to benefit from the Unsolicited Customer Input. The results indicate that simply being customer centric does not suffice, even though it helps, for a firm that wants its NSD efforts to benefit from the Unsolicited Customer Input. Incentives for the customers that provide valuable feedback to the firm, a service design that provides opportunities to the customer to provide input to the firm at various stages of the service life cycle, and a customer-centric service climate within the firm can ensure that the customers provide frequent and meaningful input to the firm. While a customer-centric service climate ensures that the firm employees remain receptive to the unsolicited customer feedback, it does not ensure that such feedback is fully captured by those who receive the input. Carefully designed incentives that reward the employees for capturing the input, availability of organizational slack that allow the customer facing employees to take the time necessary to record the input, and a firm-wide tolerance of negative feedback can ensure that the feedback received by the firm is captured and communicated to the rest of the firm to allow the firm to benefit from this feedback. In addition to capturing the feedback received directly from the customers, a firm may need to ensure that the customer feedback expressed elsewhere (on the internet / discussion forums / social media etc.) is also captured to allow the firm an opportunity to develop a holistic view of the customers' needs and the extent to which the firm's current services are able to satisfy those needs. Since the internet and social media are evolving rapidly, a firm may need to provide specific training and create customized incentives for the firm employees to ensure that they effectively capture the relevant customer feedback expressed through these channels.

Once the feedback is captured and available within the firm, the firm needs to ensure that this feedback is analysed and the insights obtained are put to use by those who are involved in the firm's NSD efforts. Our results indicate that a flexible process for analysis and a firm-wide

dissemination of insights obtained from such analysis are most helpful in ensuring that the firm actually obtains innovation-driving insights from the customer feedback. These insights can allow the NSD personnel to benefit from the customer feedback without burdening them with the huge volumes of seemingly disconnected records of individual customer interactions with the firm. In addition to ensuring the availability of Unsolicited Customer Input for the NSD team, a firm needs to commit adequate resources for the NSD activities, offer specific incentives to the NSD personnel to encourage the use of Unsolicited Customer Input in NSD, and take steps to ensure that the negative customer feedback does not get censored within the firm before reaching the NSD group. Figure 6.2 captures these results in a process diagram that shows the individual process stages and the factors that affect the success of each stage. Although subject to further refinement and testing, these results also have implications for service managers and firms that are looking for ways to develop new services and improve the existing services. By providing a more cogent understanding of the relatively unexplored process of utilizing Unsolicited Customer Input in NSD, this research makes an important contribution to the service operations, new product / service development, and innovation literature.

6.2 Limitations and Opportunities for Future Research

The essay in chapter 3 presented a conceptual framework describing the process organizations can use to connect Unsolicited Customer Feedback with NSD, and then refined and extended this framework through a case study consisting of eight service firms. The essays in chapter 4 and 5 tested the conceptual framework presented in chapter 3, using the data collected through a wide-scale survey of 402 service firms. The propositions referred to the process stages and the factors that impact each of the stages that the firms follow to obtain innovation-driving insights from the Unsolicited Customer Input, and the impact of such use on NSD outcomes. While these studies make notable contributions to our understanding of the role played by the Unsolicited Customer Input in a firm's NSD activities including the process that firms need to follow, the factors that can affect the process, and the impact of such use on NSD outcomes; several limitations arising from the nature of the studies conducted deserve attention. These limitations also point to the opportunities for further research in this area.

6.2.1 The case study-based essay

As is the case with most qualitative research, the case research presented in chapter 3 is exploratory in nature, and the results do not lend themselves to any statistical inferences around the importance of the various process steps that the case study firms seemed to follow in leveraging the Unsolicited Customer Input in NSD, and the effect of such use on NSD outcomes. Rather, it conceptualizes and empirically investigates a process framework that is grounded in research literature. The research and its findings presented in this chapter are subject to several limitations arising from the research methodology chosen and the sampling strategy implemented.

First of all, given the goal of theory-building, this study has used in-depth field interviews in a small number of service firms. Therefore, its findings should be considered tentative. Based on our choice of key-informant interviewing as the method of data collection, we expect that our results appropriately reflect the process steps and the factors that affect these steps as described by the case study firms. However, it is entirely possible that there are other process steps or factors that affect the process, which are considered unimportant by the case study

firms although in use at other firms not approached for this study. The same way, it is also possible that the process steps and the factors that affect the process as highlighted by the case study firms may be viewed as less important by the other firms. However, the fact that the case firms may have failed to comment on specific process steps or factors that affect the process does not serve as counterevidence to the propositions put forth by this study (Zomerdijk and Voss, 2010).

Second, although we did consciously select firms operating in the southeast of England to limit regional variation in firm practices, it raises questions around the generalizability of our findings beyond the firms operating in this region. Also, given the qualitative research methodology employed, a direct performance implication of customer involvement in NSD through the use of Unsolicited Customer Input could also not be determined because such measurement was not possible. To address these limitations and to put the validity of our propositions to the rigour of statistical testing, we conducted a wide-scale survey of service firms located across the globe. The findings of this survey are presented in chapters 4 and 5, and are broadly supportive of the conceptual framework presented in this chapter.

Third, we cannot rule out the possibility of any contingency effects that may be present in the findings of this study. Researchers and practitioners have argued that sometimes one size does not fit all, and that practices may need to be adapted, extended, or modified depending on the context (Zomerdijk and Voss, 2010). Future studies can explore the possible contingency factors such as nature of the service (self-service/employee-delivered service), reliance on technology (high-tech / low-tech), and the standard of customer service that is considered acceptable in the region where a firm operates.

Fourth, given the constraints of time and budget, a cross-sectional approach to data collection was adopted for this research. Although this approach has been frequently used by many researchers, the findings of cross-sectional studies are particularly vulnerable to the recollection bias and to the dangers of post-facto rationalization. To minimize this bias, we encouraged the respondents to cite specific examples that involved the recollection of names, dates, etc. to aid their recall (Adams et al., 1998; Alam and Perry, 2002), interviewed multiple informants from each case firm, and compared their responses with the information collected from other data sources such as the internal firm documents and archival records wherever possible. However, we cannot completely rule out the possibility that recollection of past events on the parts of the respondents may have contributed to a bias in the results obtained. A possible avenue for further research would be a longitudinal investigation into the use of Unsolicited Customer Input in the NSD activities that follows multiple NSD projects for a set of service firms over an extended period of time.

Finally, the belief that science can produce objective knowledge rests on two key assumptions: first, the ontological assumption that there is an objective reality out there to be known, and secondly that it is possible to remove all subjective bias in the assessment of that reality. These assumptions are usually criticized by those from a constructivist perspective, who believe that there can be no 'pure' data as all data are mediated by our own reasoning as well as that of participants (Silverman, 1993). To the extent this critic applies to our findings, it requires that the findings of this study are taken only as a mixed indicator of the underlying reality.

6.2.2 The survey-based essays

The survey-based essays presented in chapters 4 and 5 empirically test the conceptual framework put forward in chapter 3. While our initial framework presented in chapter 3 was driven predominantly by theory, our revised framework that was ultimately tested in chapters 4 and 5 was heavily influenced by the findings of our case studies conducted prior to the survey. Although the influence of case studies may help increase the relevance and credibility of the survey findings for the practitioners, it may have also resulted in the survey focusing only on a subset of the constructs that may play an important role within the NSD / service innovation domain. Although our choice of constructs can be justified given our stated focus on the role of Unsolicited Customer Input in the NSD process, there may be other viable constructs in addition to those examined in the survey-based study that justify empirical investigation in the future. It would be useful to evaluate the constructs examined in this study alongside such additional constructs to assess whether the results obtained here hold even in the presence of these additional constructs. Further studies are also warranted to answer the questions such as: Are the process stages identified in this research appropriate for different service industries? Does the Unsolicited Customer Input always drive the firm towards more incremental innovation, or are there any factors that influence this? How does customer input received through different communication channels differ in terms of its value to the firm in improving existing services vs. coming up with new services altogether? How does an organization's utilization of Unsolicited Customer Input in NSD drive its competitors' actions, and how does that ultimately affect the collective state of NSD in a particular industry?

While considered adequate by the conventional standards, our relatively modest sample size relative to the number of constructs estimated and the complexity of the theoretical framework may raise a concern around the statistical power of our findings. This limitation is commonly faced by many empirical studies (Menor and Roth, 2008; Parasuraman, Zeithaml, and Malhotra, 2005) that have to carefully balance the inherent tradeoff between model complexity and statistical power. Also, since the results are driven by the data collected through a single survey instrument, common method bias is a potential measurement issue associated with the analysis presented in chapters 4 and 5. Although the fact that the survey was a multi-respondent survey that required different individuals to answer different parts of the survey does somewhat alleviate this concern, we cannot completely rule out the presence of any common method bias.

