CUSTOMER INDUCED UNCERTAINTY AND ITS IMPACT ON

ORGANIZATIONAL DESIGN

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How firms facing environmental uncertainty should organize their activities remains an important and challenging question for today's managers and organizational researchers. Proponents of contingency theory have argued that organizations must adjust their activities to fit the level of environmental uncertainty to ensure long-term survival.

Although much work has been done on contingency theory, it is clear that our understanding of uncertainty is far from complete. One important aspect of today's organizations is their focus on service, mass customization, and continuous innovation. This focus often results in the customer being brought either into the organization or at least into closer contact with it.

Even though the literature provides numerous evidences of the increasing customer focus, it is yet to empirically explain how the complications of customer-organizational interactions might create uncertainty for contemporary organizations. The traditional measure of uncertainty still considers customers as an environmental factor causing demand uncertainty while ignoring the complex nature of customer and organizational encounters.

Seeking to further refine the concept of uncertainty and focusing on the contemporary business phenomena, this study develops measures aspects of customer induced uncertainty and examines their relationships with three organizational design variables. Specifically, this study explains the complicated nature of customer -

organizational encounters that creates organizational uncertainty. Also, this study develops three operational measurement instruments for the three aspects of customer induced uncertainty. Finally, this study shows specific relationships between aspects of customer induced uncertainty and specific organizational design variables.

This study conducted a mail survey of middle level managers. With a sample size of 118 the measurement instruments were shown to have validity and reliability using factor analysis and Cronbach's alpha. Regression analyses indicate the presence of specific rather than general relationship between customer induced uncertainty variables and organizational design variables. Regression results suggested that the relationships between customer induced uncertainty variable and design variables were depended on the specific combination. For example, Customer acquisitiveness was negatively related to formalization where as Customer importance was positively related to professionalism. Results also suggested a possible positive relationship between decentralization and customer induced ambiguity.

Although not without limitations, this study improves our understanding of contemporary environmental uncertainty. Moreover, it provides preliminary measurement instruments of customer induced uncertainty variables for numerous future studies. Overall, this study is a preliminary step toward further understanding of the uncertainty-design contingencies of contemporary and future organizations.

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CHAPTER I

INTRODUCTION

Since the advent of systems theory (Bertalanffy, 1956; Boulding, 1966), the

environment has played a central role in the study of organizations. Within this work, a

key concern has been understanding the influence of environmental uncertainty on how a

firm is organized (Burns & Stalker, 1964; Dess & Beard,1984; Bluedorn,1993). It is

argued that the organization must be adjusted to fit the level of uncertainty produced by

the environment to ensure the long-term survival of the firm (Lawrence & Lorsch, 1967).

Much is known about the determinants of uncertainty and possible organizational

responses; however, it is not clear that our understanding has kept pace with the changes

faced by firms today. The later part of this century has been characterized by a rapid shift

in the United States from an industrial society to a post-industrial society, with its

emphasis on services (Naisbitt, 1982). Among the consequences of such a shift is a

significant alteration in the way that firms interact with customers. Where once the

organization could easily wall off much of itself from customer contact (Thompson,

1967), today's focus on service often results in the customer being brought either into the

firm itself or at least into closer contact with the firm.

The effect of such an increase in interaction with the customer has not yet become a focus of traditional work on environmental uncertainty. When considered at all, customers are generally thought of only in terms of demand. Results from studies within the emerging literature examining service organizations, however, suggest that customers are taking on an increasingly important role, and researchers have argued that customer induced uncertainty can in fact have an important influence on the way that a firm is structured (Jones, 1990; Chase, 1981; Chase & Tansik, 1983).

Given the increasingly blurry line between service and manufacturing organizations (Schmenner, 1995), placing the notion of customer induced uncertainty into the more general literature on environmental uncertainty becomes an important task. Accordingly, this study attempts to provide an understanding of a contemporary and important aspect of environmental uncertainty faced by firms. To do this, the nature of customer induced uncertainty and its role in determining appropriate organizational design are investigated. Specifically, an explanation as to how the increasingly important phenomenon of customer interaction creates uncertainty to organizations is provided. Three measurement instruments were developed to measure customer induced uncertainty variables and then, to show the usefulness of the construct "customer induced uncertainty", a framework borrowed from contingency theory is used to guide the discussion on customer induced uncertainty and organizational design relationship. The objective is to illustrate the general influence of customer induced uncertainty on organizational design.

Environmental Uncertainty and its Influence on Organizational Design

It is widely recognized that the environment has a clear impact on organizational activities. Therefore, understanding the organizational environment becomes an important task. This concept has been studied extensively, and it still remains a popular topic in the organizational theory literature. Despite extensive studies, however, our knowledge remains far from complete. While a few researchers have attempted to synthesize the various, often competing, approaches in the literature (Aldrich, 1979; Dess & Beard, 1984; Sharfman & Dean, 1991), a coherent and comprehensive conception and measure of the environment is yet to be developed.

In order to clearly understand environmental organizational uncertainty, researchers have sought to distinguish different aspects of uncertainty. Child (1972), for example, suggested dividing environmental uncertainty into frequency of change in the environment, degree of difference characterizing each change, and the degree of irregularity in the overall pattern of change. Duncan (1972), in the same year, presented an instrument to measure environmental uncertainty. Duncan's measure consists of two environmental dimensions: a stability-complexity dimension representing the number of factors taken into consideration in decision making and a static-dynamic dimension representing the degree to which these factors change over time. Although resources were not included in environmental measurement in the early seventies, with the advent of resource dependence theory (Pfeffer & Salancik, 1978) a third dimension, resource availability, has been added to the environmental measure. This dimension includes the

uncertainty caused by fluctuation of resource availability and the rate of competition in the organizational environment.

Seeking to further refine the concept of environmental uncertainty, more recent research has focused on the uncertainty arising from the task environment (Bluedorn, 1993). Task uncertainty is the uncertainty related to organizational decision making (Duncan, 1972; Sharfman & Dean,1991). Measurement of task uncertainty comprises three dimensions: complexity, dynamism, and munificence related to factors important for decision making (Dess & Beard, 1984). It is argued that these three dimensions adequately describe the state of an organizational environment, and that task uncertainty can be derived from these dimensions. Although this approach to uncertainty has received widespread recognition in the literature, the phrase may be a misnomer, since the environment does not possess the uncertainty. The uncertainty is in managers' perceptions and their abilities to predict the future state of the environment (Bluedorn, 1993). Therefore, in order to understand environmental influence on organizational activities, the knowledge of managers' perceptions of their task uncertainty may also be important. Based on their perceptions of uncertainties faced by organizations, managers respond with appropriate organizational activities. This concept of appropriate organizational response to differing environmental conditions, presented in figure 1 below, is the basis of contingency theory.

| Environment | $\longrightarrow$ | Organizational Response |
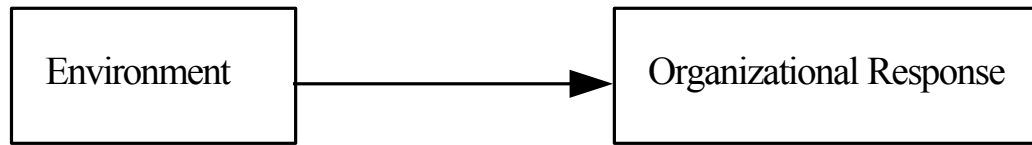
Figure 1. Environment and Organizational Response Contingency

Contingency theory is based on the open system perspective that grew in response to the perceived need for a theory to conceptualize organization and environment relationships (Fig. 1). Prominent concepts in contingency theory include: there is not a single best way to organize, all ways of organizing are not equally effective, and the best way to organize depends on the nature of the organizational environment (Lawrence & Lorsch, 1967). It is argued in contingency theory that the environment, including rapid rates of change in market conditions and technology, presents both opportunities and threats to an organization.

In general, contingency theory proposes that the actions of an organization will vary depending upon the nature of the environment it faces. Organizations act to remain in existence in different environmental conditions, with responses intended to fit the environment. One such response is to design the organization so that it fits the environmental requirement. Consequently, a major part of contingency theory focuses on the relationship between the environment and organizational design. It is suggested that environmental conditions demand specific design characteristics for high performance.

Within such contingency theory focus, one popular research area has been an examination of the external environmental uncertainty and organizational design and structure relationship. A common theme that appears in these studies is that the more uncertainty faced by an organization, the more will be the requirement for an adaptable and responsive structure. Organic and mechanistic structures, for example, have been proposed to be associated with high and low environmental uncertainty respectively (Burns & Stalker, 1961). High and low information processing have been associated with high and low task uncertainty (Galbraith, 1974) and programmed and non-programmed organizational coordination have been associated with low and high input uncertainty respectively (Argote, 1982). There are many other similar examples of structure and environmental relationships.

The usefulness of the results of these contingency relationships, however, depend on our ability to capture the nature of the uncertainty faced by organizations in today's economy. A thorough examination of today's business phenomenon will reveal that customers are playing an increasingly important role in determining organizational environmental uncertainty. However, as argued above, a coherent and comprehensive conceptualization of the environment is yet to be developed. Furthermore, most uncertainty measures are broad and focus on factors that affect a group of organizations as a whole. As a result, the involvement of customers in the creation of uncertainty has not been given its fair share of attention in the environmental contingency literature. While an occasional item regarding customers is found in uncertainty measures, these most often

have referred to the broad level of demand fluctuations caused by customers. It can be contended that such measures do not adequately capture the potentially substantial uncertainty arising from transaction specific customer involvement.

This omission of the customer is understandable given the economy during the 60s and 70s when most organizations were goods producing and service was not considered a high priority. In today's environment, however, it is obvious that customer involvement cannot be ignored. The service sector of the American economy, including wholesalers and retailers, currently provides 73 percent of the national employment (Bureau of Labor Statistics, 1997). In such organizations, the level of customer involvement and the uncertainty associated with it are likely to be important.

In addition, though, almost all manufacturing organizations now focus to at least some degree on providing high-level customer service in conjunction with their products. With the advent of the global economy, U.S. manufacturers are feeling the pressure of increased competition. It has been proposed that U.S. manufacturing organizations should respond by competing not only with products but also with associated services (Peters & Austin, 1987). Mass customization and flexible manufacturing system technologies recently introduced by manufacturing organizations are efforts to improve customer involvement and provide better service in association with goods. Such efforts suggest that manufacturing organizations, like their service counterparts, now need to account for increasing customer involvement.

This blurring of the line between service and manufacturing led Schmenner (1995) to suggest that organizations can no longer be categorized with clarity as agriculture, manufacturing or service. Many organizations produce both service and goods. As a consequence, several researchers have suggested the presence of a continuum of organizations with pure service and pure manufacturing at the two extremes (Armistead & Clark, 1991; Coffey & Bailly, 1991; Murray & Schlacter, 1990). It is proposed that merchandise and the support provided by organizations forms a product-service package that requires both product and service strategies (Armistead & Clark, 1991). It is also recognized that with the development of flexible manufacturing systems, the modern economy can be considered as having producers of goods and services (Coffey & Bailly, 1991). In the current American economy, then, most organizations will arguably fall somewhere in the continuum between pure service and pure manufacturing. As such, the effects of service elements are increasingly becoming important for all organizations.

With the increased focus on customers and their interaction with the organization, the transaction specific activities brought in by customers become important and need to be examined carefully. Therefore, examining transaction specific uncertainty that may be created by the customers' involvement becomes an important undertaking and should be included in order to understand current uncertainty-design relationships.

Purpose and Contribution

Given the increased attention on customers in practice, organizational scholars have started writing about the importance of customers in organizational activities. Although the importance of customers has been recognized in many disciplines of management, the bulk of the research has been done in literature based on service operations. Therefore, one would expect to see significant ongoing efforts to examine the nature of customers' involvement and their relationships with organizational activities. Yet, despite the enormous importance and timeliness of the topic, there is hardly any effort from an organizational theory perspective to understand and examine various implication of customers involvement in organizational activities. Thus, the overarching purpose of this study is to understand and clarify implications of customer orientation, and thereby customer involvement, in organizations in general. To accomplish this general purpose, three specific purposes had to be accomplished:

1.   Explain how customer interactions create uncertainty to the organizations.

2.   Develop and operationalize customer induced uncertainty.

3.   Test its relationships with variables related to organizational design.

With the customer being an increasingly important player in organizational activities, clarifying and operationalizing customer induced uncertainty improve our understanding of the implication of customers' involvement in today's organizations. It is essential for the growth of any academic field that the important variables be defined clearly and amended for measurement (Kellogg & Chase, 1995). This study provides an

improved understanding of customer induced uncertainty and its relationships with structural variables. The model provides a guideline to understand customer induced uncertainty and its implications in organizations in general, thus helping to break down the so called service versus manufacturing dichotomy.

This study identifies the lack of an increasingly important organizational phenomenon, namely "customer involvement", in the traditional environmental literature. Given this lack, and its importance, studies attempting to broaden our understanding of this phenomenon and its implications on organizational activities become an important undertaking. As mentioned earlier, customer induced uncertainty is a direct byproduct of the increasing customer involvement in today's organizations. Therefore, this study attempts to perform the above mentioned tasks by focusing on the concept of "customer induced uncertainty."

To begin with, it is important that we clearly understand this concept and how this particular type of uncertainty develops in an organization. To do this, it is necessary to explain how the increasing customer involvement creates customer induced uncertainty in an organization. The logical next step would be to further develop the concept with clear definitions. A major achievement in defining customer induced uncertainty would be the operationalization of the concept.

For clarity of definition, explanation of any concept must include its operationalization. Operationalization of the concept would provide us not only with an overall understanding, but with a detailed understanding of elements that make up

customer induced uncertainty. Furthermore, a comprehensive understanding of a concept should include an explanation of its influence on other variables. Therefore, for a comprehensive understanding, operationalization of customer induced uncertainty should be followed by testing its relationship with important organizational variables. To do so, this study not only operationalizes the construct of customer induced uncertainty, it also examines effects of customer induced uncertainty on important organizational design variables.

Clarifying and further developing the concept of customer induced uncertainty by operationalizing it is a major contribution to the existing organizational theory literature. Also, operationalization provides an instrument of customer induced uncertainty to measure its implications on other organizational variables. Specifically, this study examines the relationships between uncertainties induced by customers and organizational design variables. Given the importance of relationships between uncertainty and organizational design variables in the organizational theory literature and the increasing importance of customer induced uncertainty in all kinds of organizations, this study is an useful contribution to the existing literature.

Besides enriching the contingency theory literature, this study is a major contribution to the practitioners of management. Given the growing importance of customers in contemporary businesses, today's managers are in constant pursuit of understanding the nature of customer encounters. This study not only tries to explain the

nature of customer encounters, but it also sheds some light at some probable ways to organize to manage these encounters.

Overview

This important study proceeds in the following manner. The next chapter provides a literature review and general framework for understanding the nature of environmental uncertainty and its influence on organizational design variables. Within the general framework, understanding the nature of customer induced uncertainty is the focus. A thorough examination of the nature of customer induced uncertainty and its effects on organizational design variables is performed.

The review starts with an analysis of the organizational environment and uncertainty literature. Following this is a detailed discussion of the importance of customers in the contemporary organizational environment. Included in that discussion is the nature of customers' involvement and the analysis of how customer and organizational interactions create uncertainty. From an extensive literature review, the study develops a distinct measurable construct - customer induced uncertainty. Following this, contingency theory is introduced. Specifically, environmental uncertainty and organizational design relationships are demonstrated.

After providing the theoretical framework on the uncertainty/organizational design relationship, specific relationships between customer induced uncertainty and organizational design variables are explored. By doing so, a thorough conceptual

explanation and the development of a reliable and valid measurement instrument of an important construct - customer induced uncertainty - are accomplished. Furthermore, the illustration of the usefulness of this measure is also accomplished. After presenting both theoretical and empirical foundations relating to customer induced uncertainty and its possible influence on organizational design, specific testable hypotheses regarding the measure itself and its relationship with design are presented.