Another important limitation stems from the nature of the proof required to guarantee causality. According to Hume (1739-40/1965), establishing a causal connection between two events require four conditions to be met: a constant conjunction, an antecedence, a contiguity, and a necessity. Given the cross-sectional nature of data, antecedence can only be speculated and not guaranteed. Hume (1739-40/1965) and Popper (1959) also claim that no finite number of observations can ever justify a universal conclusion. In other words, it is not possible to generalize with any certainty from events which we have experienced to those which we have not yet experienced and which remain unknowable.

Surveys generally supply correlations and not causations. In order to establish causal relations from cross-sectional analyses, one has to show that there is a relationship as evidenced by a chi square correlation coefficient which holds in various situations under varying conditions, that the relationship is non-spurious (not being caused by a third variable), and that a temporal order has been established. Since cross-sectional studies can't generally establish temporal order, a degree of intuition or common sense are required to establish that the cause precedes the effect (Bryman, 1993). Although applicable to many data collection methods in social

science, this limitation potentially limits the claims of causality that can be made from our analysis of the survey data.

Finally, the generalizability of our findings may be partially limited by our sample of service firms, data collection method used, and the indicators used for the constructs of interest. While we have relied as much as we can on the indicators used in published research to measure the relevant constructs, we have also introduced a few new indicators. Although we have followed the best-practice methods of scale development to establish scale reliability and validity, the use of these newly introduced items in subsequent empirical studies would lend more credence to these items.

6.3 Concluding Remarks

For quite some time, researchers as well as practitioners alike have considered service innovation to be one of the key criterions for the continued success of service firms. As one of the key sources of ideas for innovation, customers have been considered an important contributor to a firm's innovation efforts (Menor and Roth, 2008). The central construct of this thesis has been Unsolicited Customer Input which is similar to passively collected customer feedback described by Sampson (1996; 1999). The nature of this construct has been explored carefully in chapter 2. Whilst this construct is robust, there is clearly a spectrum from collecting the feedback that comes through the channels provided by the company to the customers, to capturing feedback from external sources such as social media or from intermediaries such as front line staff. There is scope for the broad area of unsolicited feedback to be explored at a more detailed level. This could include understanding the relative strength of each channel and how the use of channels and associated feedback might vary from one service context to another.

The research presented here provides insights into the process that the firms looking to leverage Unsolicited Customer Input to drive service innovation need to follow, and the factors that impact a firm's ability to derive innovation-driving insights from the Unsolicited Customer Input. It identifies the internal firm policies and procedures that can help a firm in leveraging customer input by receiving, capturing and analyzing customer input to obtain insights that can drive the firm's innovation efforts. It also provides insights into the impact of using Unsolicited Customer Input in NSD on the firm's innovation efforts by highlighting important factors that affect such use and the impact of such use on the success achieved by the firm's innovation and NSD efforts. Thus, our research makes a case for the service firms to seriously consider leveraging the Unsolicited Customer Input into the firm's innovation activities by highlighting the benefits, and guides them in going about it by delineating the factors that have a significant impact on such use.

Through an investigation of the unsolicited customer involvement in NSD, this research examines several previously unexplored elements of customer involvement in NSD and their links to the NSD process. It identifies the ways in which new service can be developed with the help of Unsolicited Customer Input, and provides insights into some of the key stages of the process that can connect the unsolicited input to the NSD activities. The findings of this research can lead to various related lines of inquiries that can collectively advance our understanding of this relatively nascent area of research. There remains much to learn about the customer-oriented NSD process, the impact of customer heterogeneity on the process and the benefits of customer involvement in NSD (Ponsignon et al., 2011), and how different

customer feedback mechanisms (Caemmerer and Wilson, 2010) including the two modes of engaging with the customer – i.e. through the use of Solicited Customer Input and through the use of Unsolicited Customer Input, can be collectively used most effectively in developing successful new services. Another important avenue for research is the exploration of “what” the firms need to do with the unsolicited customer feedback in order to drive service innovation. This study focused predominantly on “how” the firms can leverage Unsolicited Customer Input in NSD by focusing on the process connecting the Unsolicited Customer Input with the NSD activities, and the factors that may impact such a process. Future research should examine the equally important question of “what” the firms can do with the input by investigating the contextual variables that affect the contents of customer input, and how understanding the contents of Unsolicited Customer Input can allow the firms to drive service innovation and NSD. Collectively, this knowledge of “how” and “what” can the firms do to involve customers in service innovation through the use of Solicited and Unsolicited Customer Input can go a long way in improving our understanding of service innovation.

One of the issues with any research program, and in particular a doctoral research, is that the environment and context can change considerably during the process of research and writing. In the case of this thesis, a particular example is the evolution of social media. Its impact on the way services are designed, marketed, bought, produced, and consumed has resulted in the firms having to push the envelope when it comes to creating new services. When the research presented in this thesis started about four years ago, internet was still considered a passive medium that simply supported the primary channels through which the firms interacted with their customers, and social media was still in its infancy. Over the last four years, things have changed to such an extent that the internet has become the starting point for a majority of the service firms and their customers to connect with one another. Social media has become one of the most powerful channels through which existing as well as potential customers of services exchange their expectations, experiences, and evaluations of service encounters with the rest of the world. This research initially focused mostly on the direct Unsolicited Customer Input – the unsolicited feedback given by the customers directly to the firm. However, findings from the case research quickly prompted us to include the equally important category of indirect Unsolicited Customer Input – the unsolicited customer feedback that is expressed elsewhere (increasingly through social media and the rest of the internet). Although findings from the subsequent survey showed that most of the organizations are still coming to terms with this change, it will be important for the researchers in the domain of service innovation to continue to examine the interplay of the rise of social media and the role played by the Unsolicited Customer Input in NSD and service innovation. More broadly, as pointed out by Ponsignon et al., (forthcoming), this evolution of e-businesses, internet, and social media may require a rethink of many Service Operations Management (SOM) frameworks that were developed before the advent of the internet and the wide-scale adoption of information technology in businesses. It is hoped that research presented here will further the interest in these lines of inquiry, and lead to a stream of research that further improve our understanding of service innovation including the role of customers in driving service innovation.

Figure 6.1 The Process of using Unsolicited Customer Input in NSD

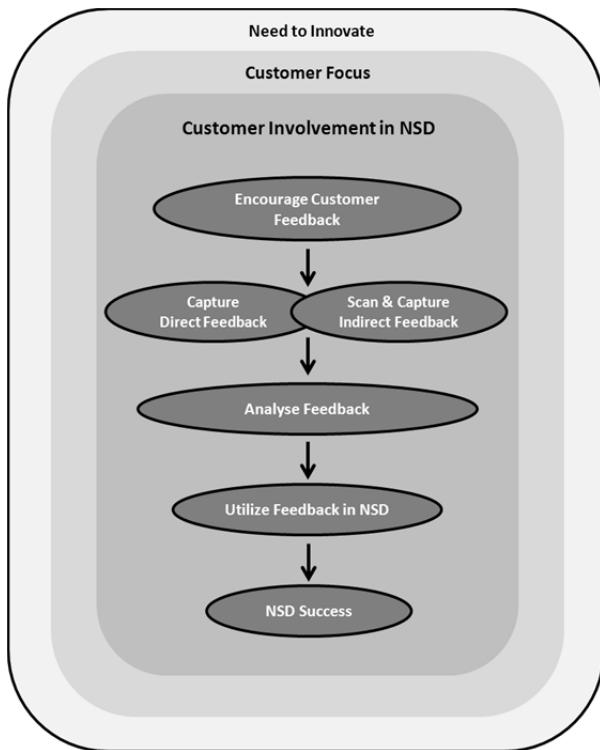
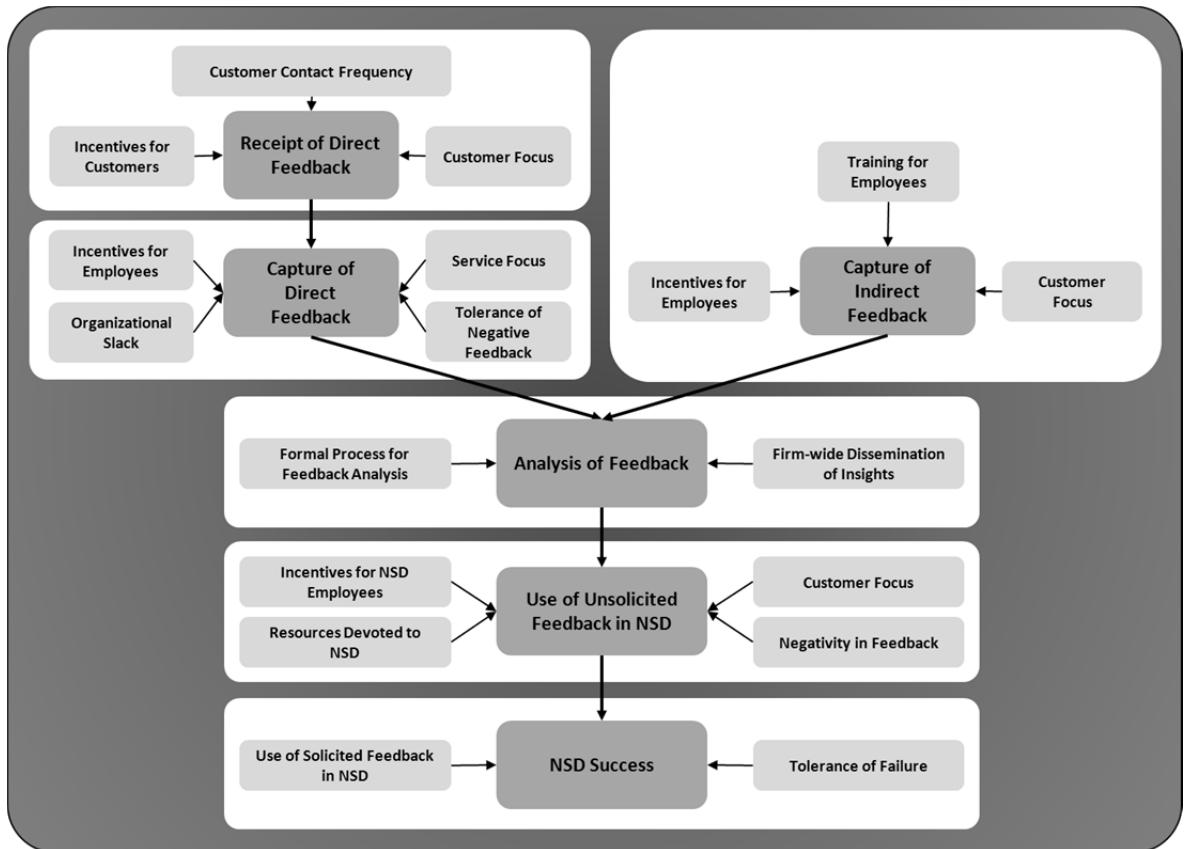


Figure 6.2 Factors Affecting the Use of Unsolicited Customer Input in NSD



Appendices:

Appendix 1: Case Research Interview Protocol

The interview protocol shows the list of topics addressed in the interviews with the case study firms.

Introduction:

1. Respondent background: current job title, number of years in the position, roles & responsibilities
2. Main service offerings of the firm: value proposition, current and historic competitive position
3. Corporate goals for the coming years

Customer feedback handling:

4. Broad overview of the firm's customer care processes including the process for handling customer feedback; channels made available by the firm to the customers; actions usually taken by the firm on complaints, complements, and other feedback; training, incentives, and performance measurement of customer care personnel
5. Path taken by customer compliments, complaints, and other feedback, once they are received by the firm
6. The firm's outlook on customer satisfaction, and details of service guarantees and service recovery procedures (if any)
7. Factors that affect the frequency and content of customer feedback received by the firm
8. Factors that affect the handling of customer feedback received by the firm
9. Details of other individuals with good knowledge of the firm's customer care activities

NSD and Customer involvement in NSD:

1. Broad overview of the firm's NSD activities including objectives, scope and formality of the group, and the criticality of NSD success for achieving corporate goals of the firm
2. NSD process: stakeholders; sources of ideas for innovation; project initiation and funding; process stages; rate at which innovations are pursued; performance evaluation criteria for new services; training, incentives, and performance measurement of NSD personnel
3. Customer involvement in NSD: why (why are the customers involved in NSD), who (who are the customers that get involved in the process), how (how does the firm go about obtaining customer input), when (in which stages of the NSD process does the firm solicit the customers' involvement), where (where does the interaction take place), what (what inputs do the customer provide)
4. Factors that affect customer involvement in NSD
5. Challenges and benefits of involving customers in NSD
6. Types of innovation pursued by the firm, and tolerance of failure
7. Performance of new services introduced by the firm in last three years

Appendix 2: Case Research Data Collection Summary

Case Firm	Nature of Services	Location	Founded	Interviews Conducted		Interviewees
				Conducted	Interviewees	
A	Customized software development service provider (B2B)	Global	2000	3	<ul style="list-style-type: none"> • Chief Executive (2x) • Product Manager 	
B	Web-based specialist tour and travel operator (B2C)	UK	1998	1	<ul style="list-style-type: none"> • Chief Executive 	
C	Automobile servicing & MOT testing specialist (B2C)	UK	2006	4	<ul style="list-style-type: none"> • Chief Executive (2x) • Regional Operations Director • Marketing Director 	
D	Not-for-profit, facilitating collaboration between universities and businesses to promote R&D (B2B)	UK	2001	1	<ul style="list-style-type: none"> • Chief Executive 	
E	Web-based management and leadership training portal (B2C)	UK	1996	4	<ul style="list-style-type: none"> • Chief Executive (2x) • Data Analytics Manager • Customer Support Executive 	
F	Online fieldwork and panel specialist (B2B)	Global	2000	9	<ul style="list-style-type: none"> • European Operations Director (2x) • UK Operations Director • Service Delivery Director • Head of Client Development • Head of Customer Support • Customer Support Executive • Head of Panel Management • Director of Programming 	
G	Financial and administration outsourcing provider (B2B)	UK	1999	1	<ul style="list-style-type: none"> • Chief Executive 	
H	Specialist tour and travel operator (B2C)	UK	1989	1	<ul style="list-style-type: none"> • Operations Director 	

Appendix 3: Survey Construct Items and Supporting Literature used in Chapter 4

The measurement items utilized for each of the latent constructs examined in chapter 4 are summarized in this appendix. The survey asked the respondents to “*indicate, by circling the corresponding number, the extent to which you agree or disagree with the following statements as they pertain to your business unit*” (scaled 1 to 7, where 1: strongly disagree, to 7: strongly agree).

Customer contact frequency: “Customer contact frequency” refers to the extent to which the customers get in touch with the firm over the lifecycle of the service.

Measurement Item Description	Measurement Item Source
How frequently does an average customer / user NEED TO interact with the firm during the life cycle of a product / service? ^c	Industry experts and other researchers
How frequently does an average customer / user ACTUALLY interact with the firm during the life cycle of a product / service? ^c	Industry experts and other researchers

Industry clockspeed: “Industry clockspeed” is a measure of the velocity of change in the external business environment and sets the pace of the firms’ internal operations.

Measurement Item Description	Measurement Item Source
In our industry, customers look for new products / services all the time ^c	Storey and Kahn (2010)
In our industry, taste and preferences of customers change very quickly ^c	Amoako-Gyampah Boye (2001), Kocabasoglu et al. (2007), Storey and Kahn (2010), Vázquez-Bustelo et al. (2007), Ward et al. (1995)
In our industry, the rate of innovation in products and services is rapid ^c	Amoako-Gyampah Boye (2001), Anand Ward (2004), Kocabasoglu et al. (2007), Vázquez-Bustelo et al. (2007), Ward et al. (1995)
In our industry, the rate of innovation in operations processes is rapid ^c	Kocabasoglu et al. (2007), Vázquez-Bustelo et al. (2007), Ward et al. (1995)
In our industry, products and services become outdated rapidly ^b	Amoako-Gyampah Boye (2001), Anand Ward (2004), Kocabasoglu et al. (2007), Ward et al. (1995)

Customer focus: “Customer focus” refers to an organization’s concern for customers as reflected in the policies and practices adopted by the firm.

Measurement Item Description	Measurement Item Source
We strive to be highly responsive to our customers' needs ^c	Ahmad and Schroeder (2001), Chen and Paulraj (2004), Craighead et al. (2009), Flynn and Saladin (2001), Flynn et al. (1995), Kristal et al. (2010), Scott et al. (2009)
Our organization is more customer focused than are our competitors ^c	Douglas and Fredendall (2004), Ordanini and Maglio (2009)

We rapidly attend to complaints from our customers ^c	Craighead et al. (2009), Lee et al. (2003), Prajogo et al. (2008), Samson and Terziovski (1999)
We regularly measure our customers' satisfaction with our products / services ^b	Chen and Paulraj (2004), Jambulingam et al. (2005), Li et al. (2005), Lo et al. (2007), Ordanini and Maglio (2009), Prajogo et al. (2008), Samson and Terziovski (1999), Scott et al. (2009)
We view customers as potential and valuable sources of new offering ideas and opportunities ^c	Barnes and Rowbotham (2004), Menor and Roth (2007, 2008), Schilling and Hill (1998)
Our employees always make customer satisfaction their top goal ^a	Brown and Eisenhardt (1995), Cooper et al. (1994), Griffin and Hauser (1993)
Our service firm details customers' needs so that we can offer customized products and services ^a	Hays and Hill (2001)
Customer complaints are used as a method to initiate improvements in our current processes ^a	Cooper and Kleinschmidt (1995), Cooper et al. (1994)
We determine our customers' satisfaction relative to customers' satisfaction with competitors (Black and Porter, 1996). ^a	Samson and Terziovski (1999); Sila and Ebrahimpour (2005), Hays and Hill (2001)
customer satisfaction is an extremely important part everyone's job at our firm ^a	Sila and Ebrahimpour (2005)
	Hays and Hill (2001)

Service focus: “Service focus” refers to an organization’s concern for delivering a specific level of service as reflected in the policies and practices adopted by the firm.