After the specification of hypotheses, Chapter 3 provides the methodology for testing them. Based on the theoretical development of customer induced uncertainty, items are generated for measuring all three of its constructs. Besides the measurement instrument development, this chapter provides plans for data collection and sampling design.

Chapter 4 provides findings of the study. Findings are analyzed based on their conformity with the stated hypothesis. All the Deviations are analyzed to provided explanations. Chapter 5 provides conclusion and implications.

Summary

The ever-changing organizational environment creates the need for continuous adjustment of our approaches to understand organizational activities. Major theories, such as contingency theory, even though they are relevant today, may need adjustment for reliable prediction of specific organizational phenomena. This study, with a general model and specific propositions, represents an important step toward providing theoretical and

empirical guidelines for researchers to better understand contemporary organizational phenomena. Specifically this study explains and develops the construct for customer induced uncertainty, then demonstrates the usefulness of the concept by examining its effects on organizational design variables.

CHAPTER II

THEORETICAL FOUNDATION

Based on an extensive literature review, this chapter explains the current state of

our knowledge of the organizational environment. Within the environmental research, an

important concept is environmental uncertainty. Our understanding of environmental

uncertainty and its influence on organizational activities are then explored. It is

increasingly clear that the customer is one of the important components of the task

environment. The importance of customers and the contemporary nature of their

involvement is discussed next in this chapter. This is followed by an introduction and

explanation of the concept "customer induced uncertainty." Finally, several hypotheses are

developed to test the influence of customer induced uncertainty on appropriate

organizational design variables.

Environment and Organization

It is well recognized in the organizational theory literature that understanding the

organizational environment is very important for all organizations. Numerous researchers

have proposed that the environment has a clear impact on organizational activities.

According to Bourgeois (1980), the environment is generally investigated using three

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different perspectives: objectives regarding external relationships (customers, suppliers,
competitors, and regulatory groups), external attributes (complexity or heterogeneity and
turbulence or volatility), and internal perceptions (perceptions of managers regarding
environmental uncertainty).

Environmental influence on organizational activities has also been studied using
several other perspectives: rate of change in the environment (Burns & Stalker, 1965),
uncertainty of environment (Lawrence & Lorsch, 1967), and manageability of task (Mohr,
1971). Despite extensive studies of organizational environment, however, our knowledge
in this field remains far from complete. According to environmental researchers,
approaches to conceptualizing and measuring the environment have not received
widespread acceptance (Sharfman & Dean, 1991).

Conceptual understanding of environmental effects on organizational activities,
however, has been a popular interest in the organizational theory literature. According to
some, the environment can be regarded as the set of all those objects, a change in whose
attributes may influence the organization and visa versa (Hall & Fagen, 1956). Depending
on proximity to the organizational decision making, the objects are grouped into two
layers, general environment and task environment. General environment consists of a set
of broad factors external to organizations that creates the overall context. Usually these
factors include political and legal forces, socio-cultural forces, technological forces,
economic forces, etc. Task environment, on the other hand, consists of forces that closely
affect a specific organization in its decision making. Usually these factors include

competitors, customers, suppliers, strategic allies etc. Depending on the type of

organization, however, the factors that make up general and task environment may vary.

Between task and general environments, most research is focused on the task

environment (Thompson, 1967, Aldrich, 1979; Randolph & Dess, 1984; Dess & Beard,

1984; Sharfman & Dean, 1991). The influence of the task environment is generally

examined by environmental contingency models (Burns & Stalker, 1961; Lawrence &

Lorsch, 1967). According to Argote (1982), however, the distinction between the

concepts of general environment and task related environment is somewhat artificial.

Uncertainty faced by organizational decision makers may come from both the

environmental dimensions. Furthermore, she contends that in order to clearly understand

the environmental uncertainty and organizational activity relationship, we must study

specific factors of uncertainty and how those specific factors influence organizational

activities. With the introduction of input uncertainty, she proposed to bridge the gap

between general and task environmental uncertainty. According to her, to clearly

understand environmental uncertainty and its influence on organizational decision making,

studying relevant and specific sources of uncertainty is important.

Environmental Uncertainty

In cybernetics theory and information theory, task uncertainty is expressed as the

difficulty of making decisions or choosing the proper information in a given situation

based on the number of information cues and the similarities between them. The degree of

uncertainty is highest when it is most difficult to disentangle information cues in a given

situation. This difficulty is highest when there are many information cues that are

apparently very similar to one another. This focus is reflected in the broader literature on

uncertainty.

According to Child (1972), for example, environmental uncertainty can be divided

into frequency of change in the environment, the degree of difference characterizing each

change, and the degree of irregularity in the overall pattern of change. Duncan, in the same

year, presented an instrument to measure environmental uncertainty. Although Duncan

developed a measure of perceived environmental uncertainty, his instrument is widely used

in measuring task uncertainty. Duncan's (1972) measure consists of environmental

stability and complexity, representing the degree of environmental change, and the degree

of environmental heterogeneity respectively.

There are, however, several dimensions that have been proposed by organizational

scholars that can make up task uncertainty. Many of these dimensions were used popularly

used in organizational studies. Without claiming comprehensiveness, Table 1 provides a

list of a few well accepted dimensions of uncertainty with their corresponding

descriptions.

Identification of environmental dimensions at this broad level is worthwhile in

comprehending the existing knowledge (Scott, 1992). Literary works in this area continue

to advance with a focus on determining the primary dimensions of environment (Sharfman

& Dean, 1991). It is apparent from the dimensions presented in Table 1 that uncertainty in

Table 1. Important Uncertainty Dimensions

No	Source	Dimension	Description
1	*Dill, 1958*	*Degree of homogeneity-heterogeneity*	The extent to which the task environmental factors are similar or dissimilar. Other labels used for the same concepts are complexity, diversity etc.
2	*Burns & Stalker, 1961; Lawrence & Lorsch, 1967; Child, 1972.*	*Degree of stability-variability*	The extent to which the task environmental factors are undergoing change. Other labels used for the same concepts are fluctuation, dynamism etc.
3	*Perrow, 1967*	*Exceptions and search procedures*	Degree of variability of procedures and degree of analyzability of problems.
4	*Mohr, 1971*	*Manageability of task*	The degree of complexity of individual task performed by individual employee.
5	*Duncan, 1972*	*Complexity*	Number and heterogeneity of environmental factors
6	*Galbraith, 1973*	*Lack of information*	The lack of information may hurt organizational ability to predict the future state of the organizational task environment.
7	*Pfeffer & Salancik, 1978*	*Degree of interconnectednes s-isolation*	The extent to which the organization is connected with factors of its task environment, as any action by a factor would influence the organization.
8	*Pfeffer & Salancik, 1978*	*Degree of munificence-scarcity*	The extent to which the organization is dependent on resources of its task environment.
9	*McKelvey, 1982*	*Degree of threat-security*	The extent to which the organization is vulnerable to its environment. In other words, how strong the impact of the environment in case of an error committed by the organization.

 general poses challenges to organizational decision makers. Two major themes of uncertainty appear from the above table, the ease of understanding the environment and the predictability of the environment. Dimensions such as *degree of homogeneity-heterogeneity*, *search procedures*, *manageability of task*, *complexity*, *lack of information*, *degree of interconnectedness-isolation*, and *degree of munificence-scarcity,* focus on ease of understanding the environment. In contrast, dimensions such as, *degree of stability-variability*, *exceptions*, and *degree of threat-security* focus on predictability of the environment.

Dimensions that focus on ease of understanding the environment capture a number of environmental factors, variability of these factors, complexity of relationships among these factors, lack of information on these factors, difficulty of analysis to the environmental problems and complexity of response to the environment. Increases in all the above characteristics will make it harder for the organizational members to understand the environment and its consequences. Similarly, dimensions that focus on predictability of the environment capture frequency of change and degree of change. Increases in these characteristics will make it harder for the organizational members to predict future environmental conditions.

Although the above environmental dimensions remain more or less the principal way to describe overall environmental properties, the concept of uncertainty itself is undergoing changes. For example, the uncertainty concept is elaborated by many researchers (Milliken, 1987; Gerloff, Muir, & Bodensteiner, 1991). These authors extend

Duncan's (1972) measure of environmental stability and complexity into three dimensions of perceived environmental uncertainty: state, effect, and response uncertainty. As most earlier studies measured environmental properties using managers' perceptions, Dess and Beard (1984) tried to develop multidimensional objective measures of the environment. In 1991, Sharfman and Dean modified Dess and Beard's measures and came up with a multi dimensional measure that they believe is more accurate. The popularity and the variety of dimensions used to conceptualize the external environment suggest that our understanding of the concept of environmental uncertainty is still not complete, but continuously undergoing change (Bluedorn, 1993).

Amidst this continuous evolution of our understanding of uncertainty, a common theme that appears in the usually inconsistent conceptualization of uncertainty is the difficulty in predicting the future states of many factors associated with organizational tasks. The factors that make up the task environment may vary from organization to organization. A few important factors that make up task environment of most organizations are resources, customers, competitors and suppliers. Other broad factors, such as technology, governmental regulation, societal, political, and general economic factors, make up the overall situation of organizations and are known as general environmental factors. However, these factors might affect organizations differently based on the type of organizational activities undertaken. For example, while government regulation is a very important component of the task environment of a law firm, it is not as important a consideration for usual decision making in a car wash or a laundry. Therefore,

components that make up the general environment and task environment might vary depending on the type of organization.

Once we identify the components of the environment that directly influence the task related decision making of a particular organization, it is important to gather relevant information on each factor to be able to predict the future state of the organizational task environment. The lack of information might hurt our ability to predict the future state of the organizational task environment and the inability to predict the future state of task environment is represented as task uncertainty (Galbriath, 1973). Along the same line, Lysonski, Levas, and Lavenka (1995) proposed that task uncertainty can be defined as the unpredictability arising from ambiguous information regarding important factors that constitute the task environment.

Given the above, trying to understand major components of uncertainty that have contemporary importance is a logical approach. It has been contended in the literature that understanding and classifying individual factors that make up uncertainty are valuable additions to the existing uncertainty literature. In other words, our understanding of individual components of uncertainty needs to be broadened, especially those areas that have contemporary importance. It is also important to understand how those components might influence different organizational activities.

For example, one important reason cited for the increase in the level of uncertainty in the organizational task environment during the 1990's is the increasing importance and unpredictability of certain environmental factors. Among them, a rapid technological

advancement is cited as an important and recent phenomenon both in the popular press and academic journals. Researchers propose that this rapid advancement in technology, while beneficial in many respects, also creates uncertainty in the organizational task environment (Burgelman & Grove, 1996; Hillman, & Schwartz, 1993).

Consequently, technological uncertainty has become a popular area of research (Tushman & Anderson, 1986; Moriarty & Kosnik, 1989; Burgelman & Grove, 1996; Malone, Morton, & Halperin, 1996; Teplensky, Kimberly, Hillman, & Schwartz, 1993; Shenhar, 1991; Howarth, 1991). Organizational scholars not only are trying to explain the particular type of uncertainty stemming from technology, but they are also trying to explain the relationships of the technological uncertainty with various organizational activities. These explanations, besides advancing the literature on environmental uncertainty, provide understanding of more appropriate organizational activities.

However, rapid technological advancement is not the only environmental factor that is increasingly becoming important and unpredictable. Increasing customer involvement is another equally important environmental factor influencing contemporary organizational activities. Tremendous growth of the service sector in the US economy (Contractor & Kundu, 1995), the increasing customer orientation of manufacturing organizations (Schuler & Harris, 1992) and competition based on customer service (Chase & Garvin, 1989) in the contemporary business environment makes customer a considerable factor for evaluating task uncertainty. Accordingly, with this new practice of increasingly close encounters between customers and organizations,

unpredictability may arise in organizational decision making. Organizations must understand the type of encounters and the amount and type of uncertainty brought in by these ambiguous encounters. A clear understanding of this important factor could help organizations take appropriate actions.

<div align="center">Importance of Customers in Existing Organizational Literature</div>

In the contemporary business world, customers are becoming a more and more integral part of business operations. This important development and its impact in the organizational phenomena have been recognized in academic journals as well as in practice. Customer orientation is not only important, but in many cases it is becoming necessary for the survival of organizations. The meaning of customer orientation is becoming increasingly comprehensive and complex in current business activities. A continuous communication flow between customers and organizations is necessary for customer orientation. Schuler and Harris (1992) proposed that organizations should consider customers as external employees and treat them as partners for success. While most strongly emphasized in the literature on service organizations, it is also recognized that to be successful, manufacturing organizations need to involve customers. Chase and Garvin (1989) proposed that future successful manufacturing organizations will have direct and continuous contact between customers and production processes.

In practice, many innovations in technology and/or organizational activities suggest the increasing importance of customers. Many organizations have direct contacts

between customers and their core activities. According to a report by Lawler, Mohrman and Ledford (1992), in at least one forth of the Fortune 1000 companies, 50% or more of the employees are in direct contact with customers. This importance of customers in organizational activities obviously complicates organizational decision making. Arguably, these complications will add to the organizational task uncertainty, and it is reasonable to assume that a significant part of the contemporary task uncertainty is made up of customer induced uncertainty. As such, it is also important to understand its influence on organizational activities. In order to do this meaningfully, it is important to capture the uncertainty induced by complicated customer involvement in organizations.

A review of the literature on the environment indicates that although the bulk of the research recognizes that customers are a component of the organizational environment, their role in determining environmental uncertainty remains largely unexplored. Many of the uncertainty measures include customers, but all of them try to measure the customer driven uncertainty that in essence causes demand uncertainty (See Table 2). In most cases, these measures are worded either directly to capture demand fluctuation or indirectly to capture demand fluctuation by capturing the amount of change in customers' taste and/or amount of variety in customers' demand. Thus, most of existing uncertainty measures that include customer dimensions are capturing the customer demand uncertainty. A few such works in the field of organizational theory and policy that looked at customers role in organizational environment, however, call for attention.

Table 2. Role of Customers in the Traditional Concepts of Environmental Uncertainty

Author and Year	Concept	Customer's role
Duncan (1972)	Uncertainty	Managers' perception of demand fluctuations caused by customers.
Porter (1980)	Buyers power	High bargaining power of customers might cause lower organizational control over customer demand.
Argote (1982)	Input uncertainty	Variety of customers causes unpredictable demand.

It is important here to cite a few researchers of organizational theory such as Duncan (1972), Porter (1980), and Argot (1982) that have incorporated customer in their in various concepts of uncertainty (table 2). A simple discussion of each of these concepts makes it clear that none of these are designed to capture the complicated nature of customer orientation of the current environment.

Duncan (1972) measured managers' perceptions of the degree of change in customers and their perception of the extent of the variety of customers. These two dimensions are used to capture the perceived dynamism and complexity of the task environment caused by customers. However, a further analysis of these two dimensions gives us a clearer picture of what they are capable of measuring. When we are measuring the degree of change in customer base, ultimately we are determining the potential degree of change in customer demand. Similarly, when we are measuring the extent of the variety of customers, we are measuring the level of difficulty of predicting customer demand.

Hence, these perception measures are likely to capture mostly the demand fluctuation caused by customers.

According to Porter (1980), bargaining power of buyers influences the industry attractiveness. High buyer power will adversely affect the industry attractiveness. Buyer power is determined by the concentration of buyers, buyers' switching cost, etc. As industry is closely related to the task environment of an organization, conceptually one can argue that if buyers have high bargaining power it will be harder for the organizations to control buyers demand. Consequently, the task environment will be harder to predict by the organization.