Measurement Item Description	Measurement Item Source
Our firm offers an explicit product / service guarantee ^c	Industry experts and other researchers
The product / service guarantee offered by our firm is the best in the industry ^c	Industry experts and other researchers
Our firm has an explicit customer recovery (turning around a negative experience a customer has had with the firm's product / service) policy ^c	Industry experts and other researchers
Our firm has the most customer-friendly customer recovery policy in the industry ^c	Industry experts and other researchers

Channels for customers to get in touch with the firm: “Channels for customers to get in touch with the firm” refers to the provision and availability of different communication channels that the customers can use to get in touch with the firm.

Measurement Item Description	Measurement Item Source
Number of channels made available to the customers to help them reach the firm (such as in-person, phone, fax, email, internet) ^c	Industry experts and other researchers
Number of hours for which each channel is available to the customers every day ^c	Industry experts and other researchers

Ease with which the customers can reach senior firm personnel, if they wish to^b

Industry experts and other researchers

Incentives for customers to get in touch with the firm: “Incentives for customers” refers to the ways a firm motivates its customers to engage in a dialogue with and provide input to the firm.

Measurement Item Description	Measurement Item Source
Our firm offers monetary incentives to encourage the customers to provide valuable feedback to the firm ^c	Industry experts and other researchers
Our firm offers non-monetary incentives to encourage the customers to provide valuable feedback to the firm ^c	Menor and Roth (2007, 2008)
Our incentive system is able to recognize the customers who contribute the most to the firm's success ^a	Ahmad and Schroeder (2003)

Receipt of direct customer input: “Receipt of direct customer input” refers to the extent to which the customers contact the firm to provide input on existing products and services.

Measurement Item Description	Measurement Item Source
Customers with a product / service problem rarely complain to us ^b	Industry experts and other researchers
Customers frequently contact us with ideas on how we can do things differently or better ^c	Industry experts and other researchers
Customers always tell us how well our product / service meets and / or exceeds their expectations ^c	Industry experts and other researchers

Formal processes for customer contact employees: “Formal process for customer contact employees” refers to the existence and extent of formal process that the customer contact employees of the firm follow in capturing direct customer input.

Measurement Item Description	Measurement Item Source
Our firm has a dedicated customer-contact department ^b	Menor and Roth (2007, 2008)
Our firm has formal / written procedures for handling customer contact ^c	Tatikonda and Montoya-Weiss (2001), Lo et al. (2007), Menor and Roth (2007, 2008)
Our customer-contact personnel always follow these procedures for handling customer contact ^c	Tatikonda and Montoya-Weiss (2001)
We have formal procedures for collecting customer input ^a	Lo et al. (2007)

Training for customer contact employees: “Training for customer contact employees” refers to the existence, formality, and coverage of specific training for the customer contact employees that trains them in capturing direct customer input.

Measurement Item Description	Measurement Item Source
Our employees are trained in how to handle product / service failures and customer complaints ^c	Goldstein (2003), Menor and Roth (2007, 2008)
Our employees are trained in how to handle customer input other than complaints (e.g. praise, what else can the firm do etc.) ^b	Industry experts and other researchers
Our employees are trained on what customer and incidence details to capture while interacting with the customer ^c	Industry experts and other researchers
The training process for customer-contact employees is very structured and formal in our firm ^c	Snell and Dean (1992), Menor and Roth (2007, 2008)
We place very high priority on training customer-contact employees before they are put on the job ^a	Snell and Dean (1992)
Most of our customer-contact personnel have already received this training ^c	Snell and Dean (1992)

Incentives for customer contact employees: “Incentives for customer contact employees” refers to the ways a firm motivates its customer contact personnel to capture direct customer input.

Measurement Item Description	Measurement Item Source
Our firm incentivizes customer-contact personnel to do the best they can to fully address a customer concern ^c	Industry experts and other researchers
Our firm incentivizes customer-contact personnel to capture all relevant customer and incidence details while interacting with the customer ^c	Industry experts and other researchers
Our firm offers monetary incentives to encourage the customer contact personnel to achieve the departmental objectives ^a	Ahmad and Schroeder (2003)
Our firm offers non-monetary incentives to encourage the customer contact personnel to achieve the departmental objectives ^a	Menor and Roth (2007, 2008)

Slack provided for direct customer input capture: “Slack provided for direct customer input capture” refers to the latitude provided to the firm employees in terms of time that they need to take to capture direct customer input.

Measurement Item Description	Measurement Item Source
We allow our employees to take all the time they need to understand, record and act on customer feedback properly ^c	Nohria and Gulati (1996)

Negativity in the direct customer input: “Negativity in the direct customer input” refers to the extent to which the direct customer input received by the firm is negative.

Measurement Item Description	Measurement Item Source
The direct customer feedback that we receive in any period is (mostly negative...to...mostly positive) ^c	Industry experts and other researchers
The direct customer feedback that we record in any period is (mostly negative...to...mostly positive) ^c	Industry experts and other researchers

Tolerance of negative customer input: “Tolerance of negative customer input” refers to the firm climate that is open to and values negative customer input.

Measurement Item Description	Measurement Item Source
Our firm has an open culture that considers negative feedback as an opportunity to learn and improve ^c	Industry experts and other researchers

Capture of direct customer input: “Capture of direct customer input” refers to the extent to which the firm employees actually capture the direct customer input received by the firm.

Measurement Item Description	Measurement Item Source
Our customer contact personnel ACTUALLY record most of the complaints received from the customers ^c	Industry experts and other researchers
Our customer contact personnel ACTUALLY record most of the positive feedback received from the customers ^b	Industry experts and other researchers
Our customer contact personnel ACTUALLY record most of the suggestions received from the customers ^c	Industry experts and other researchers
Our customer contact personnel ACTUALLY capture most of the relevant customer contact details when they record customer feedback ^c	Industry experts and other researchers
These details are always used by our firm afterwards to keep the customer in the loop in terms of the action taken by the firm on the feedback ^b	Industry experts and other researchers

Formal processes for indirect customer input capture: “Formal process for indirect customer input capture” refers to the existence and extent of formal process that the firm employees follow in scanning for and capturing indirect customer input.

Measurement Item Description	Measurement Item Source
Our firm has a dedicated department responsible for scanning and recording indirect customer feedback ^c	Menor and Roth (2007, 2008)

Scanning and recording indirect customer feedback is part of the formal / written job specification for some of our employees ^c	Industry experts and other researchers
Our firm has formal / written procedures for scanning and recording indirect customer feedback ^c	Tatikonda and Montoya-Weiss (2001), Lo et al. (2007), Menor and Roth (2007, 2008)
Our staff responsible for collecting indirect customer feedback ACTUALLY follows these procedures ^c	Tatikonda and Montoya-Weiss (2001)

Training for indirect customer input capture: “Training for indirect customer input capture” refers to the existence, formality, and coverage of specific training for the firm employees that trains them in capturing indirect customer input.

Measurement Item Description	Measurement Item Source
Our staff responsible for collecting indirect customer feedback is trained on how to look for and record indirect customer feedback ^c	Goldstein (2003), Menor and Roth (2007, 2008)
Our staff responsible for collecting indirect customer feedback is trained on what customer and incidence details to capture while reviewing the indirect customer feedback ^a	Industry experts and other researchers
We place very high priority on training staff responsible for collecting indirect customer feedback before they are put on the job ^a	Snell and Dean (1992)
The training process for our staff responsible for collecting indirect customer feedback is very structured and formal ^c	Snell and Dean (1992), Menor and Roth (2007, 2008)
Most of our staff responsible for collecting indirect customer feedback have already received this training ^c	Snell and Dean (1992)

Incentives for indirect customer input capture: “Incentives for indirect customer input capture” refers to the ways a firm motivates its personnel to scan the environment for and capture indirect customer input.

Measurement Item Description	Measurement Item Source
Our firm incentivizes these employees to scan as many instances of indirect customer feedback as possible ^c	Industry experts and other researchers
Our firm incentivizes these employees to record as many actionable instances of indirect customer feedback as possible ^c	Industry experts and other researchers
Our firm offers monetary incentives to those responsible for reviewing indirect customer feedback to achieve the departmental objectives ^a	Ahmad and Schroeder (2003)
Our firm offers non-monetary incentives to those responsible for reviewing indirect customer feedback to achieve the	Menor and Roth (2007, 2008)

departmental objectives^a

Our incentive system encourages those responsible for reviewing indirect customer feedback to capture positive as well as negative feedback ^a	Industry experts and other researchers
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Negativity in the indirect customer input: “Negativity in the indirect customer input” refers to the extent to which the indirect customer input scanned and captured by the firm is negative.

Measurement Item Description	Measurement Item Source
The indirect customer feedback that we scan in any period is ^c	Industry experts and other researchers
The indirect customer feedback that we record in any period is ^c	Industry experts and other researchers

Indirect customer input facilitation: “Indirect customer input facilitation” refers to the firm activities such as hosting a discussion forum where firm’s customers can express their views regarding the firm’s products and services.

Measurement Item Description	Measurement Item Source
Our firm hosts a forum that customers can use to communicate with the firm and other customers of our products / services ^c	Industry experts and other researchers

Capture of indirect customer input: “Capture of indirect customer input” refers to the extent to which the firm employees scan and capture the indirect customer input.

Measurement Item Description	Measurement Item Source
Our firm scans social media such as Facebook and Twitter for indirect customer feedback ^c	Industry experts and other researchers
Our firm scans the press and other public domain areas for indirect customer feedback ^c	Industry experts and other researchers
Our firm scans online forums related to our business for indirect customer feedback ^c	Industry experts and other researchers

Formal processes for customer input analysis: “Formal process for customer input analysis” refers to the existence and extent of formal process that the firm employees follow in analyzing customer input.

Measurement Item Description	Measurement Item Source
Our firm has a dedicated department that analyses customer feedback ^c	Menor and Roth (2007, 2008)
Our firm has formal / written rules and procedures for analysing customer feedback ^c	Tatikonda and Montoya-Weiss (2001), Lo et al. (2007), Menor and Roth (2007, 2008)

Our employees always follow these rules and procedures while analysing customer feedback ^b	Tatikonda and Montoya-Weiss (2001)
Formal / written procedures exist for documenting the “lessons learned” from customer feedback ^b	Storey and Kahn (2010)
Evaluation of customer feedback is a formal activity in our firm ^c	Chen and Paulraj (2004), Li et al. (2005)

Training for customer input analysis: “Training for customer input analysis” refers to the existence, formality, and coverage of specific training for the firm employees that trains them in the analysis of customer input.

Measurement Item Description	Measurement Item Source
These employees are trained on how to analyze customer feedback ^c	Goldstein (2003), Menor and Roth (2007, 2008)
The training process for the employees responsible for analysing customer feedback is very structured and formal ^c	Snell and Dean (1992), Menor and Roth (2007, 2008)
We place very high priority on training employees before they start analysing customer input ^a	Snell and Dean (1992)
Most of the employees responsible for analysing customer feedback have already received this training ^c	Snell and Dean (1992)

Incentives for customer input analysis: “Incentives for customer input analysis” refers to the ways a firm motivates its NSD personnel to utilize customer input in NSD.

Measurement Item Description	Measurement Item Source
Our firm incentivizes these employees to analyse as many instances of customer feedback as possible ^c	Industry experts and other researchers
Our firm incentivizes these employees to find as many actionable customer insights as possible ^c	Industry experts and other researchers
Our firm offers monetary incentives to the personnel responsible for analysing customer input to achieve the departmental objectives ^a	Ahmad and Schroeder (2003)
Our firm offers non-monetary incentives to the personnel responsible for analysing customer input to achieve the departmental objectives ^a	Menor and Roth (2007, 2008)
Our incentive system does a very good job of recognizing those customer input analysis employees who achieve the departmental objectives ^a	Ahmad and Schroeder (2003)

Slack provided for customer input analysis: “Slack provided for customer input analysis” refers to the latitude provided to the firm employees in terms of time that they need to take to analyze the customer input and extract insights that can help firms improve existing products & services and come up with new offerings.

Measurement Item Description	Measurement Item Source
We allow our employees to take all the time they need to analyse customer feedback properly ^c	Nohria and Gulati (1996)

Experienced personnel for customer input analysis: “Experienced personnel for customer input analysis” refers to the extent to which the task of customer input analysis is carried out by senior or experienced firm personnel.

Measurement Item Description	Measurement Item Source
The employees responsible for analysing customer feedback in our firm are very experienced and knowledgeable about the firm and the market ^c	Industry experts and other researchers

Dissemination of customer input across the firm: “Dissemination of customer input across the firm” refers to the distribution of learning derived from customer input, across various departments within the firm.

Measurement Item Description	Measurement Item Source
Our firm encourages sharing of customer insights across departments ^b	Vázquez-Bustelo et al. (2007)
Our firm uses structured channels and formal mechanisms to share customer insights across the firm ^c	Menor and Roth (2007, 2008)
A summary of customer satisfaction / complaints is given to our senior managers regularly ^b	Ahire et al. (1996), Samson and Terziovski (1999), Prajogo et al. (2008), Scott et al. (2009)
Customer feedback data is regularly disseminated at all levels in our firm ^c	Ordanini and Maglio (2009), de Jong and de Ruyter (2004), Hays and Hill (2001)
We communicate information about our customer experiences across all business functions ^a	Samson and Terziovski (1999), Prajogo et al. (2008), Scott et al. (2009)
Databases containing customer insights are accessible to employees across departments ^a	Vázquez-Bustelo et al. (2007)

Usefulness of UCI insights: “Usefulness of UCI insights” refers to the extent to which the firm employees find the customer input helpful in resolving customer issues, improving existing products and services, and in coming up with new products and services.

Measurement Item Description	Measurement Item Source
The feedback provided by the customers is generally useful for addressing the issues of	Industry experts and other researchers

customer concern ^b

The feedback provided by the customers is generally useful for improving the products / services concerned ^c

Industry experts and other researchers

The feedback provided by the customer is generally useful for designing new products / services ^c

Industry experts and other researchers

The feedback provided by the customer is generally useful for the entire firm ^a

Industry experts and other researchers

^a These items were retained after the item-sorting analysis

^b These items were retained after the exploratory factor analysis

^c These items were retained for the SEM analysis

Appendix 4: Survey Construct Items and Supporting Literature used in Chapter 5

The measurement items utilized for each of the latent constructs examined in chapter 5 are summarized in this appendix. The survey asked the respondents to “indicate, by circling the corresponding number, the extent to which you agree or disagree with the following statements as they pertain to your business unit (scaled 1 to 7, where 1: strongly disagree, to 7: strongly agree).

Usefulness of UCI insights: “Usefulness of UCI insights” refers to the extent to which the firm employees find the customer feedback helpful in resolving customer issues, improving existing products and services, and in coming up with new products and services. This represents the value placed by the firm on the customer input in helping firm innovate in the long run.

Measurement Item Description	Measurement Item Source
The feedback provided by the customers is generally useful for addressing the issues of customer concern ^b	Industry experts and other researchers
The feedback provided by the customers is generally useful for improving the products / services concerned ^c	Industry experts and other researchers
The feedback provided by the customer is generally useful for designing new products / services ^c	Industry experts and other researchers
The feedback provided by the customer is generally useful for the entire firm ^a	Industry experts and other researchers

Industry clockspeed: “Industry clockspeed” is a measure of the velocity of change in the external business environment and sets the pace of the firms’ internal operations.

Measurement Item Description	Measurement Item Source
In our industry, customers look for new products / services all the time ^c	Storey and Kahn (2010)
In our industry, taste and preferences of customers change very quickly ^c	Amoako-Gyampah Boye (2001), Kocabasoglu et al. (2007), Storey and Kahn (2010), Vázquez-Bustelo et al. (2007), Ward et al. (1995)
In our industry, the rate of innovation in products and services is rapid ^c	Amoako-Gyampah Boye (2001), Anand Ward (2004), Kocabasoglu et al. (2007), Vázquez-Bustelo et al. (2007), Ward et al. (1995)
In our industry, the rate of innovation in operations processes is rapid ^c	Kocabasoglu et al. (2007), Vázquez-Bustelo et al. (2007), Ward et al. (1995)
In our industry, products and services become outdated rapidly ^b	Amoako-Gyampah Boye (2001), Anand Ward (2004), Kocabasoglu et al. (2007), Ward et al. (1995)

Customer focus: “Customer focus” refers to an organization’s concern for customers as reflected in the policies and practices adopted by the firm.