Drawing concepts from cybernetics and information theory, Argote (1982) developed a measure of input uncertainty. In her study, Argote used the overall composition of patient inputs (number of patients in various conditions) as a measure of input uncertainty. According to her measure, if there are many alternatives of patient inputs and each alternative is equally likely to occur, then there is a high input uncertainty and visa versa. This is because the predictability of the patient's condition decreases as the organization focuses on an increasing number of patient conditions and none of these conditions can be identified as a majority occurrence. Therefore, this measure also captures the unpredictability of demand.

Summary

The above discussion leads to a conclusion that our understanding of the organizational environment is far from complete. As the importance of individual factors

determining uncertainty undergo change, our understanding of the environment needs to be updated continuously. Based on the contemporary business phenomena, it is important to broaden our understanding of the impact of customers in creating environmental uncertainty and its influence on business activities. It is clear that customer involvement is increasingly becoming important and widespread in contemporary organizations. Moreover, the complexity and ambiguity faced by organizations due to increasing customer interaction has not been captured by the traditional measure of environmental uncertainty. Therefore, recognizing a clear need for focusing our attention to the uncertainty that might be caused by increased customer involvement, one must first understand the complex nature of contemporary customer involvement in organizational phenomenon

<div align="center">Customers Involvement</div>

As customers are playing an increasingly important role in both manufacturing and service organizations, achievement of quality and competitive advantage requires a firm to become customer oriented. According to Dean and Bowen (1994), customer orientation means providing products and services that fulfill customer needs. Schnider and Bowen (1995) argued that customer orientation is increasingly becoming more comprehensive and complex. According to these authors, customer orientation means customers and firms share interdependencies, values, and strategies over a long term by fostering direct customer contact and information flow between them.

Although it is being emphasized more in recent organizational research, the concept, *customer orientation,* is not a brand new one. According to Levitt (1960), customer satisfaction is the ultimate goal of any business. The same notion has been proposed in the quality management literature (Garvin, 1988; Juran 1988; Deming, 1986). Quality means delighting customers rather than simply meeting their needs (Legnick-Hall, 1996).

Emphasis on the importance of customers has been wide spread in a variety of business related fields. Mills (1986) emphasized the importance of customers from the organizational theory perspective. Similarly, many other researchers have emphasized customer importance from various other perspectives. Chase (1978) emphasized it from the operations management perspective, Ulrich (1989) from a strategic management perspective, and Gronroos (1995) from a marketing perspective. Schuler and Harris (1991) emphasized that firms should consider customers as partners for their success. They should treat customers as though they are the external employees.

Although customer involvement is mainly studied in service organizations, the importance of customer involvement in manufacturing organizations is gaining widespread importance. Chase and Garvin (1989) proposed that manufacturers will succeed in the next generation by incorporating service with products and by anticipating and responding to a comprehensive range of customer needs. Researchers speculate that in successful organizations of the future, production workers and factory managers will be in direct and on going contact with customers. Service is an important competitive weapon for global

manufacturers. It is well recognized that in order to succeed in the global market U. S. manufacturers may have to compete based on associated service.

The increasing importance of customers in business settings is evidenced by many changes in organizational activities. Many firms have erased buffers between their core activities and customers. Increasing numbers of organizations have high a proportion of employees that are in direct contact with customers. Numerous firms have started incorporating customer satisfaction as a primary goal in their mission statement (Grant, Shani, & Krishnan, 1994). Awards based on organizational assessments like the Malcom Baldridge awards rely on criteria emphasizing customer satisfaction. According to Marshall and Yorks (1994), customer sophistication and knowledge are increasing. Subsequently, their expectations are also increasing. This rise in customer sophistication and expectation has to be matched by firms in order to succeed in today's market place. Ring and Van de ven (1992) suggest ties with customers based on trust and respect in order to understand customer expectations.

Although gains have been made in recognizing customers importance to organizational success, important challenges remain for understanding the results of the increasing customer importance, and, consequently, managing the increasing customer involvement. Customers, when included in the organizational system, induce uncertainty in the transformation process (Thompson, 1967). It has been contended that organizations can deal with this type of uncertainty simply by sealing off their technical core from the customers. However, contemporary business practices increasingly require customers to be an integral part of organizations. Customer orientation and high customer involvement

became the name of the contemporary competitive game. Therefore, although by sealing off the technical core organizations may try to eliminate customer induced uncertainty and improve productivity (Thompson, 1967; Chase, 1978), the lack of customers in the organizational process will adversely affect its customer orientation and ultimately the competitive advantage. Thus, sealing off customers and ignoring uncertainty induced by them is no longer a viable business decision. As customer involvement is continuously growing in virtually all organizations, customer induced uncertainty is becoming increasingly prominent. Working closely with customers might induce uncertainty in organizational task environment. However, the degree of customer induced uncertainty would vary from organization to organization based on the type and extent of customer involvement. And based on the degree of this uncertainty, successful organizations would adjust their activities.

Tansik (1990) proposed that many successful organizations find it beneficial to involve customers in the organizational process. According to Mills and Moberg (1982), sealing off the technical core diminishes the quality of the service provided by the organization. Further, it becomes increasingly difficult as the organization continues to increase customer orientation. Lovelock and Young (1979) recognized the importance of increased customer participation. Among their suggestions is involving customers in the transformation process by treating them as "partial employees." It is clear from the above discussion that many researchers believe that, in an environment where customer participation is very important for all organizations, sealing off customers from the production process would not be a good idea for productivity improvement.

With customers becoming more and more an integral part of organizations, organizations are having an increasingly difficult time managing them as inputs in the transformation process. According to van Dierdonck and Brandt (1988), one of the basic requirement for the survival of an organization is that it must make sure that it has the right inputs. Management usually has much more control over raw materials as inputs than over the incoming customers as inputs. Needs and actions of customers are always somewhat different. Also, during their interactions with organizational employees, mutual influencing takes place. This essential but difficult to manage input creates work-flow uncertainty (Mills & Moberg, 1982).

The above discussion highlights the increasing involvement of customers within both manufacturing and service organizations. Customers, with their increasing involvement, cause work-flow uncertainty, which is regarded as *customer induced uncertainty*. The above discussion also makes a case for including the customer induced uncertainty more directly within traditional contingency models relating organizations and their environment. To do so, however, a clear understanding of the nature of uncertainty arising from customer involvement is needed. As well, consideration must be given as to how uncertainty arising from customer involvement might relate to organizational activities such as organizational design. Each of these is discussed in turn below.

Customer Induced Uncertainty

It is clear that the amount of customer induced uncertainty encountered by an organization can be enormous depending on the degree and type of customer involvement.

Furthermore, as we have seen a steady increase in the trend of customer involvement not only in service organizations but also in manufacturing organizations, it is becoming necessary to study a detailed customer induced uncertainty variables besides the broad environmental uncertainty measure.

The amount of uncertainty caused by customer involvement is likely to depend on a number of factors. At the simplest level, uncertainty will change with the degree of customer involvement with the organization. Mere passive contact may create uncertainty due to the possibility that the customers' perception regarding the organization may change simply by his/her presence in the organizational facility, but such influences would not be expected to be particularly strong. Active participation, though, especially when customers actively participate in the completion of a transaction, could be expected to have a much higher impact on uncertainty. Assuming that customer involvement increases with increases in the service element in the organization, then one could argue that transaction specific customer induced uncertainty is directly proportional to the amount of service elements in the organization.

Such an argument, however, is likely to be too simplistic. Customer and organizational transactions occur in virtually all organizations. Trends in manufacturing organizations show an increasing level of such transactions. More and more manufacturing organizations are starting to compete based on customer service in addition to their products. Communication flow between customers and manufacturing organization has taken a new height. In their pursuit to better understand customer preference and provide customized products, today's manufacturing organizations are interacting with customers

more than ever before. Therefore, based on the extent and type of these interactions,

manufacturing organizations are exposed to at least some degree of customer induced

uncertainty.

Research on service organizations has demonstrated that service encounters can

vary along a number of dimensions and that these variations can have important

implications for the degree of uncertainty arising from the interaction between the

customer and the organization. Factors such as the duration of customer contact,

customer participation in the transformation process, customer employee exchange, and

value of the transaction each have differing potential for creating uncertainty. While this

literature has primarily focused on service organizations and mostly overlooked the role of

service in manufacturing organizations (Bowen, Siehl & Schneider, 1989), it does provide

insight into the nature and development of customer induced uncertainty.

It is clear from the service literature that customer induced uncertainty is too

complex a construct to be measured by one simple perceptual question, as has been tried

in environment research in general. During a transaction, or even a simple encounter

between the customer and the organization, the customer can be either a passive recipient

or an active participant. The complexity of a given encounter increases with the increase in

the involvement of customers (Chase & Tansic, 1983). Several authors (Bowen, 1986;

Larsson & Bowen, 1989; Gronroos, 1990; Jones, 1990) have noted that customer's

willingness to participate in a service creation process varies from low to high. The

participating customers' activities are hard to predict and control by organizations.

Further, as the tangibility of the output decreases, the measurement of the quality of the

output becomes increasingly difficult. Consequently, quality measures depend more and more on customers' perceptions (Parasuraman, Berry & Zaithamal, 1985). Perception measures are not objective and are therefore difficult to rely on, so as the organizations' dependence on perception measures increases so does the uncertainty faced by the organization.

Uncertainty to the organization might also arise from the nature of the customer-organization exchange. During the exchange, for a successful accomplishment of a transaction, a customer may or may not participate actively. In a passive customer participation, customer's perception of the exchange and the context of the exchange is important to the organization. Since it is difficult for organizations to assess perception, passive customer participation could contribute to uncertainty. In an active customer participation, however, both mental and physical labor of customers can be utilized. It is suggested that these exchanges are very uncertain when the amount of information needed to complete the transaction becomes very high (Schneider & Bowen, 1985). Therefore, in addition to customer perceptions, uncertainty created by customer-organization exchanges is determined by the amount of information needed to complete such interactions.

From a transaction cost perspective, Bowen and Jones (1986) described the presence of performance ambiguity and role conflict in the customer-organization transaction process. In addition, Jones (1990) explains the presence of asset specificity of the transaction and how that complicates the transaction process. Performance ambiguity refers to the difficulty in evaluating performance, whereas role conflict refers to opportunistic behavior based on the expectation that the result of competitive behavior

would be better than cooperative behavior. Asset specificity refers to the assets specific to the transaction. As the amount of non transferable assets specific to a transaction increases, the uncertainty of the transaction also increases. The intangibility of an employee-customer encounter makes it difficult to establish cause-effect relationships for the creation and quality of outputs . As the number and complexity of such encounters (transactions) in an organization increases, the performance ambiguity faced by the organization also increases. Consequently, according to the existing literature on service operations, as the perception of role conflict, performance ambiguity, and asset specificity of an organization-customer transaction increases, uncertainty of the transaction also increases.

The above discussion highlights probable explanations of organizational uncertainty that comes from its customers. However, to clearly understand the nature of uncertainty induced by customers and to be able to test influence on organizational activities, a comprehensive analysis of the concept is necessary. The following sections develop a comprehensive framework for understanding the concept *customer induced uncertainty*.

Types of Customer Induced Uncertainty

At the simplest level, customer induced uncertainty means organizational task uncertainty that is induced by customers as they passively and actively interact with the organization. A large volume of research on customer-organization interaction is available in the literature on service operations. Among the concepts developed there, the closest to

customer induced uncertainty is the concept of transaction specific uncertainty. Although this concept is pertinent in this discussion, there are fundamental differences between transaction specific uncertainty and customer induced uncertainty that should be considered.

Transaction specific uncertainty measures both the uncertainty to the organization and the uncertainty of the customer involved in a transaction. Customer induced uncertainty, on the other hand, focuses on the organizational task uncertainty arising from the organizations interactions with customers. As it involves a part of organizational task uncertainty that is induced by customers, customer induced uncertainty has an organizational level unit of analysis. Conversely, transaction specific uncertainty's unit of analysis is a transaction. Further, rather than measuring costs of individual transactions, customer induced uncertainty measures organizational perceptions of uncertainty induced by its overall customer base. Customer induced uncertainty, unlike transaction specific uncertainty, does not always require active transactions between customers and the organization. It can be generated by mere passive interactions. Finally, according to transaction cost economics, which is the basis of transaction specific uncertainty, the organizational response to transaction costs is to either internalize or externalize transactions, whereas organizational response to customer induced uncertainty is to adjust internal structure.

Nonetheless, the notion of transaction specific uncertainty is helpful. Drawing heavily from this concept, as well as other concepts in the existing literature on service operations such as customer involvement and customer contact, and focusing on

difference between transaction specific uncertainty and customer induced uncertainty,

three types of customer induced uncertainty can be developed. Each of these three types,

customer induced ambiguity, customer importance, and customer acquisitiveness, is

discussed in the following sections.

 Customer Induced Ambiguity. In the service literature, performance ambiguity is

recognized as one of the dimensions of transaction specific uncertainty (Jones, 1990;

Bowen & Jones, 1986). Performance ambiguity is proposed to be caused by three basic

factors. First, the complexity of the output (usually, intangible outputs are more complex),

where the quality can only be evaluated after use. Second, the existence of variability of

the input in the production process. In the service creation process, the customers

themselves are inputs. Considering the potentially great variability of customers, this can

lead to high levels of performance ambiguity. Third, the level of customer involvement in

the service creation process. Depending on the type of service, customer involvement will

vary and the higher the involvement the higher will be the ambiguity.

 Performance ambiguity, as a dimension of transaction specific uncertainty, means

uncertainty to all the parties involved in a transaction. Customer induced uncertainty,

however, is the uncertainty faced by the organization that is caused by increasing customer

interaction. To understand customer induced uncertainty, it is important to examine how

performance ambiguity might take shape in determining organizational task uncertainty.

Whenever there is an interaction between an organization and a customer, two types of

output are involved. These outputs would include the specific product or service of the

particular interaction and the customer's experience of the particular encounter. Every

encounter between the customer and the organization does not, though, always end up with the customer buying the organizational goods or services. Nevertheless, all interactions of an organization with its customers will include customers' experience of the interaction. As the experience of the transaction itself is intangible, it would be ambiguous for the organization to assess the quality of its customers' experiences. Therefore, all transactions would produce some amount of ambiguity to the organization, which might lead to customer induced uncertainty.

Customer induced uncertainty might also be caused by the type of output for which there is an interaction between the customer and the organization. If the interaction involves a buying decision, or the actual buying of goods or service by the customer, any intangibility associated with the particular product or service would induce ambiguity in the encounter. In a mostly service providing organization, it would be hard for the organization to determine the quality of the output, as it would depend to a large degree on the customer's perception. In manufacturing organizations, as the customization of products increases, it is logical to assume that the intangibility associated with the product also increases. If a product is highly customized, customer's perception regarding the quality of customization becomes important, which adds to the ambiguity and in turn the uncertainty faced by the organization. Furthermore, during the customization process customer participation becomes very important. Often customers are required to actively participate in determining the customized features of products. As the willingness and the ability of the customer to actively participate is difficult to predict, it causes ambiguity and uncertainty to the organization. Therefore, uncertainty induced by customers comes from

the fact that it is ambiguous and difficult for the organization to measure the quality of experience of the interaction and the intangibility associated with the product or service.

Customer induced uncertainty that comes from ambiguity of organizational interactions with its customers may also be caused by the variability of inputs and the degree of customer involvement. Inputs used by organizations that often interact with customers, may include all or a combination of the customer, the employee, information, organizational assets, and other resources. As the variability of these inputs increases, the interaction becomes more and more complex. Accordingly, it becomes increasingly difficult for organizations to understand and predict successful organizational processes that require customer interaction. This increasing difficulty in assessing organizational processes is due to the ambiguity generated by customers as inputs to the organizational process.