Measurement Item Description	Measurement Item Source

We strive to be highly responsive to our customers' needs ^c	Ahmad and Schroeder (2001), Chen and Paulraj (2004), Craighead et al. (2009), Flynn and Saladin (2001), Flynn et al. (1995), Kristal et al. (2010), Scott et al. (2009)
Our organization is more customer focused than are our competitors ^c	Douglas and Fredendall (2004), Ordanini and Maglio (2009)
We rapidly attend to complaints from our customers ^c	Craighead et al. (2009), Lee et al. (2003), Prajogo et al. (2008), Samson and Terziovski (1999)
We regularly measure our customers' satisfaction with our products / services ^b	Chen and Paulraj (2004), Jambulingam et al. (2005), Li et al. (2005), Lo et al. (2007), Ordanini and Maglio (2009), Prajogo et al. (2008), Samson and Terziovski (1999), Scott et al. (2009)
We view customers as potential and valuable sources of new offering ideas and opportunities ^c	Barnes and Rowbotham (2004), Menor and Roth (2007, 2008), Schilling and Hill (1998)
Our employees always make customer satisfaction their top goal ^a	Brown and Eisenhardt (1995), Cooper et al. (1994), Griffin and Hauser (1993)
Our service firm details customers' needs so that we can offer customized products and services ^a	Hays and Hill (2001)
Customer complaints are used as a method to initiate improvements in our current processes ^a	Cooper and Kleinschmidt (1995), Cooper et al. (1994)
We determine our customers' satisfaction relative to customers' satisfaction with competitors (Black and Porter, 1996). ^a	Samson and Terziovski (1999); Sila and Ebrahimpour (2005), Hays and Hill (2001)
customer satisfaction is an extremely important part everyone's job at our firm ^a	Sila and Ebrahimpour (2005)
	Hays and Hill (2001)

Training for using UCI in NSD: “Training for using UCI in NSD” refers to the existence, formality, and coverage of specific training for the NSD personnel that trains them in utilizing customer feedback in NSD.

Measurement Item Description	Measurement Item Source
Our NPD / NSD personnel are trained to utilize customer feedback in NSD ^c	Menor and Roth (2007, 2008)
This training process is very structured and formal ^c	Menor and Roth (2007, 2008), Snell and Dean (1992)
We place very high priority on training NSD personnel before they are put on the job ^a	Snell and Dean (1992)
Most of our NPD / NSD personnel have already received this training ^c	Snell and Dean (1992)

Incentives for using UCI in NSD: “Incentives for using UCI in NSD” refers to the ways a firm motivates its NSD personnel to utilize customer feedback in NSD.

6.3.1 Measurement Item Description	Measurement Item Source
The firm offers monetary incentives to encourage the NSD personnel to achieve departmental objectives ^a	Ahmad and Schroeder (2003)

The firm offers non-monetary incentives to encourage the NSD personnel to achieve departmental objectives ^a	Menor and Roth (2007, 2008),
Our firm incentivizes NPD / NSD group members to utilize insights obtained from customer feedback ^c	Ahmad and Schroeder (2003)
The incentives for NSD personnel are at odds with NSD goals (reverse coded) ^a	Ahmad and Schroeder (2003)

Resources devoted to NSD: “Resources devoted to NSD” refers to the existence and resourcing of the NSD function in a firm.

Measurement Item Description	Measurement Item Source
Our firm has a dedicated NPD / NSD department ^c	Menor and Roth (2007, 2008),
The NPD / NSD group has been in existence in our firm for a long time ^c	Industry experts and other researchers
Our firm spends the highest percentage of its revenue on NPD / NSD across firms in the industry ^c	Industry experts and other researchers

Negativity in UCI: “Negativity in UCI” refers to the extent to which the customer feedback that gets utilized in NSD is negative.

Measurement Item Description	Measurement Item Source
The customer feedback that gets utilized in NPD / NSD is ^c	Industry experts and other researchers

Utilization of UCI in NSD: “Utilization of UCI in NSD” refers to the extent to which the firm actually uses unsolicited customer feedback in NSD activities.

Measurement Item Description	Measurement Item Source
Over the last few years, we have frequently improved our existing services by leveraging customer input ^a	Hays and Hill (2001)
Over the last few years, we have frequently come up with entirely new services by leveraging customer input ^a	Hays and Hill (2001)
Our NPD / NSD group members always take customer feedback into account while working on NPD / NSD ^c	Industry experts and other researchers
Utilization of insights obtained from customer feedback is a formal step in our NPD / NSD process ^c	Industry experts and other researchers
Customer requirements are thoroughly analyzed in the new product design process ^b	Ahmad and Schroeder (2001), Flynn and Saladin (2001), Flynn et al. (1999), Jambulingam et al. (2005), Lee et al. (2003)
We utilize the “voice of the customer” throughout our new service development process ^a	Behara and Chase (1993), Bitran and Pedrosa (1998), Cooper and Edgett (1999), Griffin and Hauser (1993), Noon et al. (1997)

Utilization of SCI in NSD: “Utilization of SCI in NSD” refers to the extent to which the firm actually uses Solicited Customer Input in NSD activities.

Measurement Item Description	Measurement Item Source
Our firm always solicits customer involvement in the NPD / NSD process ^c	Ahmad and Schroeder (2001), Flynn and Saladin (2001), Schroeder et al. (2002)
Our firm always involves customers in all stages of the NPD / NSD process ^c	Kaynak and Hartley (2008)
When our firm decides to act on an issue identified through customer feedback, the firm always solicits input from a broader range of customers ^c	Industry experts and other researchers

Tolerance of failure: “Tolerance of failure” refers to an innovation climate that promotes experimentation, risk taking and tolerates failure.

Measurement Item Description	Measurement Item Source
Taking risks is an element of our innovation strategy ^c	Jambulingam et al. (2005)
Our firm is tolerant of new product / service failures ^c	Menor and Roth (2007, 2008)
Our firm encourages entrepreneurial efforts and is accepting of risk-taking efforts ^a	Cooper and Kleinschmidt (1995), Denison and Mishra (1995)

NSD Success: “NSD Success” refers to the marketplace success achieved by the firm’s portfolio of NSD projects initiated over the last 3 to 6 years.

Measurement Item Description	Measurement Item Source
Over the last few years, our firm has frequently improved our existing products / services by leveraging customer input ^c	Hays and Hill (2001)
Over the last few years, our firm has frequently come up with entirely new products / services by leveraging customer input ^c	Hays and Hill (2001)
The degree to which our firm’s NPD / NSD program has been successful in meeting customer requirements for new offerings is very high ^c	Brown and Eisenhardt (1995), Cooper and Edgett (1999), Menor and Roth (2007, 2008), Ordanini and Maglio (2009), Storey and Kahn (2010), Voss et al. (1992)
The percentage of our firm’s NPD / NSD projects launched within the past 3 years that achieved marketplace success is very high ^c	Cooper and Kleinschmidt (1995), Menor and Roth (2007, 2008)
The overall performance / profitability of our firm’s NPD / NSD projects relative to competitors over the past 3 years is very high ^c	Cooper and Kleinschmidt (1995), Menor and Roth (2007, 2008), Roth et al. (1997), Storey and Kahn (2010), Wind and Mahajan (1997)
Our firm’s cost of introducing new products / services relative to competitors is very high ^b	Das (2001)

NSD Speed: “NSD Speed” refers to the firm’s ability to bring the innovations quickly to the market compared to its competition with respect to the firm’s portfolio of NSD projects initiated over the last 3 to 6 years.

Measurement Item Description	Measurement Item Source
Overall speed-to-market performance of new service/product development projects for services introduced over the past 3 years ^a	Brown and Eisenhardt (1995), Cooper et al. (1994), Kessler and Chakrabarti (1996), Roth et al. (1997)
Our firm is generally first in the market in introducing new products / services ^c	Escríg-Tena Bou-Llusar (2005), Hallgren Olhager (2009), Li et al. (2005)
Our time-to-market for developing new products / services is much lower than that of our nearest competition ^c	Calantone et al. (2002), Das (2001), Drogé et al. (2004), Hallgren Olhager (2009), Li et al. (2005), Menor and Roth (2007, 2008), Prajogo et al. (2008), Sarin and McDermott (2003), Swink et al. (2005)
Our firm is more capable than is our competition when it comes to making quick changes to existing products or services ^c	Escríg-Tena Bou-Llusar (2005), Li et al. (2005)

Type of innovation pursued: “Type of innovation pursued” refers to the extent to which the firm’s portfolio of NSD projects initiated over the last 3 to 6 years is similar or dissimilar to the firm’s existing products or services. The innovations that are similar to the firm’s existing products or services are termed “incremental innovations”, whereas the innovations that are very different from the firm’s existing products or services are termed “radical innovations”.

Measurement Item Description	Measurement Item Source
New services have end uses similar to that of the firm’s existing services ^a	Cooper (1985), Cooper and de Brentani (1991)
The majority of our new product / service innovations are (rated as Mostly Incremental to Mostly Radical) ^b	Brockman and Morgan (2003), Ettlie (1997)
New products / services are designed to complement the firm’s current offerings ^c	Menor and Roth (2007, 2008), Tax and Stuart (1997)
New products / services introduced typically fit with the firm’s existing contact personnel skills and resources ^c	Cooper (1985), Cooper and de Brentani (1991), Menor and Roth (2007, 2008), Tax and Stuart (1997)
New services/products introduced typically fit into the existing product mix ^a	Cooper (1985), Easingwood and Storey (1993)

^a These items were retained after the item-sorting analysis

^b These items were retained after the exploratory factor analysis

^c These items were retained for the SEM analysis

Appendix 5: The Survey Instrument

Survey – Have you been listening to your customers?

Instructions:

Thank you for taking part in this survey. We will greatly appreciate if you can complete the survey within two weeks.

The survey is divided in five sections. Please answer the questions to the best of your knowledge. Please feel free to get a colleague to fill up parts of the survey if you believe that they know more about the specific questions.

All the answers you provide here will be treated with strict confidentiality. The anonymous findings from this survey will become part of academic research and may be published as part of an academic thesis, or as part of an article in a scholarly journal.

If you have any questions or need help while filling out the survey, please feel free to contact the lead researcher for this study – Mr. Amit Kakkad on +44 7886255666 or on akakkad.phd2005@london.edu.

Survey:

Please circle / select the most appropriate answer to indicate the extent to which you agree with the following statements:

1. BACKGROUND - COMPETITION, INNOVATION AND CUSTOMERS:

	1= Strongly Disagree; 7= Strongly Agree						
Compared with other industries, rivalry in our industry is very intense	1	2	3	4	5	6	7
Competitive moves in our market are slow and deliberate, with long time gaps between different companies' reactions	1	2	3	4	5	6	7
In our industry, customers are loyal - they rarely switch to new firms or competitors	1	2	3	4	5	6	7
In our industry, customers look for new products / services all the time	1	2	3	4	5	6	7
In our industry, taste and preferences of customers change very quickly	1	2	3	4	5	6	7
In our industry, the rate of innovation in products and services is rapid	1	2	3	4	5	6	7
In our industry, the rate of innovation in operations processes is rapid	1	2	3	4	5	6	7
We strive to be highly responsive to our customers' needs	1	2	3	4	5	6	7
Our organization is more customer focused than are our competitors	1	2	3	4	5	6	7
We rapidly attend to complaints from our customers	1	2	3	4	5	6	7
We regularly measure our customers' satisfaction with our products / services	1	2	3	4	5	6	7
We view customers as potential and valuable sources of new offering ideas and opportunities	1	2	3	4	5	6	7
Our firm offers an explicit product / service guarantee	1	2	3	4	5	6	7
The product / service guarantee offered by our firm is the best in the industry	1	2	3	4	5	6	7
Our firm has an explicit customer recovery (turning around a negative experience a customer has had with the firm's product / service) policy	1	2	3	4	5	6	7
Our firm has the most customer-friendly customer recovery policy in the industry	1	2	3	4	5	6	7

2. RECEIPT OF CUSTOMER INPUT:

Customer input can be categorized as solicited or unsolicited. When the firm specifically contacts the customers for input, the input received is termed Solicited Customer Input (SCI). When the customers provide input without being asked for input, the input is termed Unsolicited Customer Input (UCI).

The unsolicited input can be given directly to the firm - *Direct Unsolicited Customer Input* (D-UCI) or expressed elsewhere (opinions about a firm's products or services expressed in public domain) - *Indirect Unsolicited Customer Input* (I-UCI).

a. Direct Unsolicited Customer Input:

Direct unsolicited customer input refers to input provided by the customers directly to the firm, for example in writing or to a call centre, without the firm specifically asking for the input.

1= Rarely; 7= Always						
How frequently does an average customer / user NEED TO interact with the firm during the life cycle of a product / service?						1 2 3 4 5 6 7
How frequently does an average customer / user ACTUALLY interact with the firm during the life cycle of a product / service?						1 2 3 4 5 6 7

1= Worst; 7= Best						
How does your firm compare with the competition on each of the following?						
Number of channels made available to the customers to help them reach the firm (such as in-person, phone, fax, email, internet)						1 2 3 4 5 6 7
Number of hours for which each channel is available to the customers every day						1 2 3 4 5 6 7
Ease with which the customers can reach senior firm personnel, if they wish to						1 2 3 4 5 6 7

1= Strongly Disagree; 7= Strongly Agree						
Our firm offers monetary incentives to encourage the customers to provide valuable feedback to the firm						1 2 3 4 5 6 7
Our firm offers non-monetary incentives to encourage the customers to provide valuable feedback to the firm						1 2 3 4 5 6 7
Customers with a product / service problem rarely complain to us						1 2 3 4 5 6 7
Customers frequently contact us with ideas on how we can do things differently or better						1 2 3 4 5 6 7
Customers always tell us how well our product / service meets and / or exceeds their expectations						1 2 3 4 5 6 7
The feedback we get from our customers is quite similar across different channels						1 2 3 4 5 6 7
If different, how does the feedback differ by the channel it comes through?						
The feedback we get from our customers located in different geographic regions is quite similar						1 2 3 4 5 6 7
If different, how does the feedback differ by the region it originates from?						

1= Strongly Disagree; 7= Strongly Agree						
Our firm has a dedicated customer-contact department						1 2 3 4 5 6 7
Our firm has formal / written procedures for handling customer contact						1 2 3 4 5 6 7
Our customer-contact personnel always follow these procedures for handling customer contact						1 2 3 4 5 6 7
Our employees are trained in how to handle product / service failures and customer complaints						1 2 3 4 5 6 7
Our employees are trained in how to handle customer input other than complaints (e.g. praise, what else can the firm do etc.)						1 2 3 4 5 6 7
Our employees are trained on what customer and incidence details to capture while interacting with the customer						1 2 3 4 5 6 7
The training process for customer-contact employees is very structured						1 2 3 4 5 6 7

and formal in our firm	1	2	3	4	5	6	7
Most of our customer-contact personnel have already received this training	1	2	3	4	5	6	7
Our firm incentivizes customer-contact personnel to do the best they can to fully address a customer concern	1	2	3	4	5	6	7
Our firm incentivizes customer-contact personnel to capture all relevant customer and incidence details while interacting with the customer	1	2	3	4	5	6	7
Our customer contact personnel ACTUALLY record most of the complaints received from the customers	1	2	3	4	5	6	7
Our customer contact personnel ACTUALLY record most of the positive feedback received from the customers	1	2	3	4	5	6	7
Our customer contact personnel ACTUALLY record most of the suggestions received from the customers	1	2	3	4	5	6	7
Our customer contact personnel ACTUALLY capture most of the relevant customer contact details when they record customer feedback	1	2	3	4	5	6	7
We allow our employees to take all the time they need to understand, record and act on customer feedback properly	1	2	3	4	5	6	7
These details are always used by our firm afterwards to keep the customer in the loop in terms of the action taken by the firm on the feedback	1	2	3	4	5	6	7
Our firm has an open culture that considers negative feedback as an opportunity to learn and improve	1	2	3	4	5	6	7
1= Mostly Negative; 7= Mostly Positive							
The direct customer feedback that we receive in any period is	1	2	3	4	5	6	7
The direct customer feedback that we record in any period is	1	2	3	4	5	6	7

b. **Indirect Unsolicited Customer Input:**

Indirect unsolicited customer input / feedback refers to input provided by the customers indirectly to the firm without the firm specifically asking for the input. This input is generally expressed in the public domain through online forums, reviews, discussion boards etc.

Our firm scans social media such as Facebook and Twitter for indirect customer feedback	1	2	3	4	5	6	7
Our firm scans the press and other public domain areas for indirect customer feedback	1	2	3	4	5	6	7
Our firm scans online forums related to our business for indirect customer feedback	1	2	3	4	5	6	7
Our firm has a dedicated department responsible for scanning and recording indirect customer feedback	1	2	3	4	5	6	7
Scanning and recording indirect customer feedback is part of the formal / written job specification for some of our employees	1	2	3	4	5	6	7
Our firm hosts a forum that customers can use to communicate with the firm and other customers of our products / services	1	2	3	4	5	6	7
Our firm has formal / written procedures for scanning and recording indirect customer feedback	1	2	3	4	5	6	7
Our staff responsible for collecting indirect customer feedback ACTUALLY follows these procedures	1	2	3	4	5	6	7
Our staff responsible for collecting indirect customer feedback is trained on how to look for and record indirect customer feedback	1	2	3	4	5	6	7
The training process for our staff responsible for collecting indirect customer feedback is very structured and formal	1	2	3	4	5	6	7
Most of our staff responsible for collecting indirect customer feedback have already received this training	1	2	3	4	5	6	7
Our firm incentivizes these employees to scan as many instances of	1	2	3	4	5	6	7

indirect customer feedback as possible	1	2	3	4	5	6	7
Our firm incentivizes these employees to record as many actionable instances of indirect customer feedback as possible	1	2	3	4	5	6	7

The indirect customer feedback that we scan in any period is	1	2	3	4	5	6	7
The indirect customer feedback that we record in any period is	1	2	3	4	5	6	7

3. ANALYSIS OF UNSOLICITED CUSTOMER INPUT:

The following questions look at how your firm goes about analysing unsolicited customer input / feedback. Analysing customer trends by looking at the unsolicited customer input is an important activity, but how the firm goes about it can vary considerably.