Ambiguity in organizational activities may also come from the sheer degree of customer involvement in organizational activities. Customer involvement has been a popular variable in the service literature. Customer involvement can be passive, active or both. An increase in customer contact, that includes both passive and active customer involvement, will increase the level of uncertainty faced by the organization (Chase, 1978, 1981). Mere passive customer contact with the organization can be considered as customer involvement. According to Mersha (1990), active participation by customers in the organizational activities should be considered as a higher level of customer involvement that brings more complexity and ambiguity to the organizational activities. Kellogg and Chase (1995) have developed a measure of customer involvement.

Considering degree of customer involvement as a type of organizational uncertainty, Chase and Tansik (1983) proposed that organizations need to adjust their structures accordingly.

If an organization is involved in numerous interactions that require a high degree of customer involvement, customers become a part of the organizational inputs. Furthermore, if the organization deals with a diverse customer base, then the diversity of inputs becomes even higher. A highly diverse customer base might cause the organizational agents (employees involved in the transformation process) to continually adjust their approaches to complete transactions, which would cause ambiguity in organizational activities. Therefore, organizations with highly diverse customers will have difficulty in predicting activities to successfully complete their transactions. This in turn would result in organizational uncertainty caused by customer interaction.

In understanding the impact of the increasing trend of customer interactions on organizations, the above paragraphs focus on the ambiguity brought in by customers. In essence, ambiguity faced by an organization that is caused by customer interaction comes from three elements. These three elements are the extent of intangibility in the organizational activities that comes from the organizational output and the customer-organizational interaction, variability of customers, and the degree of customer involvement. As these factors increase, the resulting increase in ambiguity faced by the organizational decision makers will cause higher customer induced uncertainty to the organization.

<u>Customer Importance</u>. The importance of a transaction also influences customer induced uncertainty. According to Jones (1990), transaction specific uncertainty increases if the transaction includes assets that are specifically intended for a particular customer and are not transferable. This concept can be applied to understand how such non transferable assets of a transaction may cause customer induced uncertainty to the organization.

Arguably, the importance of a specific customer that is interacting with the organization depends on the value of the assets specific to the interaction and on the extent to which these assets can be utilized for other transactions. To understand this, one could consider an interaction regarding a decision by a customer to buy a product or service for which the organization needs to utilize and create assets that can not be fully transferred to make products or services for any other customers. In that case, if the customer decides not to complete such a transaction, the organization loses valuable assets.

For an organization that has a high proportion of its customers engaged in such transactions, the degree of customer importance increases because the probability of losing valuable assets associated with each customer increases. In other words, organizational decision makers influenced by these types of customer interactions will face higher unpredictability of the outcomes of their decisions regarding asset utilization. This would cause task uncertainty to the organization until the customer actually buys the product or the service. The extent of this uncertainty will increase with the increase in the value of the assets utilized and created by the organization for a transaction with a specific customer.

Moreover, the increase in this uncertainty will also depend on the extent to which the assets created and utilized in a transaction are non transferable. In contrast, if the overall value of these investments is relatively low, the uncertainty created by these interactions may not be very high.

Therefore, if an organization utilizes and creates highly non-transferable assets for the majority of its customers and if it makes large investments in these assets, then it can be concluded that the organization encounters a high degree of customer importance. In such organizations decision makers influenced by customer interactions will encounter higher unpredictability of outcomes of their decisions regarding asset utilization. Therefore, it is logical to propose that an increase in customer importance will cause an increase in unpredictability of decision regarding asset utilization, which in turn, increase customer induced uncertainty.

Acquisitive Customer Behavior. Yet another reason for customer induced uncertainty to the organization is uncertainty arising from the intent of the customer. Bowen and Jones (1986) argued that role conflict is a cause of transaction specific uncertainty. Jones (1990) proposed a similar concept, which he called opportunism, as a source of transaction specific uncertainty. These concepts can also be utilized to understand customer induced uncertainty faced by organizations. Opportunistic behavior is based on the expectation that the result of competitive behavior is better than that of cooperative behavior. Probability of role conflict increases with a potential increase in the benefits of opportunism.

Arguably, the extent to which acquisitive behaviors by customers are expected by organizations might also determine customer induced uncertainty. To understand customer induced uncertainty caused by customers' acquisitive behavior, one must understand two components that might determine the extent of acquisitive behavior. One component that determines the degree of acquisitive behavior is the extent to which there is an opportunity for acquisitive behavior by customers. Opportunity for an acquisitive customer behavior depends on the ability of the customer to take acquisitive actions and the value of such an action as opposed to a cooperative action. Possibility of acquisitive behaviors by customers would be directly related to the customer induced uncertainty to the organization. The second component that determines the degree of acquisitive behavior is the extent to which the organizational agents expect acquisitive behavior from customers. In other words, it is the organizational expectation of the probability that customers will seize opportunity for acquisitive behavior. The organizational expectation of acquisitive customer behavior would depend on how familiar the organization is with its customers. In other words, the degree of new customers as opposed to repeat customers would be directly related to the organizational expectation regarding acquisitive behavior by customers. Such organizational expectation would be lower if the majority of organizational interactions are with repeat customers as opposed to a new customers.

Therefore, when organizational agents believe that there are opportunities for acquisitive behavior by customers, and a high proportion of organizational customers are not regular customers, the organization will face high acquisitive behavior. Organizations that face high customer acquisitive behavior encounter dilemmas in decision making

involving customer input. This dilemma contributes to the organizational task uncertainty. This type of uncertainty to the organization is created by the customer involvement and hence, adds to the customer induced uncertainty.

Summary

With concepts borrowed from the service literature, the above discussion defines customer induced uncertainty. It explains that customer induced uncertainty is an organizational level variable. This concept explains the uncertainty to the organizations caused by the extent and type of customer involvement. Three different variables are explored that produce customer induced uncertainty . These three types of customer induced uncertainty (also referred as variables, constructs) are customer induced ambiguity, customer importance, and customer acquisitive behavior. While a logical cause for the inclusion of these components exists, however, the concept of customer induced uncertainty is still being developed. As such, it is best to summarize the above arguments in the form of a proposition.

> Proposition1: Customer induced uncertainty contains three different constructs that measure customer induced ambiguity, customer importance, and customer acquisitive behavior.

Explanation of the concept of customer induced uncertainty suggests that it is a major and increasingly important component of the contemporary organizational task environment. Having identified and developed the concept, the next step is to examine its influence on organizational activities. It is well established in the organizational theory

literature that environmental uncertainty has a direct relationship with organizational design. Therefore, the utility of these newly developed constructs can be explored by examining the impact of these variables on organizational design variables. The following section provides a brief review of the environment organizational design contingency theory and proposes relationships between customer induced uncertainty variables and organizational design variables.

<div align="center">Environment - Structure/design Contingency</div>

Despite many controversies (Schoonhoven, 1981; Shenkar, Aranya & Almor, 1995), contingency theory remains one of the most popular approaches within the organizational theory literature. Meyer and Associates (1978) asserted that contingency theory is one of the most widely accepted in organizational theory literature. Moreover, judging by the number of works on contingency theory, the theory is one of the most popular in the management literature. Prominent critiques of the contingency approach have not questioned the basic relationships proposed in the theory. Most of the criticisms are based instead on the lack of clarity and methodological problems in contingency theory related works (Schoonhoven, 1981). Other criticisms are based on the disparity in the conceptualization and measurement of main variables, including uncertainty (Shenkar, Aranya, & Almor, 1995). With a clearly developed and measurable concept, however, used to examine its influence on organizational design variables using sound methodological techniques, a contribution to the contingency theory literature can be made with minimal criticism.

To explain the influence of customer induced uncertainty on appropriate organizational design variables, the following discussion starts with a general overview of the contingency perspective. This overview is followed by a more specific discussion of customer induced uncertainty and organizational design relationship. Next, specific organizational design variables are identified for their relationships with customer induced uncertainty. Finally, specific hypotheses are developed to test relationships between customer induced uncertainty and the specific design variables.

According to Galbraith (1973), two assumptions of contingency theory are:

- There is no one best way to organize.

- Any way of organizing is not equally effective under all conditions.

An overall assumption that can represent the contingent theory is that "the best way to organize depends on the nature of the environment to which the organization relates" (Scott, 1992, p. 89). Lawrence and Lorsch (1967) coined the term contingency theory. According to them, organizational requirements will vary depending on the kind of environment the organization faces.

In 1961, British behavioral scientists Tom Burns and G. M. Stalker, in a landmark study, proposed two types of organizational design for successfully counteracting environmental demand. They developed two distinct structural designs called mechanistic organization and organic organization. Mechanistic organizational design is characterized by rigid bureaucracies with strict rules, high division of labor, top-down communication focusing on efficiency, whereas organic organizational design is flexible, utilizes cross trained labor, de-emphasizes top down communication and formalized hierarchy. Burns

and Stalker's study revealed that mechanistic organizational design is superior when the environment is relatively low in uncertainty and organic design is superior when the environment is relatively high in uncertainty.

Lawrence and Lorsch (1967) proposed that an organizational environment characterized by high uncertainty and rapid change presents different threats and opportunities to organizations than one that is characterized by low uncertainty and stability. According to their study, the more varied the environment faced by an organization, the higher the degree of differentiation in design required for the success of the organization. Moreover, the higher the degree of differentiation, the higher the degree of coordination required by a successful organization. Differentiation comes from division of labor and technical specialization, whereas coordination comes from formal hierarchy, standardized policies, rules, procedures, departmentalization, committees and cross-functional teams, human relations training, and individuals and groups acting as liaisons between specialists. Therefore, according to Lawrence and Lorsch (1967) study, successful organizations will have a proper balance between differentiation and integration based on the type of environment they face.

According to Galbraith's (1973, 1977) studies, environmental uncertainty influences organizational information processing. Galbraith proposes that high environmental uncertainty will require a high degree of information processing by organizational decision makers if the organization is to succeed. Various design arrangements have been suggested for countering high levels of environmental uncertainty. Most common among them are the use of rules, programs, or procedures, the hierarchy of

authority, and professionalism. These studies have generally examined the relationships

between overall task uncertainty and specific design variables. With the introduction of

customer induced uncertainty, an important and contemporary aspect of task uncertainty,

this study provides a more comprehensive investigation of uncertainty and its impact on

organizational design variables.

As discussed earlier, a popular stream of research based on contingency theory

examines the environment - design relationships. However, this study argues that the

traditional models that have been used to study these relationships lack an increasingly

important component of task uncertainty - *customer induced uncertainty*. The importance

of this concept can be more clearly illustrated by exploring specific organizational

responses to this uncertainty. Therefore, this study suggests an environment -

organizational design contingency model that focuses specifically on customer induced

uncertainty (see Figure 2).

| Customer Induced Uncertainty | → | Organizational Design |

Figure 2. Customer Induced Uncertainty and Organizational Design Contingency

The above model makes a conceptual case for revising current models of the

environment design relationship to examine a new factor that accounts for the customer

induced uncertainty brought about by interactions between organizations and customers.

The potential usefulness of the model can be demonstrated by applying it in the examination of specific relationships. Before doing so, though, it is important to examine various design variables to identify those that are most appropriate for this study. Therefore, it is important to understand how and to what extent design variables might be affected by customer induced uncertainty variables.

Hypotheses Development

Numerous organizational design variables have been studied in relation to environmental uncertainty. According to Tosi and Slocum (1984), in general, organizational design variables are easier to understand when compared to other variables in contingency theory. Despite the criticism of the simple nature of the mechanistic-organic continuum, there have been very few disagreements on structural dimensions compared to that on the uncertainty concept (Shenkar, Aranya & Almor, 1995). Many researchers have worked on organizational design variables. A few prominent variables are: organic vs. mechanistic design (Burns & Stalker, 1961), centralization and formalization (Lawrence & Lorsch, 1967), and standardization, centralization, professionalism, reducing the need for information processing and increasing capacity to process information (Galbraith, 1973). According to Schoonhoven (1981), Galbraith (1973) referred the use of rules, programs, or procedures and hierarchy of authority to standardization and centralization respectively.

While a number of relationships could be examined, this study focuses on a few popular design variables from Galbriath's (1973) work. Despite criticism of several

contingency theories for their ambiguity, Galbraith's (1973) arguments remain convincing. According to Schoonhoven (1981), Galbraith is very clear on design variables in his contingency relationships. The two basic assumptions of Galbraith (1973) are: (1) the higher the task uncertainty, the higher the amount of information that must be processed, and (2) different structural arrangements possess different information processing capability. As information processing depends on the level of task uncertainty and information processing also depends on structural arrangements, organizations should adapt structural arrangements based on the level of task uncertainty. Proposed as an important aspect of task uncertainty, functional understanding of customer induced uncertainty can thus be demonstrated by testing its influence on Galbraith's design variables.

Galbraith (1973, 1977) developed an information processing model that explains the relationships between the level of uncertainty, information processing, and structural arrangements. Several structural dimensions, including many conventional ones, have been used in the model. These dimensions are: rules and programs, hierarchical referral, professionalism and five other strategies that Galbraith calls "new design variables." According to Galbraith (1973), by using these five "new design variables" organizations can respond to uncertainty either by reducing the need for information processing or by increasing their capacity to process information. Three of these "new design variables" are: environmental management, creation of slack resources and creation of self-contained tasks, which are the ways suggested to reduce the need for information processing. The other two "new design variables" are: investment in vertical information systems and

creation of lateral relations, which are the ways to increase capacity to process information.

The focus of this study however, is to examine the influence of customer induced uncertainty on the first three design variables of Galbraith's (1973) model. These three variables, rules and programs, hierarchical referral, and goal setting, refer to the design variables popularly known as standardization (or formalization), centralization (decentralization), and professionalism respectively. The reasons for choosing these three variables are three fold. First, these variables are selected for this study since the largest body in the contingency theory focuses on these variables (Schoonhoven, 1981). Second, by examining these variables this study captures the gist of prominent environment-design contingency research. Finally, the purpose of testing relationships in this study is not as a comprehensive examination of contingency theory, but as an examination of the contemporary importance of customer induced uncertainty as a concept by examining its influence on organizational design. To do so, the following sections develop specific hypotheses based on the relationship individual aspects of customer induced uncertainty with formalization, centralization, and professionalism respectively. These relationships are presented in figures 3 and 4.