Our firm emphasizes the evaluation of both formal and informal customer complaints	1	2	3	4	5	6	7
Evaluation of customer feedback is a formal activity in our firm	1	2	3	4	5	6	7
Our firm has a dedicated department that analyzes customer feedback	1	2	3	4	5	6	7
Our firm has formal / written rules and procedures for analyzing customer feedback	1	2	3	4	5	6	7
Our employees always follow these rules and procedures while analyzing customer feedback	1	2	3	4	5	6	7
Formal / written procedures exist for documenting the "lessons learned" from customer feedback	1	2	3	4	5	6	7
We allow our employees to take all the time they need to analyze customer feedback properly	1	2	3	4	5	6	7
A summary of customer satisfaction / complaints is given to our senior managers regularly	1	2	3	4	5	6	7
Customer feedback data is regularly disseminated at all levels in our firm	1	2	3	4	5	6	7
The employees responsible for analyzing customer feedback in our firm are very experienced and knowledgeable about the firm and the market	1	2	3	4	5	6	7
These employees are trained on how to analyze customer feedback	1	2	3	4	5	6	7
The training process for the employees responsible for analyzing customer feedback is very structured and formal	1	2	3	4	5	6	7
Most of the employees responsible for analyzing customer feedback have already received this training	1	2	3	4	5	6	7
Our firm incentivizes these employees to analyse as many instances of customer feedback as possible	1	2	3	4	5	6	7
Our firm incentivizes these employees to find as many actionable customer insights as possible	1	2	3	4	5	6	7
Our firm encourages sharing of customer insights across departments	1	2	3	4	5	6	7
Our firm uses structured channels and formal mechanisms to share customer insights across the firm	1	2	3	4	5	6	7
The feedback provided by the customers is generally useful for addressing the issues of customer concern	1	2	3	4	5	6	7
The feedback provided by the customers is generally useful for improving the products / services concerned	1	2	3	4	5	6	7
The feedback provided by the customer is generally useful for designing new products / services	1	2	3	4	5	6	7

4. USE OF CUSTOMER INPUT IN INNOVATION:

The following questions look at how your firm goes about using customer input / feedback in innovation. While these activities may include improving existing products / services and developing new products / services, here they are broadly referred to as NPD (New Product Development) and NSD (New Service Development) activities.

1= Strongly Disagree; 7= Strongly Agree
Survey: Have you been listening to your customers?

Our firm has a dedicated NPD / NSD department	1	2	3	4	5	6	7
The NPD / NSD group has been in existence in our firm for a long time	1	2	3	4	5	6	7
Our firm spends the highest percentage of its revenue on NPD / NSD across firms in the industry	1	2	3	4	5	6	7
1= Mostly incremental; 7= Mostly radical							
The majority of our new product / service innovations are	1	2	3	4	5	6	7
Incremental Innovation: Innovations that improve existing process / product / service by building on existing knowledge and resources within the firm							
Radical Innovation: Innovations that result in development of new process / product / service, and require completely different knowledge and/or resources than what the firm currently has							
1= Strongly Disagree; 7= Strongly Agree							
New products / services are designed to complement the firm's current offerings	1	2	3	4	5	6	7
New products / services introduced typically fit with the firm's existing contact personnel skills and resources	1	2	3	4	5	6	7
Taking risks is an element of our innovation strategy	1	2	3	4	5	6	7
Our firm is tolerant of new product / service failures	1	2	3	4	5	6	7
Utilization of insights obtained from customer feedback is a formal step in our NPD / NSD process	1	2	3	4	5	6	7
Our NPD / NSD personnel are trained to utilize customer feedback in NSD	1	2	3	4	5	6	7
This training process is very structured and formal	1	2	3	4	5	6	7
Most of our NPD / NSD personnel have already received this training	1	2	3	4	5	6	7
Our firm incentivizes NPD / NSD group members to utilize insights obtained from customer feedback	1	2	3	4	5	6	7
Our NPD / NSD group members always take customer feedback into account while working on NPD / NSD	1	2	3	4	5	6	7
1= Mostly Negative; 7= Mostly Positive							
The customer feedback that gets utilized in NPD / NSD is	1	2	3	4	5	6	7
1= Strongly Disagree; 7= Strongly Agree							
Our firm always solicits customer involvement in the NPD / NSD process	1	2	3	4	5	6	7
Our firm always involves customers in all stages of the NPD / NSD process	1	2	3	4	5	6	7
When our firm decides to act on an issue identified through customer feedback, the firm always solicits input from a broader range of customers	1	2	3	4	5	6	7
Our firm is generally first in the market in introducing new products / services	1	2	3	4	5	6	7
Our time-to-market for developing new products / services is much lower than that of our nearest competition	1	2	3	4	5	6	7
Our firm is more capable than is our competition when it comes to making quick changes to existing products or services	1	2	3	4	5	6	7
Over the last few years, our firm has frequently improved our existing products / services by leveraging customer input	1	2	3	4	5	6	7
Over the last few years, our firm has frequently come up with entirely new products / services by leveraging customer input	1	2	3	4	5	6	7
The degree to which our firm's NPD / NSD program has been successful in meeting customer requirements for new offerings is very high	1	2	3	4	5	6	7
The percentage of our firm's NPD / NSD projects launched within the past 3 years that achieved marketplace success is very high	1	2	3	4	5	6	7
The overall performance / profitability of our firm's NPD / NSD projects relative to competitors over the past 3 years is very high	1	2	3	4	5	6	7
Our firm's cost of introducing new products / services relative to competitors is very high	1	2	3	4	5	6	7

5. FIRM & RESPONDENT DETAILS:

Firm (or the Business Unit that your answers refer to) Details:

1	Name of the firm:	
2	Name of the business unit (if applicable):	
3	Primary business activity of the firm / business unit:	<input type="checkbox"/> Manufacturing <input type="checkbox"/> Services <input type="checkbox"/> Both
4	Is this business cyclical or counter-cyclical?	<input type="checkbox"/> Cyclical <input type="checkbox"/> Counter-cyclical <input type="checkbox"/> Non-cyclical
5	The firm / business unit's revenue mostly comes from:	<input type="checkbox"/> Business Customers <input type="checkbox"/> Individual Customers
6	Number of customers:	
7	Number of users per customer:	
8	Number of direct customer contacts handled (across all channels, on a daily basis):	
9	Number of direct customer inputs captured for further action (across all channels, on a daily basis):	
10	Number of indirect customer inputs scanned (across mediums, on a daily basis):	
11	Number of indirect customer inputs captured through these scans (across all mediums, on a daily basis):	
12	No. of years the firm / business unit has been in business for:	
13	No. of years the firm / business unit has been providing its current line-up of products / services for:	
14	Annual Revenue / Turnover (with currency code):	
15	Total Number of Employees:	

Respondent Details (If the survey was completed by many people, please provide details for each respondent on a separate sheet):

1	Job Title:	
2	No. of years at this firm:	
3	Name*:	
4	Phone Number*:	
5	Email Address*:	
6	Postal Address*:	
7	Can we contact you to follow up? *	<input type="checkbox"/> Yes <input type="checkbox"/> No
8	Can we send you survey findings? *	<input type="checkbox"/> Yes <input type="checkbox"/> No
9	Are you interested in receiving a benchmarking report for your firm? *	<input type="checkbox"/> Yes <input type="checkbox"/> No

* = Optional

End of the survey. Thank you for your participation!

Appendix: Scales:

- 1: Strongly Disagree, 2: Mostly Disagree, 3: Slightly Disagree, 4: Neither Agree Nor Disagree, 5: Slightly Agree, 6: Mostly Agree, 7: Strongly Agree
- 1: Rarely, 2: Quite Infrequently, 3: Infrequently, 4: Sometimes, 5: Often, 6: Quite Often, 7: Always
- 1: Worst, 2: Very Bad, 3: Below Average, 4: Average, 5: Above Average, 6: Very Good, 7: Best
- 1: Mostly Negative, 2: Mostly Negative With Some Positive, 3: More Negative Than Positive, 4: Some Positive, Some Negative, 5: More Positive Than Negative, 6: Mostly Positive With Some Negative, 7: Mostly Positive
- 1: Mostly Incremental, 2: Mostly Incremental With Some Radical, 3: More Incremental Than Radical, 4: Some Incremental, Some Radical, 5: More Radical Than Incremental, 6: Mostly Radical With Some Incremental, 7: Mostly Radical

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