As discussed earlier, the three types of customer induced uncertainty are: customer induced ambiguity, customer importance, and customer acquisitiveness. Accordingly,

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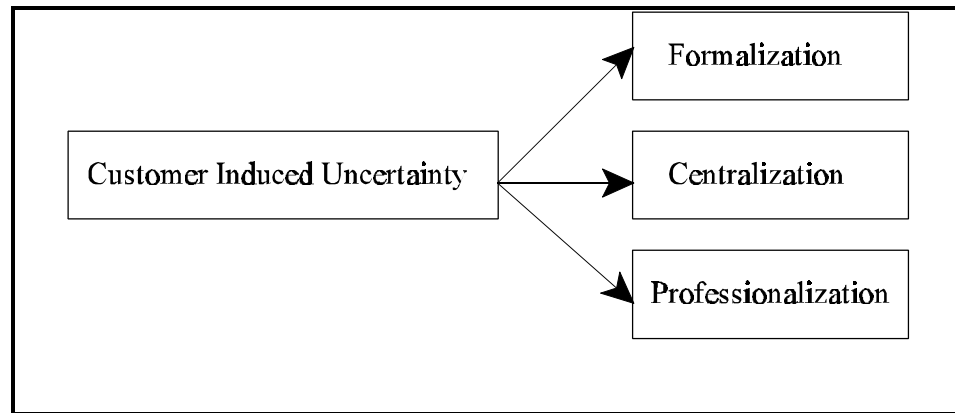
Figure 3. Relationships Between Customer Induced Uncertainty and Organizational
Design Variables.

hypotheses are developed based on these three specific types of customer induced

uncertainty. However, each of these variables might contribute to the relationships in

different degrees. This study proposes relationships between customer induced uncertainty

and organizational design variables (Fig. 3). Since the study proposes that there are three

types of customer induced uncertainty and collects data on three different constructs, it

examines three relationships between each of the customer induced uncertainty variable

and three separate organizational design variables (Fig. 4). Also, based on the existing

contingency theory, directions for specific relationships were proposed for each

hypothesis. Moreover, a set of three hypotheses were developed to test the relationships

between all three customer induced uncertainty variables combined and individual

organizational design variables. Therefore, altogether twelve hypotheses were developed

for this study.
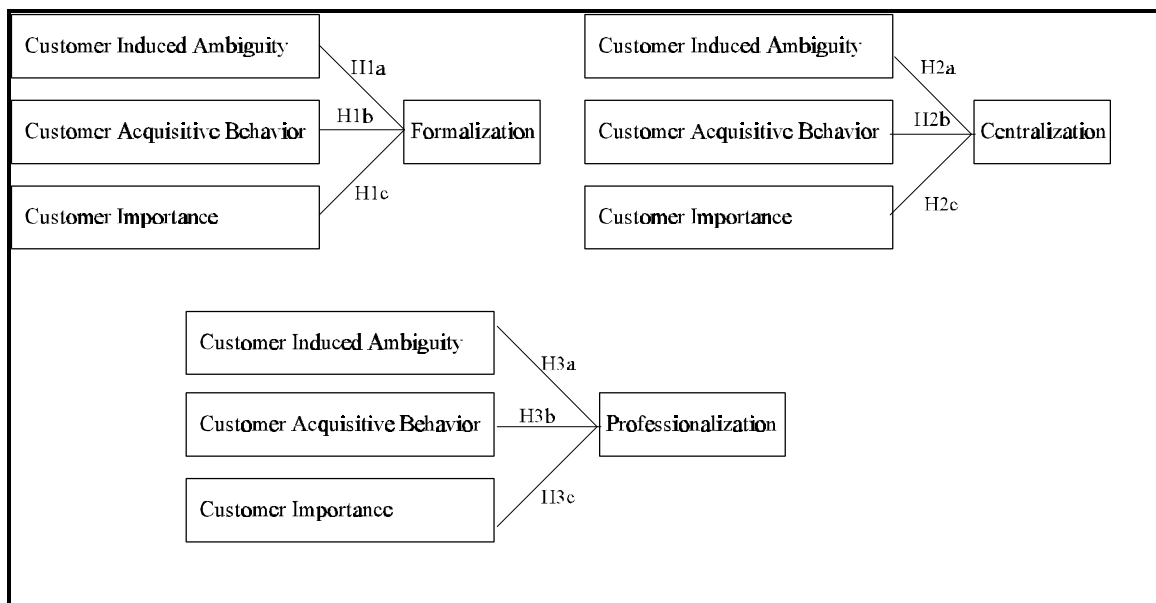
Figure 4. Relationships Between Customer Induced Uncertainty Variables and Design

Variables

Figure 3 shows the three major propositions. Figure 4 expands the model to show three hypotheses based on each proposition presented in figure 3. The development of each specific hypothesis is presented below.

Formalization

According to Pugh, Hickson, Hinings, and Turner (1968), formalization is defined as the presence of written rules, procedures, policies, and other control mechanisms. Rules, programs, and procedures are specified behaviors and guidelines for coordinating interdependent tasks. These are specified decisions made prior to their execution based on

organizational exposure to different situations. These pre-specified decisions reduce the

need for communication between interdependent tasks. According to Scott (1992),

formalization includes explicit structure of relations. The extent of formalization of an

organization depends on the degree that precise and explicit rules govern behaviors.

Formalization of an organization depends on the degree to which behaviors are made

explicit, job descriptions are made specific and also on the degree of use of documents and

rules for coordination (Shenkar, Aranya & Almor, 1995).

Formalization works efficiently only when the job-related situations can be

anticipated. Effectiveness of rules, programs and procedures depends on the extent to

which an organization faces repetitive decision situations (Galbraith, 1977). This is

because without previous experience, rules and programs can not be worked out in

advance to spell out and guide appropriate behavior. Therefore, it is logical to assume that

formalization is limited to those task-related situations that can be anticipated in advance.

The level of customer induced uncertainty faced by an organization depends on the

unpredictability of the situation arising from customers interaction with the organization.

From the above discussion it is clear that if an organization faces high levels of customer

induced uncertainty, it needs to treat most situations as new. Therefore, formalization

wouldn't work in such an organization. Thus, it can be concluded that in general, the

higher the customer induced uncertainty faced by an organization, the lower would be the

formalization of its structure.

> Proposition 2: customer induced uncertainty is inversely related to the degree of
> formalization.

Proposition 2 suggests a negative relationship between degree of formalization and the overall customer induced uncertainty. It is also proposed earlier (proposition 1) that customer induced uncertainty is made up of customer induced ambiguity, customer importance, and customer acquisitiveness. Based on these two propositions, the following sections develop hypotheses suggesting separate relationships between these variables and formalization.

Customer induced ambiguity includes the level of intangibility of the interaction between the organization and customers, variety of customers, and the degree of customer involvement. A higher customer induced ambiguity might mean that most customer interactions of the organization would involve high intangibility, the organization would have a highly heterogeneous customer base and a high degree of customer involvement. Thus, a higher customer induced ambiguity would make it harder for organizational decision makers to anticipate task related situations. Given the earlier argument that appropriate use of formalization is limited to those task-related situations that can be anticipated in advance, it is logical to hypothesize:

H1a: There is a negative relationship between customer induced ambiguity and the degree of formalization.

According to the earlier discussion, organizational expectation of acquisitive behavior depends on the ability of customers to behave acquisitively, the value of such acquisitive behavior as opposed to cooperative behavior to the customers, and the level of familiarity of customers to the organization, which depends on the proportion of repeat customers as opposed to new customers. Organizational expectation of customers

acquisitive behavior would be high when customers' ability to behave in such a way is high, the value of such behavior is higher than that of cooperative behavior, and a high proportion of customers are new to the organization. Naturally, in organizations with higher expectation of customer acquisitive behavior, organizational decision makers' ability to predict customer behavior would be low. As a result, formalization would not work in organizations with a high degree of customer acquisitive behavior. Therefore, it can be hypothesized that:

H1b: There is a negative relationship between customer acquisitive behavior and the degree of formalization.

The extent of customer importance depends on the amount of organizational assets involved in transactions with specific customers and the extent to which those assets are non transferable to transactions with other customers. If most transactions in an organization involve large amounts of assets that are non transferable, then the organization encounters high customer importance. Consequently, as the degree of customer importance increases, the probability of the organization's losing valuable assets increases. In other words, a higher level of customer importance would increase the potential risk to the organization's task related decisions. This additional risk due to the increase in customer importance might increase unpredictability regarding the outcome of organizational asset utilization to organizational decision makers. As formalization is suitable for managing predictable situation, it might not be suitable for organizations with high customer importance. Therefore, it can be hypothesized that:

H1c: There is a negative relationship between customer importance and the degree of formalization.

Centralization

According to Galbraith (1973), organizations use hierarchy of authority as a method of coordination. The success of the organizational hierarchy depends on the level of task uncertainty. In most organizations, difficult and unexpected problems are solved higher up in the hierarchy. According to Childs (1972), locus of centralized decision-making authority refers to centralization. In other words, in a centralized organization, power and authority remains in the hands of higher-level managers. Hierarchical referral mentioned by Galbraith (1977) is also referred to as centralization of decision making by Schoonhoven (1981). Therefore, in general, centralization refers to the degree to which decision-making is in the hands of senior office holders and decentralization refers to the degree to which decision-making is in the hands of front-line office holders.

There are several reasons for decentralization. These include the need to allow maximum flexibility, to increase responsiveness to local needs, and to increase human touch to the organization (Mangaliso, 1995). Decentralization can be defined as decision autonomy that is shifted to the lower levels in the organization. Decentralization and the related notion of empowerment have received a great deal of recent attention as possible organizational responses to an increasingly turbulent and competitive environment. In such environments, there is a need for organizations to increase both their responsiveness and their adaptability. It is well established in the organizational theory literature, however, that high responsiveness and increased adaptability require employees to have more authority (Miles & Snow, 1995; Pfeffer, 1994). Decentralization, measured by the extent

of the delegation of authority, can be seen as a way to empower employees with more authority. This allows for more responsiveness to task uncertainty.

An important component of task uncertainty, customer induced uncertainty, is created by customer-organizational interaction. As the interactions become more unpredictable and complex, it is less likely that front line workers will have ready made responses available. However, in today's time based competitive environment, organizations that are efficient in responding to their environment are more likely to succeed (Stalk & Webber, 1993). Clearly then, unpredictable and complex situations created by customer-organization interactions that usually occur at the operational level of the organization require organizational members at the front-line to have more decision making authority. Thus, it can be argued that without decentralization it would be difficult for an organization to achieve the level of responsiveness or adaptability necessary when facing high customer induced uncertainty. As centralization is the reverse of decentralization, it is logical to propose that:

> Proposition 3: the higher the degree of customer induced uncertainty faced by an organization the lower would be the degree of centralization of its structure.

Customer induced ambiguity, one of the important construct of customer induced uncertainty, refers to the ambiguity of decision making created by the interaction between customers and the organization. High customer induced ambiguity is created by high intangibility of the customer-organizational interaction, high variety of customers and high degree of customer involvement. As this ambiguity mostly occurs at the front-line of the organization, for efficient task related decision making, front-line organizational members

should make more decisions locally. High customer induced ambiguity calls for higher

decision making ability of the front-line organizational agents. High decision making

ability comes from high delegation of authority that in turn comes from high

decentralization. Therefore, it is logical to hypothesize:

> H2a: There is a negative relationship between customer induced ambiguity and the
> degree of centralization of authority.

Customer acquisitiveness also creates uncertainty to the organizational task

environment. As mentioned earlier, customer acquisitiveness refers to the organizational

expectation of the extent to which customers might behave with guile and self-interest

rather than in cooperation with the organization. Organizations with high customer

acquisitiveness will have a high degree of unpredictability of customer behavior. Thus in

such organizations, front-line organizational members will interact with numerous

acquisitive customers. In order to efficiently deal with such interactions and to restrain

their effects at their origin, front line organizational members require more authority to

make decisions. Since more authority comes from decentralization, it can be hypothesized

that:

> H2b: There is a negative relationship between customer acquisitive behavior and
> the degree of centralization of authority.

Customer importance, as discussed earlier, is derived from the amount of assets

that are used in transactions with specific customers and the degree to which these assets

can be used for transactions with other customers. Large amount of assets that can not be

transferred to transactions with any other customer creates high customer importance to

the organization. If a large percentage of the organizational transactions include high customer importance, the organization should be considered as encountering a high level of customer importance. Moreover, in an organization that is encountering high levels of customer importance, employees mostly interact with important customers. Also, in such organizations a majority of employees that encounter customers are the front line members. In order to make effective and efficient decisions, these front-line members should have the authority to make decisions. Decentralization is a way to increase the decision making authority of the front-line members of an organization. Therefore, by decentralization, such organizations can make sure that front-line members are effective and efficient when dealing with high customer importance. Thus, it can be hypothesized that:

> H2c: There is a negative relationship between customer importance and centralization of authority

Professionalism

Organizational professionalism, as defined by Galbraith (1973), is the degree to which organizations substitute professional training of the workforce for lower levels of training and skills. According to Galbraith, "the shift to craft or professional workers represents a shift from control based on supervision and surveillance to control based on selection of responsible workers" (1973:45). According to Schoonhoven (1981), greater technological uncertainty requires higher professionalism for higher performance. Generally, organizations facing higher task uncertainty require more decision making to be performed at the front-line for efficiency and responsiveness.

As argued earlier, this can be done by providing more decision making authority of the front line organizational members. However, higher decision making authority does not necessarily mean that the front-line organizational members would make correct decisions. According to Galbraith (1973), to make sure that the front-line organizational members would consistently choose the appropriate response to their specific task related environment, organizations should select workers with appropriate skills and attitudes and train them with professional skills. In other words, it is proposed that professionalization of front-line organizational members is a positive response to environmental uncertainty.

The specific task uncertainty, customer induced uncertainty, is caused by interactions between customers and organizational members. A majority of organizational members that interact with customers are front-line organizational members. As customer induced uncertainty increases, the volume of information from the front-line organizational members to the centralized decision makers might overload the hierarchy unless the organization delegates a significant authority to the front-line organizational members (Galbraith, 1977). However, in order for the organizational members to be consistently effective in their response and not overload the hierarchy, they should be hired based on appropriate skills and attitude and should be trained in professional skills. Therefore, it can be proposed that:

Proposition 4: the higher the degree of customer induced uncertainty faced by an organization the higher would the degree of its professionalism.

Customer induced ambiguity, resulting from interactions between customers and organizational members, creates unforeseeable situations for the organizational members.

As the variety of customers, involvement of customers, and intangibility associated with most transactions increase, the ambiguity of the task related decision making induced by customers will also increase. It is clear that this environmental ambiguity is mostly created and introduced to the organization through the front line. As such, organizational members should have the necessary professional skills and attitudes to understand and respond to ambiguous situations. This can only be accomplished by professionalism of front-line organizational members. Thus, it can be hypothesized that:

> H3a: There is a positive relationship between customer induced ambiguity and the degree of professionalism.

The degree of customer acquisitive behavior expected by organizations depends on the ability of most customers to behave in self interest, the value of such behavior to most customers, and the familiarity of customers to the organizations. As expectation regarding all of the above phenomena increases, organizational expectation for customer acquisitive behavior increases. Decisions made by organizational members that are interacting with customers would be most vulnerable to such behavior. As mostly the front line organizational members interact with customers, decisions made by front-line organizational members are most vulnerable to the customer acquisitive behavior. Therefore, in case of high organizational expectations of customer acquisitive behavior, front-line organizational members need to have enough professional skills to be able to evaluate each customer behavior properly. Thus, it can be hypothesized that:

> H3b: There is a positive relationship between customer acquisitive behavior and the degree of professionalism.

Organizations with high customer importance will have high proportions of important customers. As the degree of customer importance becomes higher, organizational members need to have more authority to deal with the customers responsively and efficiently. According to Galbraith (1973), however, organizations that delegate authority for being efficient might face a potential control problem. Front-line organizational members may not consistently be effective, unless they have appropriate knowledge and attitude. Therefore, organizations encountering high customer importance need to have professionally trained front-line members. Therefore, it can be hypothesized that:

> H3c: There is a positive relationship between customer importance and the degree of professionalism.

Overall

Not all organizations, however, will face similar types of customer induced uncertainty. As the model illustrates, the degree of uncertainty that comes from each variable of customer induced uncertainty may vary according to the nature and degree of customer interaction. Sources of customer induced uncertainty such as customer induced ambiguity, customer importance, and customer acquisitive behavior are all likely to influence design variables. Moreover, these three variables combined should explain the appropriate design of effective organizations more strongly than any of the individual variable. Therefore, the overall influence of customer induced uncertainty on the design variables can be more completely understood by examining the combined model, where all

the variables of customer induced uncertainty are present. From the above discussion the

following hypothesis can be drawn.

> H4a: The three variables of customer induced uncertainty (customer induced ambiguity, customer importance, and customer acquisitive behavior) together explain formalization better than any individual variable.

> H4b: The three variables of customer induced uncertainty (customer induced ambiguity, customer importance, and customer acquisitive behavior) together explain centralization better than any individual variable.

> H4c: The three variables of customer induced uncertainty (customer induced ambiguity, customer importance, and customer acquisitive behavior) together explain Professionalism better than any individual variable.

Summary

This chapter describes the literature on organizational environment. It is argued

that our understanding of the contemporary business environment is far from complete.

The chapter proposes that approaches to understanding the external environment are

continuously undergoing changes. To better understand the environment and its influence

on organizational activities, studies should focus on individual factors of the external

environment that are important in the contemporary business phenomena. Continued

importance of customers in recent business operations has been discussed. With increasing

customer involvement, organizations are subjected to varying degrees of uncertainty that

are induced by customers. Therefore, customer induced uncertainty deserves attention for

our endeavor to understand the contemporary environment and its influence on

organizational activities.

Literature based on service operations provides explanation of transaction specific uncertainty. Transaction specific uncertainty is the uncertainty related to specific transaction between customer and organizational employee. However, organizations facing numerous transactions might face uncertainty at the organizational level. With concepts derived from the service literature, and focusing from the organizational point of view, the concept of customer induced uncertainty is developed. A proposition is presented to demonstrate a clear understanding of the concept and factors that determine it. However, for a comprehensive understanding, the concepts impact on organizational activity must be examined. Therefore, ten separate hypotheses are developed to examine the relationship between customer induced uncertainty and organizational design variables. The next chapter provides a comprehensive methodology for testing these proposed relationships.

CHAPTER III

METHODOLOGY

This chapter presents the research procedure and methodology used in the current study. The presentation proceeds in the following manner. A description of the sample and sampling issues begins the presentation. Next, the specific variables for this study are introduced. Also, construction of specific instruments and measures of appropriate variables are presented. Three constructs of customer induced uncertainty and three variables of organizational design are used as independent and dependent variables respectively. All organizational design variables used in this study have been extensively used before. As such, operationalization of such variables is straight forward. However, customer induced uncertainty variables, being new operationalization, deserve explanation. The measurement analysis section provides explanations of the reliability and validity of the three new instruments for measuring customer induced uncertainty variables.

Data Collection

Target Population

The data for this study comes from middle managers of single business organizations or separate SBUs of multi-business organizations. Selection of

organizations was not limited to either service providing organization or goods providing organizations. Instead, no a priori attempt was made to distinguish organizations based on the kind of output they provide (services or manufactured goods). Also, organizations that were selected should have enough employees to have identifiable design characteristics. To ensure this, selected organizations should have at least a few hundred employees. However, to also ensure that the middle managers have adequate information regarding organizational design and employee-customer interactions, small and mid size organizations were selected.

After the organizations are selected, the managers were selected as subjects based on the following criteria: 1. access to information about organizational design. 2. access to information on a vast majority of job analysis and criterion development. and 3. access to employees' feedback on their encounters with customers. Subjects that best fit all these criteria were selected for this study. Usually, administrative/HR/Personnel managers or managers with equivalent rank fulfill these criteria. In most organizations, these managers are involved in job analysis. "Job analysis is associated with determination of the tasks, duties, and responsibilities carried out by job incumbents. Person conducting the analysis wants to know just what the job is all about" (Schmitt & Klimoski, 1991: p.163). Job analysts gather information from multiple sources such as market, supervisors and staff specialists and try to come up with a comprehensive explanation of all tasks. A comprehensive job analysis should provide information about types of employee customer interactions. As they are involved in job analysis and with administration and employees

and their jobs, these managers are expected to know more about their employees' work than any other.

In addition to the literary arguments that administrative/HR/personnel managers are involved in job analysis and come up with a comprehensive explanation of all jobs in a organization, interviews are conducted with middle managers of small and mid size organization. Interviews with five middle managers bolstered the above suggestion that in a majority of small to mid-sized organizations personnel managers, human resource managers or administrative managers have access to information regarding organizational design and job analysis. Therefore, HR/Per/or Admin. managers are used for this study to collect data on design variables as well as on customer induced uncertainty.

Sampling Procedure

Two potential sample frames are considered for this study. The membership list of the Society for Human Resource Management contains a huge number of human resource managers that includes a wide variety of human resource managers spread all over the United States. The second sampling frame can be obtained from the electronic media. Compact disclosure provides a list of human resource managers of most publicly held organizations.

Researchers suggest that sampling bias and validity of the sampled data can be improved by the careful selection of a sampling design (Alreck & Settle, 1985). Similarly, sampling error can be controlled by using appropriate sample size. Many sampling

techniques have been proposed in the literature, such as random sample selection,

stratified sampling, cluster sampling, quota sampling etc. Among them, random sample

selection is a popular sampling technique. According to Alreck and Settle (1985), random

selection of sample units from the sample frame does not always provide a purely random

sample. Nonetheless, this sampling technique appears to generate popularity among survey

researchers. There are several ways to perform random sample selection: Nth name

sampling, random number generator, table of random numbers, physical selection methods

etc. For this study Nth name sampling is used for random sample selection from the

sample frame. Based on the number of subjects in the sample frame and the calculated

number of initial mail outs, N is calculated so that selecting every Nth name from the

sample frame provides a list with the number of names equal to the number of initial mail

outs.

Similar to sampling technique, appropriate sample size calculation is also important

for survey research. An appropriate sample size ensures lower sampling error and higher

reliability of data. Data obtained from the sample with lower sampling error and higher

reliability are likely to produce same or very similar results to data obtained from any

sample of equal size using same sampling technique and same population (Alreck & Settle,

1985). Cohen (1988) proposed that power analysis is a major tool for behavioral scientists

to determine proper sample size.

Power Analysis and Sample Size Calculation

Power of a statistical test represents the probability of rejecting the null hypothesis (Cohen & Cohen, 1983). According to Pedhazur (1982), researchers can seek statistical conclusion validity by trying to reduce both type I and type II errors. Researchers make a type I error when they reject a null hypothesis when it is true. In contrast, they make a type II error when they fail to reject a null hypothesis when it is false. By keeping the alpha level lower, researchers can reduce the possibility of type I error. However, a lower level of alpha might increase the possibility of a type II error. In other words, a lower level of alpha might reduce the power of the statistical test to reject the null hypothesis. This dilemma can be overcome by using a sample size that would provide appropriate statistical power to still reject the null hypothesis when it is false.

Researchers always attempt to perform a powerful test for their hypotheses. However, one must be cautious about the extent of power of his or her test. Too much power might be a detriment to the study, as it might pick up the existence of very insignificant relationships. In other words, with too much power we might find relationships between variables that might not have any practical value. Cohen (1988) proposed that for behavior science, 0.8 would be a desirable power. Three factors of a statistical model determine its power. These factors are: the effect size, the sample size, and the significance level. An increase in any of these three factors would increase the power of the test.

Statistical test of a given hypothesis represent a complex relationship among four parameters: power, effect size, significance level, and sample size (Cohen & Cohen, 1983). Thus, for an effective hypothesis testing a priori planning regarding these four factors is a must. The a priori plan for this study includes setting up three of these factors at recommended levels and calculating the fourth factor based on them. As per Cohen's recommendation a statistical power of .8 is set for this study. A significance level of .05 is used here because most behavioral researchers have accepted this as a standard. A power analysis software, GPOWER (Faul & Erdfelder, 1992) is used to calculate sample sizes for recommended large, medium and small effect sizes respectively. Results of the a priori analysis for F-test in multiple regression with three independent and one control variables are summarized in Table 3.

Table 3. F-test in Multiple Regression, a Priori Analysis, Accuracy Model

Effect Size f^2	Large = .35	Medium = .15	Small = .02
Total Sample Size	40	85	602
Critical F	$F(4, 35) = 2.6415$	$F(4, 80) = 2.4859$	$F(4, 597) = 2.3869$
Lamda	14.0000	12.7500	12.0400

(Alpha set at .05, Power set at .8, Total number of independent variables and control= 4)

After running the GPOWER software for small, medium, and large effect size this researcher elected the probable effect size for this study. For this estimation, the

researcher considered that data in this study should be used to examine theorized

relationships between variables, called cell 5 research (Snow & Thomas, 1994). As the

basic model for this study, the environment - structure contingency, is well developed, the

researcher does not feel that a small effect size is likely for this study. Furthermore,

efficiency is always an important consideration for all researchers. Given the large

difference in sample sizes between tests with a priori small and medium effect sizes, it is

apparent that test with medium a priori effect size is more efficient. Accordingly, the

researcher elected medium effect size as most appropriate for the study. Therefore, for this

study the sample size required for multi variate F statistic with three independent and a

control variables is 85. Although this calculation recommends a sample size of 85, the

factor analysis described below might require more samples based on the number of items

used for the analysis. As a general rule, Hair, Anderson, Tatham and Black (1998)

suggest that a minimum of five observations per item is required for the analysis. For this

study, a six to one ratio is used to calculate the sample size required for the factor analysis.

As there are 15 items in the largest instrument for factor analysis, the required sample size

according to the six to one ratio is 90. Therefore, overall sample size required for this

entire study is 90.

Data Collection Technique

Survey research methodology is an appropriate data collection technique for this

study. Surveys can be used to collect a wide variety of information on numerous topics.

According to Alreck and Settle (1985), reason for survey research is to understand attitudes, decisions and behaviors. Attitude comes before the action and consists of knowledge, belief, and feeling about things and decision focuses on the process rather than the result. Decision process depends on information sources and evaluation of the information. Finally, behavior measure represents specific actions. This study tries to collect data to measure managers perception of organizational uncertainty and organizational actions in terms of design. Perception of organizational uncertainty depends on managers' knowledge, beliefs and feelings about their environment. Therefore, survey should be an appropriate technique because this study measures the attitude, decision process and behavior of the organization.

<div align="center">Instrument and Measures</div>

The study examines the relationships between customer induced uncertainty and three organizational design variables. The independent variables consist of three different types of customer induced uncertainty: customer induced ambiguity, customer importance and customer acquisitive behavior. The three dependent variables are: formalization, centralization and professionalism. This section begins with a discussion on the operationalization of the measure of customer induced uncertainty variables. Besides independent and dependent variables, this study used a control variable, which is organizational size. Instruments and measures for independent, dependent and control variables are presented next.

Independent Variables

Customer Induced Uncertainty Variables

Customer induced uncertainty variables are measured by using a newly developed measurement instrument. To provide content validity, the first step in developing a measurement instrument is to clarify the concepts that underlie them. The domains of customer induced uncertainty variables that provide the foundation of the content validity was demonstrated in Chapter two. The literature review is closely and comprehensively based on the literature that describes customer induced uncertainty variables. The previous chapter provides detailed understanding of the three types of customer induced uncertainty, which suggests that these types of customer induced uncertainty faced by a business can be measured by a variety of items related to the type and degree of customer and organizational interactions. According to the detailed literature review, there are three different constructs of customer induced uncertainty; customer induced ambiguity, customer importance, and customer acquisitive behavior.

The instruments for measuring these customer induced uncertainty constructs are developed by identifying several items from the existing literature (Bowen & Jones, 1986; Jones 1990; Kellogg & Chase, 1995; Heide & Miner, 1992; Larsson & Bowen, 1989; Nooteboom, 1996; Nooteboom, Berger & Noorderhaven, 1997). A summary of the three constructs of customer induced uncertainty and their corresponding literature sources is presented in a tabular form (See table 4).

Table 4. Constructs of Customer Induced Uncertainty and Respective Sources

Constructs	Sources
Customer Induced Ambiguity	Loden (1995); Kellogg & Chase (1995); Jones (1990); Heide & Miner (1992); Larsson & Bowen (1989); Bowen & Jones (1986)
Customer Acquisitive Behavior	Jones (1990); Larsson & Bowen (1989); Bowen & Jones (1986); Nooteboom (1996)
Customer Importance	Jones (1990); Larsson & Bowen (1989); Bowen & Jones (1986); Nooteboom, Berger & Noorderhaven (1997)

The following section describes the development of the measurement instruments for customer induced uncertainty variables, focusing on assessment of the reliability and validity of the instrument. To do so, for each construct, it is important to perform a measurement analysis. A measurement analysis provides the assurance that the findings reflect an accurate measure of underlying constructs. First, the measurement analysis includes the assessment of the instrument's reliability. The reliability makes sure the ability of the instrument to consistently yield the same response. After determining the reliability of the instrument, its validity must be assessed. Validity of an instrument tests its ability to measure what it is supposed to measure. Three dimensions of validity have been assessed in this analysis: content, convergent and discriminent.

Instrument Development

Development of instruments for measuring customer induced uncertainty variables

includes a description of constructing items for measuring different constructs of customer

induced uncertainty and their assembly into three instruments. This section also describes

the testing of the instruments. A description of the test results and a discussion of the

instrument's reliability and validity is also included. Accordingly, the following paragraphs

begin with a brief definition of individual constructs of customer induced uncertainty,

which is followed by a set of items that determine the respective construct. Next, this

section presents results of the analysis of data gathered by using each instrument. Finally,

based on the test results, a discussion of the reliability and validity of these instruments is

presented.

Customer Induced Ambiguity

Customer induced ambiguity can be defined as the ambiguity faced by an

organization due to its customer interaction. There are three factors that determine

customer induced ambiguity: the extent of intangibility faced by the organization due to

the customer interaction, the variability of customers and the degree of customer

involvement. A set of items is developed based on the existing literature that measures the

three above mentioned elements. A seven point Likert type scale is used to collect data.

The items consist of statements that measure respondents' assessments of the level of

intangibility, variability of customers and degree of customer involvement faced by the organization (see Appendix C).

The pool of items for this dimension is compiled by selecting appropriate items from existing measurement instruments and by developing a few additional items based on relevant literature. Kellogg and Chase's (1995) measure for customer contact, Heide and Miner's (1992) measure for performance ambiguity, Parasuraman, Berry and Jaithamal's (1985) measure for service quality and Loden's (1995) dimensions of diversity are used for developing the majority of the items. Additional items are developed by modifying Bowen and Jones' (1986), Larsson and Bowen's (1989), and Jones' (1990) definitions of performance ambiguity in transaction specific uncertainty. Table 5 shows the items that are used to measure customer involvement. Subjects were asked to respond, using a seven point scale, the extent to which they agree or disagree with each item. Items such as duration of customer contact, direction of communication, active participation, and time within the organizational facility measure customer involvement, a component of customer induced ambiguity (Jones, 1990; Larsson & Bowen, 1989; Bowen & Jones, 1986) (Table 5). A majority of these items are developed based on Kellogg and Chase's (1995) instrument of customer contact.

In addition to customer involvement, the intangibility of customer-organizational interactions also adds to the customer induced ambiguity (Jones, 1990). Accordingly, items are developed to measure this intangibility. Items to measure intangibility are

developed based on Parasuraman, Berry and Jaithamal's (1985) instrument of service

quality.

Table 5. Items to Measure Customer Involvement

No	ITEM
1	Duration of a typical customer contacts with organizational members
2	Primary direction of the majority of communication between customers and organizational members.
3	Degree to which a typical customer actively participates in organizational activities (helping transaction process by filling out forms, actively participating in the design, packaging, transportation process, etc. by working out desired specifications)
4	Extent of encounters between members of our organization and customers that take place inside the organizational facility.
5	Extent to which members of the production and operations department directly communicate with customers.

Table 6 shows the items used to measure the extent of intangibility induced by

customers. Subjects were asked to respond, using seven point Likert type scale, the extent

to which they agree or disagree with each item. Included here are items such as degree of

judgement to be used by employees, degree of intangibility of output, importance of

customer perceptions, and measure intangibility (Table 6). Besides using the service

quality instrument, ideas from Jones (1990) and Bowen and Jones (1986) are used to

develop the following items.

Table 6. Items to Measure Customer Induced Intangibility

No.	ITEM
1	Degree of judgment used by most member of the organization to understand customers' communication.
2	Proportion of intangibility offered by the organization
3	Importance of customers' perception about our organizational facilities (condition of our building, equipments, furniture etc.)
4	Importance of what customers think of the way services and/or products are made in the organization.
5	Importance of customers' perception about the individual attention displayed by members of the organization.
6	Importance of customers' perception about the courtesy displayed by members of the organization.
7	Importance of customers' perception about the willingness to help by members of the organization.

Next, items are developed to measure diversity of customers, as this diversity

contributes to the organizational ambiguity. According to Thomas (1996), diversity is

defined as the multitude of individual differences that make people different from or

similar to one another. If a group of people scores high on the diversity scale, the group

represents people who are highly different from one another. A list of relevant items to

measure customer diversity are developed based on the diversity dimensions proposed by

Loden (1995). Subjects were asked to respond, using seven point Likert type scale, the

extent to which they agree or disagree with the following items (Table 7).

Table 7. Items to Measure Variability of Organizational Customers

No.	ITEM
1	Gender diversity of the organizational customers.
2	Diversity of ethnic background of the organizational customers.
3	Diversity of racial background of the organizational customers.
4	Diversity of national background of the organizational customers.

Customer Acquisitive Behavior

As presented earlier, customer acquisitive behavior consists of two components. The extent to which organizational members believe that there are opportunities for acquisitive behavior by customers, and the proportion of organizational customers that are not regular customers. The opportunity of acquisitive behavior depends on customers' ability to take acquisitive actions and the value of such actions as opposed to cooperative actions.

A pool of items for measuring customer acquisitive behavior is developed based on existing measurement instrument of opportunism, which is an important dimension of organizational trust measure (Bromiley & Cummings,1995) and other pertinent literature (Jones, 1990; Larsson & Bowen, 1989; Bowen & Jones, 1986). Organizational subjects were asked to respond, using seven point Likert type scale, the extent to which they agree or disagree with each item (Table 8).

Table 8. Items to Measure Customers' Acquisitive Behavior.

No.	ITEM
1	Possibility for customers to take upper hand when interacting with the organizational members.
2	Possibility for customers to take advantage when the organization is vulnerable
3	Possibility for customers to step on organizational members.
4	Extent to which customers can gain when they are deceitful/opportunistic
5	Proportion of repeat customers.

Customer Importance

Customer importance is determined by the degree of non-transferability of assets utilized and created for the majority of customer interaction and the value of organizational investment on those assets. Therefore, essentially, there are three elements of this construct: non transferability of the process and created assets, proportion of customer interactions that includes non transferable assets, and the value of non transferable assets to the organization.

A pool of items for measuring this construct is developed from relevant literature (Jones, 1990; Larsson & Bowen, 1989; Bowen & Jones, 1986; Nooteboom, Berger & Noorderhaven, 1997). Organizational subjects were asked to respond, using seven point Likert type scale, the extent to which they agree or disagree with each item (Table 9).

Table 9. Items to Measure Customer Importance

No	ITEM
1	Extent of employee time is devoted for individualized interaction with customers.
2	Extent of organizational investment on individual customer
3	Individualized equipments for processing products and services for most customers.
4	Extent of individualized skills needed for processing products and services for different customers.
5	Extent of individualized ways equipments are used for customers.
6	Extent of specific knowledge about a typical customer is needed to effectively serve him or her.
7	Extent to which investments made by the organization to acquire specific knowledge about procedures desired by customers are non transferable
8	Extent to which products and/or services created for a specific customer is non transferable.
9	The value of organizational resources (the physical, human, informational and financial) needed to create products and/or services for an individual customer.

Questions based on most of these items were prepared for a pilot study. Together, all these questions were intended to capture the three types of customer induced uncertainty. Based on pilot study findings, a revised questionnaire (Appendix C) was used for final data collection. Data on each item were collected based on a seven point Likert type scale. These data then were analyzed to identify the underlying dimensions (uni-dimensionality for customer importance and customer acquisitive behavior and multi-dimensionality for customer induced ambiguity) and to demonstrate reliability and validity of the instrument.

Dependent Variables

Organizational Design Variables

In addition to the instrument for the customer induced uncertainty, a questionnaire

for gathering data on formalization, centralization and professionalism is also used. This

questionnaire is generated from the existing well documented and proven scales found in

organizational theory literature. A summary of variables and their corresponding sources is

presented in tabular form (Table 10).

Table 10. Organizational Design Variables and Sources for Their Measurement

DESIGN VARIABLES	SOURCES
FORMALIZATION	Miller (1991); Miller & Droge (1986); Khandwalla (1974)
CENTRALIZATION	Miller (1991); Miller & Droge (1986); Khandwalla (1974)
PROFESSIONALISM	Heydebrand (1973); Schoonhoven (1981)

Formalization

Items are developed for measuring formalization, by modifying published

instruments. Formalization measure used here is derived heavily from Miller's (1991)

questionnaire. Precursors of Miller's (1991) work (Miller & Droge ,1986; Khandwalla,

1974) are also examined for possible inclusion of certain items. The resultant questionnaire

is a modified version of Miller's (1991) instrument and the modification is made to suit the

specific needs of the present study. A copy of the questionnaire for measuring

formalization in the current study is presented in the appendix C.

Centralization

An instrument for measuring Centralization for the current study is also developed

from the work of Miller (1991), that is traceable to Miller and Droge (1986) and to Aston

measures (Inkson, Pugh, & Hickson, 1970). Modification of this instrument is made for

the specific needs of the current study. A copy of the resultant questionnaire for measuring

Centralization is presented in the Appendix C. This instrument consists of a list of standard

decisions. To each of these decisions, respondents indicated the level of his or her decision

autonomy. In other words, organizational subjects were asked to respond by indicating

specific organizational level that has the authority to make each of the listed decisions.

Professionalism

The instrument for measuring professionalism is developed from Schoonhoven's

(1981) descriptions, which is based on work by Heydebrand (1973). The two dimensions

of the measure are "initial level of training and the extent to which this training was

supplemented and maintained by current professional activities" (Shoonhoven, 1981:374).

In other words, professionalism is the combination of formal education and professional

training of employees. As such, it can be measured by the average number of years of

formal education and on-job and off-job professional training required to hold jobs in the

specific organization (Daft, 1996). Organizational subjects were asked to respond, using a

seven point Likert type scale, the extent to which they agree or disagree with each item

describing their education and training (Appendix C).

<div align="center">Control Variable.</div>

To enhance the homogeneity of the sample or to control for some external factors

that might affect the relationships being studied, size of the businesses were measured. It

has been suggested in the literature that size of an organization has a direct influence on its

design. By holding organizational size as constant, this study tried to control this

influence. Size of a business were determined by total number of employees. Therefore,

the number of amployees of businesses under this study were hold as constant.

<div align="center">Reliability and Validity of the Measurement Instruments</div>

To provide meaningful results, a study should demonstrate the reliability and

validity of its measurement instruments. Bohrnstedt (1983) described the importance of

establishing the reliability and validity of a measurement instrument by recognizing the

importance of knowing whether or not items measure what they are intended to measure

(Validity) and the degree to which items give a consistent or repeatable result (reliability).

The following section examines whether the newly developed measurement instrument for

customer induced uncertainty meets the accepted reliability and validity measurement

standards.

Reliability

This is an evaluation of measurement consistency. The method of measuring

internal consistency by coefficient alpha (Cronbach, 1951) was used. Two different

methods can be used to calculate the Cronbach's alpha: a variance/covariance matrix or an

evaluation of the average correlations among items in a scale (Nunnally 1978). According

to Nunnally, Cronbach's alpha value of 0.7 is adequate for internal consistency reliability.

As the current research uses a new scale, Nunnally suggested that an alpha value of 0.6 is

acceptable. Accordingly, an alpha value of 0.6 or over are acceptable for this study. The

reliability program in SPSS 8.0 for calculating Cronbach's alpha were used. The intention

of this researcher was to try to identify the combination of items that yields the highest

Cronbach's alpha for each instrument, using the following criteria.

1.	Retain at least three items in each scale in order to cover the construct adequately.

2.	Remove an item only when it does not greatly affect the overall content of the

	scale.

3.	If the removal of an item yields only a slightly better reliability, leave the item in

	the scale.

Following the criterion described above, only those items were retained for validity

analysis that provides an alpha greater than 0.6 for the instrument. Also, items were

deleted if by doing so the overall Cronbach's alpha increased significantly.

Validity

The extensive literature review that provides the basis for the customer induced uncertainty instrument demonstrates content validity of the instrument. Also, a preliminary discussion with 5 managers demonstrate the face validity of the instrument. In other words, the vast literature survey made sure that the instrument covered all the possible contents of the concept that the instrument is trying to measure. Moreover, to the five managers, all the items of the instrument seemed representative of the concept that the instrument is trying to measure. However, the researcher agrees that the degree of content validity is subjective and can always be debated.

Although content validity and face validity are important for a measurement instrument, the most important validity question is whether the test instrument measures the concept it was designed to measure (Kerlinger, 1986). Results of a factor analysis were used to check this construct validity.

This study expected to develop measurement instruments with construct validity. Consistent with the proposition of this study factor analyses results are expected to show items loading on appropriate factors. A few items are expected to be dropped based on how strongly do they load on any factor (Kim & Mueller 1978).

Next chapter presents data analysis results. These include factor analyses, Cronbach's alpha, and regression analysis results. Overarching goal of these data analysis is to present reliable and valid instruments of three aspects of customer induced uncertainty and their relationships with popular design variables.

CHAPTER IV

ANALYSIS OF RESULTS

This chapter provides results of statistical analyses used to test hypotheses

presented in chapter two. In doing so, results of factor analysis for validation of the

developed scales are presented first. Next, results of reliability analysis for newly

developed independent variables as well as previously used dependent variables are

presented. Following the discussion on validity and reliability of variables, descriptive

statistics and regression analysis results are presented.

Data Characteristics

As mentioned in the previous chapter, data were collected on nine variables. Data

on five independent variables were collected on a seven point scale and were considered

continuous. A similar scale was used to collect data on three dependent variables. This

study also used one control variable. Pure numeric data were collected on this variable.

Therefore, on all nine variables used for this study, data were collected in numeric form.

As data were collected on multiple items for all dependent and independent variables. On

each variable mean of the collected data on all items were used for data analysis.

Independent Variables

A factor analysis technique is used to summarize the data and identify the presence of underlying dimensions. Factor analysis is a multi-variate statistical technique. Researchers are increasingly using this technique in all fields of business-related research (Hair, et al., 1998). Basically, this statistical technique is used to analyze relationships among a large number of items and provide their common underlying dimensions. The object is to condense a large number of items into a few factors with a minimum loss of information. The result of the factor analysis can also be used to demonstrate the validity of an instrument.

This study developed three instruments to measure customer induced uncertainty variables. Specifically, these instruments were for measuring customer induced ambiguity, customer importance, and customer acquisitiveness. Factor analysis was conducted as it is an important part of new instrument development. Data were collected on 15, 8, and 5 items to measure customer induced ambiguity, customer importance, and customer acquisitiveness respectively. Before the analysis, it was proposed that customer induced ambiguity consists of three dimensions (involvement, intangibility, and diversity), while customer importance and customer acquisitiveness have only one dimension each (see chapter II).

Factor analyses results for the three instruments are presented in this section. Data collected using each of the instruments were factor-analyzed using a varimax rotation. Table 11 summarizes original and selected items for each factor for the three instruments.

Several rules were used to select specific items for each factor. Although many

researchers suggest a minimum factor loading of 0.3 (Hair, et al. 1998), this study used a

minimum factor loading of 0.4. This makes the retention of items more conservative.

Next, items were removed if they did not offer substantial improvement in the Cronbach's

alpha. Finally, items were removed to avoid problems of cross loading. If an item loaded

substantially on more than one factor, it was removed. Overall, thirteen items were

removed from the three measurement instruments (7 from CIA, 2 from CA, and 4 from

CI; See table 11). Retained items and corresponding factors are presented in appendix D.

Table 11. Summary of Items Omitted from Scales

	Original Number of Items	Final Number of Items
Factor Analysis I For Customer induced Ambiguity	15	8
Involvement	5	2
Intangibility	6	3
Diversity	4	3
Factor Analysis II For Customer Acquisitiveness	5	3
Factor Analysis III For Customer Importance	8	4
TOTAL	28	15

For Customer Induced Ambiguity, results showed only three factors with

eigenvalues greater than or equal to one. The suggestion of three factors in costumer

induced ambiguity is further confirmed by interpreting the relevant scree plot. The three

factor loading with varimax rotation for customer induced ambiguity is shown in table 12.

Table 12 shows that the final items measuring customer induced ambiguity produced

loadings ranging from 0.67 to 0.93. Moreover, these items clearly show discrimination

between factors.

Table 12. Results of Factor Loadings with Varimax Rotation for Customer Induced
Ambiguity

Items	Component		
	Diversity	Intangibility	Involvement
CIU12	**.678**	.136	-.146
CIU13	**.930**	9.969E-02	3.134E-02
CIU14	**.926**	.134	5.180E-02
CIU09	-8.234E-02	**.707**	.185
CIU10	.243	**.856**	4.418E-02
CIU11	.321	**.806**	-9.481E-02
CIU01	4.407E-02	-3.991E-02	**.850**
CIU02	-.107	.183	**.836**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

These three factors appear to represent the three proposed dimensions of customer

induced uncertainty. The items retained for each factor are consistent with the

theoretically developed dimensions, suggesting the presence of construct validity. Two

items loaded on involvement with factor loadings of 0.85 and 0.83 respectively. Three

items loaded on intangibility with factor loadings of 0.7, 0.85, and 0.8 respectively.

Similarly, three items loaded on diversity with factor loadings of 0.67, 0.93, and 0.92

respectively. These high loadings of items together as theoretically proposed, ensure

convergent validity of the instrument. Moreover, with the clear discrimination between

factors, the data provide evidence of discriminant validity.

Next, table 13 shows the extent to which these factors captured the variance of the

proposed instrument of customer induced ambiguity (including all proposed items). As

shown in the table, the three dimensions capture 73 percent of the variance of the original

instrument. This finding further supports the presence of three factors in customer

induced ambiguity.

Table 13. Total Variance of Customer Induced Ambiguity Explained by Components

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.891	36.141	36.141	2.89	36.141	36.141	2.36	29.563	29.563
2	1.694	21.170	57.311	1.69	21.170	57.311	1.96	24.560	54.123
3	1.238	15.469	72.780	1.23	15.469	72.780	1.49	18.657	72.780
4	.707	8.843	81.622						
5	.654	8.171	89.794						
6	.478	5.979	95.773						
7	.244	3.048	98.821						
8	9.434E-02	1.179	100.000						

Extraction Method: Principal Component Analysis.

Finally, table 18 presents Cronbach's alphas for all variables used in this study (see table 18). Cronbach's alphas for the three dimensions of customer induced ambiguity, involvement, intangibility, and diversity, were calculated to be .62, .74, and .82 respectively. According to Nunnally (1978), a Cronbach's alpha of .6 or above is sufficient evidence of reliability for newly developed measurement instruments. Hence, all dimensions of customer induced ambiguity passed the reliability requirement in terms of Cronbach's alpha.

For Customer Acquisitiveness, factor analysis results showed only one factor with an eigenvalue greater than or equal to one. The presence of only one factor is further substantiated with an interpretation of the relevant scree plot. Table 14 shows the factor loadings with varimax rotation for customer acquisitiveness. Factor loading results show the presence of only one factor and each item loaded strongly on that factor. Moreover, it shows that the final items measuring customer acquisitiveness produced loadings ranging from 0.66 to 0.82 confirming a construct validity (Bagozzi, Yi, & Phillips, 1991).

Table 14. Results of Factor Loadings with Varimax Rotation for Customer Acquisitiveness, Component Matrix

Items	Component
	Customer Acquisitiveness
CIU16	**.662**
CIU20	**.827**
CIU23	**.814**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Table 15. Total Variance of Customer Acquisitiveness Explained by Components

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.785	59.488	59.488	1.785	59.488	59.488
2	.745	24.847	84.336			
3	.470	15.664	100.000			

Extraction Method: Principal Component Analysis.

Table 15 show that the variance explained by the apparently single dimension of customer acquisitiveness is almost 60 percent of the original instrument (including all proposed items). This further supports the presence of a single dimension of customer acquisitiveness. Hence, the factor analysis results provide evidence of validity of customer acquisitiveness instrument. Moreover, table 18 shows that the customer acquisitiveness instrument has a Cronbach's alpha of .69 which is well above Nunnally's (1967) suggestion for reliability. Hence the newly developed instrument of customer acquisitiveness contains reliability and validity.

Similar to customer acquisitiveness, the factor analysis results for customer importance show only one factor with an eigenvalue greater than or equal to one. In addition, interpretation of the relevant scree plot clearly indicated the presence of only one factor. Table 16 shows the factor loading with varimax rotation for customer importance. Results of this analysis indicate the presence of only one factor. There were four items measuring customer importance that loaded highly on the same factor. Factor loadings for

customer importance ranged from 0.74 to 0.83, conforming unidimensionality of the

construct. This implies that the measure has high construct validity (Bagozzi, Yi, &

Phillips, 1991).

Table 16. Results of Factor Loadings with Varimax Rotation for Customer Importance,
Component Matrix

Items	Component
	Customer Importance
CIU19	**.792**
CIU22	**.830**
CIU26	**.804**
CIU28	**.748**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

When checked for variance explained by the single factor, table 17 shows that the

single dimension captured 63 percent of the variance of the orginal instrument (including

all proposed items). This, as well as the examination of eigenvalue and scree plot,

confirms the presence of only one dimension of customer importance. This confirms the

validity of the customer importance instrument. A reliability calculation indicates a

Cronbach's alpha of . 79 for customer importance. Therefore, the reliability of this

instrument is also confirmed as its Cronbach's alpha is well above Nunnally's (1978)

recommendation of .6 and above for a newly developed instrument.

Table 17. Total Variance of Customer Importance Explained by Components

Component		Initial Eigenvalues		Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.521	63.037	63.037	2.521	63.037	63.037
2	.678	16.957	79.994			
3	.444	11.100	91.095			
4	.356	8.905	100.000			

Extraction Method: Principal Component Analysis.

Table 18. Reliability Test Results for All Variables (Cronbach's Alphas)

Variable Name	No. of Items	Cronbach's Alpha
Customer Induced Ambiguity Involvement Intangibility Diversity	8 2 3 3	 .62 .74 .82
Customer Importance	4	.79
Customer Acquisitiveness	3	.69
Decentralization	10	.79
Formalization	7	.84
Professionalism	8	.85

Dependent Variables

There are three dependent variables used for this study. Measurement instruments

used for collecting data on these variables were taken from the existing literature. These

instruments have been used in many organizational studies. As the validity of these

instruments were previously established, this study did not make any attempt to further

test their validity.

Although existing instruments were used to collect data on these variables, items

were customized to fit this study. As the wordings of some of the items were changed to

fit this particular study, reliability tests become almost necessary. Table 18 presents the

Cronbach's alpha on each of these three dependent variables. Cronbach's alpha ranged

from 0.79 to 0.85 which is well within the recommendation of Nunnally for the reliability

of already developed measurement instruments.

Regression Analysis Results

Regression analysis can be used for predicting criterion (dependent) variables from

a collection of predictor (independent) variable values (Hair, et al. 1998). In other words,

this statistical methodology can be used to assess the influence of independent variables on

dependent variables. This study uses multiple regression models for predicting design

variables. However, it is recognized that finding a significant relationship with regression

analysis does not ensure a knowledge of causality. As such, the intent of this study is

simply to show the relationships between customer induced uncertainty variables and

specific design variables. Moreover, for the applicability of multiple regression techniques

the data should meet several assumptions. The following sections describe prominent

features of data with descriptive statistics, suggestions of relationships with

intercorrelations between variables, the standard assumptions for multiple regression analysis, and regression analysis results.

Descriptive Statistics

After collecting sets of data for different measures, the data were summarized and quantified to describe prominent features. Data were analyzed for the measures of central tendency and dispersion, which belong to the category of descriptive statistics. Descriptive statistics help the researcher summarize the general nature of the study variables.

In compliance with the above recommendation, descriptive statistics are presented in Table 19 to summarize the collected data. Descriptive statistics in this study include measures of central tendency and measures of variability. By calculating central tendency researchers can obtain an easily interpreted description of the "typical" or "average" value for each measure. For this study measures of central tendency are represented by the mean. By calculating variability, researchers can decide if subjects vary on certain variables and the extent to which they vary. The obvious questions this variability leads researchers to ask are "why do some subject score high and some low on certain variables?" and "what accounts for such variability?" Maximum, minimum, and standard deviation are often used as measures of variability and this study is not an exception in this regard.

It is important, however, to present the data characteristics for clear understanding

of the descriptive statistics. As presented in table 21, all variables used in this study are

presumed to be continuous variables. Data on the five independent variables

(involvement, intangibility, diversity, customer acquisitiveness, customer importance) were

collected on a 7 point scale. Higher the number on that scale lower would be the value of

the specific variable. Different scales were used to collect data on dependent variables .

For decentralization, data were collected on a 0 to 5 scale, where a higher number

represents a higher value for decentralization. For formalization data were collected on a

1 to 5 scale, and similar to decentralization, a higher number represented a higher value for

formalization. Finally, data on professionalism were collected on a 1 to 7 scale and in

contrast to decentralization, a higher number represented a lower value for

professionalism.

Table 19. Descriptive Statistics

Variable Name	N	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic
Acquisitiveness (AQ)	118	1.33	6.67	4.1581	1.0685
Importance (IM)	118	1.00	7.00	2.7436	1.1980
Involvement (INV)	118	1.00	7.00	3.3432	1.5173
Intangibility(INT)	118	1.00	7.00	2.0678	1.1201
Diversity (DVR)	118	1.00	7.00	3.1751	1.4039
Decentralization (DEC)	118	1.20	5.00	2.8983	.6173
Formalization (FOR)	118	1.00	5.00	3.8477	.8307
Professionalism (PRO)	118	1.00	6.50	4.0269	1.1490
Number of Emp. (EMP)	118	43.00	12000.00	430.1186	1275.7535

The five independent variables (three dimensions of customer induced ambiguity, customer acquisitiveness and customer importance) produced a minimum and a maximum of 1 and 7. Standard deviations and means of these variables ranged from 1.06 to 1.52 and 2.06 to 4.15 respectively. This suggests that organizations vary greatly on each customer induced uncertainty variable. Also, on average, organizations were faced with higher intangibility (a dimension of customer induced ambiguity) and customer importance than customer acquisitiveness, involvement, and diversity. However, except for customer acquisitiveness, all other customer induced uncertainty variables produced higher than the neutral score.

The three dependent variables used for this study produced means ranging from 2.89 to 4.02 and standard deviation ranging from 0.61 to 1.14. Therefore, on average, respondent organizations are low on decentralization, a little high on formalization and almost neutral on professionalism. However, these organizations do vary on these variables.

Intercorrelations Between Variables

The intercorrelations between all variables used in this study are presented in table 21. The table shows the pearson correlation between all variables and, within parenthesis, it shows the two tailed significance level. As there are a few significant correlations between independent variables, there is a concern about problems of multicollinearity. Multicollinearity concerns are addressed in the regression assumption section of this chapter.

Table 20. Intercorrelations Between Variables

Variables	INV	INT	DIV	IM	AQ	EMP	DEC	FOR
INT	.140 (.12)							
DIV	-.076 (.414)	.306*** (.001)						
IM	.267*** (.003)	.501*** (.000)	.182** (.04)					
AQ	.088 (.34)	.038 (.68)	-.014 (.88)	.195** (.03)				
EMP	.059 (.52)	.099 (.28)	.146 (.11)	-.061 (.51)	-.173* (.06)			
DEC	.128 (.16)	-.051 (.58)	-.185** (.04)	.004 (.96)	.114 (.22)	-.124 (.18)		
FOR	.026 (.77)	-.034 (.71)	-.078 (.39)	-.048 (.60)	.241*** (.009)	.015 (.87)	.137 (.13)	
PRO	-.016 (.86)	.082 (.37)	.078 (.39)	.200** (.03)	-.085 (.36)	-.161* (.08)	-.112 (.22)	-.294*** (.00)

*** Correlation is significant at the 0.01 level (2-tailed).
** Correlation is significant at the 0.05 level (2-tailed).
* Correlation is significant at the 0.1 level (2-tailed).

Regression Assumptions

Although multiple regression models are based on many important assumptions, in most circumstances regression analyses are so robust that the results of such analysis are still valid even if all assumptions are not fully met (Hair, et al., 1998). Data collected on all the variables used in this study were checked to see if all assumptions were met. Variance inflation factor (VIF) was used to test for multicolliniarity. VIF values for all independent variables were found to be less than 2, which is well below the

multicolliniarity level of 10. Assumptions of linearity and homogeneity were confirmed by showing random distributions in scree plots of residuals plotted against predicted values. Furthermore, the assumption of equality of variance was also confirmed as the spread of residuals did not decrease or increase with predicted values or with the value of independent variables.

Data on the independent and dependent variables were collected using Likert type scales. As a vast majority of the literature in organizational theory has traditionally considered data based on Likert scales as continuous, data that were collected on the dependent as well as independent variables for this study were considered as continuous. Therefore, as most regression assumptions were met, multiple regression analysis was deemed appropriate to use to analyze the data for this study.

Hypotheses Testing

For testing the hypotheses developed in this study, three multiple regression analyses were performed using the three customer induced uncertainty variables as independent variables with formalization, centralization, and professionalism respectively as dependent variables. Table 21 summarizes the names of variables, types of variables, and symbols used for this study and Table 22 presents the regression models used for testing specific hypotheses.

Table 21. Variables Used in the Study.

No	Variable Names	Variable Types	Symbols
1	Customer induced ambiguity (CIA)	Independent Variable (Continuous)	X1A, X1B, X1C
	Involvement	Dimension of CIA	X1A
	Intangibility	Dimension of CIA	X1B
	Diversity	Dimension of CIA	X1C
2	Customer importance	Independent Variable (Continuous)	X2
3	Customer acquisitive behavior	Independent Variable (Continuous)	X3
4	Formalization	Dependent Variable (Continuous)	Y1
5	Centralization	Dependent Variable (Continuous)	Y2
6	Professionalism	Dependent Variable (Continuous)	Y3
7	Number of Employees	Control Variable (Continuous)	X4

All together twelve regression models were used for testing hypothesized relationships. Three models (I, II, and III) were used to test hypothesized relationships between customer induced uncertainty variables and decentralization (H1a, H1b, and H1c). Similarly, two sets of three models (IV, V, VI and VII, VIII, IX) were used to test hypothesized relations of customer induced uncertainty variables with formalization and with professionalism. Finally, three models (X, XI, and XII) were used to test the combined influence of customer induced ambiguity (X1A-Involvement, X1B-Intangibility, X1C-Diversity), Customer importance (X2), and Customer acquisitiveness (X3) on

Formalization (Y1), Decentralization (Y2), and Professionalism (Y3) respectively. Based

on these twelve models, regression analysis was conducted keeping number of employees

as a control variable.

Table 22. Proposed Hypotheses and Corresponding Regression Equations

Model	Regression Equation	Hypotheses
(I)	Y1 = a + b1X1A+b2X1B+b3X1C+b4X4 + e	H1a
(II)	Y1 = a + b1X2 + b2X4 + e	H1b
(III)	Y1 = a + b1X3 + b2X4 + e	H1c
(IV)	Y2 = a + b1X1A+b2X1B+b3X1C+b4X4 + e	H2a
(V)	Y2 = a + b1X2 + b2X4 + e	H2b
(VI)	Y2 = a + b1X3 + b2X4 + e	H2c
(VII)	Y3 = a + b1X1A+b2X1B+b3X1C+b4X4 + e	H3a
(VIII)	Y3 = a + b1X2 + b2X4 + e	H3b
(IX)	Y3 = a + b1X3 + b2X4 + e	H3c
(X)	Y1 = a + b1X1A+b2X1B+b3X1C+b4X2+b5X3+b6X4 + e	H4a
(XI)	Y2 = a + b1X1A+b2X1B+b3X1C+b4X2+b5X3+b6X4 + e	H4b
(XII)	Y3 = a + b1X1A+b2X1B+b3X1C+b4X2+b5X3+b6X4 + e	H4c

Relationships Between Decentralization and Customer Induced Uncertainty

Variables. Hypotheses H1a through H1c examined the relationships between customer

induced uncertainty variables and decentralization. Regression analysis results for model

one (shown in table 23) indicate that the overall model is not significant ($\propto$ = 0.13) and

thus H1a was not supported. However, among the three dimensions of customer induced

ambiguity, diversity is related to decentralization at 0.08 significance level. Moreover, as

predicted, results show a negative beta for diversity. This finding is also supported by the

correlation matrix, which shows a significant ($\propto = 0.04$) negative correlation between

decentralization and diversity. But since a higher score indicated lower diversity, a

negative data correlation means a positive relationship between decentralization and

diversity.

Table 23. Regression Analysis Results, Decentralization as Dependent Variable

Model	DV	IV	Beta			R²	F
I	Y2	X1A, X1B, X1C	b1	b2	b3	4.7%	1.9 (.13)
			.11 (.21)	-.01 (.87)	-.17 (.08)		
II	Y2	X2	.14 (.13)			3.5%	2.05 (.13)
III	Y2	X3	-.002 (.979)			1.5%	0.89 (.41)

Results of models II and III show no significant relationships. The overall

significance level of model II is 0.13 and that of model III is 0.4. Furthermore, individual

betas are not significant and the correlation matrix does not show any significant

correlation between customer acquisitiveness and decentralization or between customer

importance and decentralization. Thus, hypotheses H1b and H1c were not supported.

Relationships Between Formalization and Customer Induced Uncertainty variables.

Regression models IV, V, and VI test relationships between customer induced ambiguity

and formalization, between customer acquisitiveness and formalization, and between

customer importance and formalization respectively (see Table 24). Regression analysis

results for model IV show a nonsignificant F statistic ($\propto = 0.9$). Moreover, individual t

statistics for the three dimensions of customer induced ambiguity are also nonsignificant

($\propto = 0.8$, $\propto= 0.8$, and $\propto= 0.4$). Therefore, the regression results show that neither

customer induced ambiguity as a whole nor any of its dimensions are significantly related

with formalization. Hence, hypothesis H2a is not supported by the data analysis. A

similar examination of the results of regression model V show that hypothesis H2b is not

supported.

Data analysis results of regression model VI, however, show a significant F

statistic ($\propto= 0.02$) with a positive beta associated to the independent variable and an R^2 of

0.062. While producing a positive beta, these results actually indicate the presence of a

negative relationship between customer importance and formalization. For the customer

importance scale, the lower the number the higher is the customer importance. In contrast,

on the formalization scale, a higher number means higher formalization. Therefore, a

positive relationship of these data indicates a negative relationship between customer

importance and formalization. Hence, hypothesis H2c is supported.

Table 24. Regression Analysis Results, Formalization as Dependent Variable

Model	DV	IV	Beta			R²	F
IV	Y1	X1A, X1B, X1C	b1	b2	b3	.7%	.21 (.93)
			.02 (.82)	-.01 (.87)	-.07 (.45)		
V	Y1	X2	-.04 (.61)			.2%	.13 (.87)
VI	Y1	X3	.25 (.007)			6.2%	3.7 (.02)

<u>Relationships Between Professionalism and Customer Induced Uncertainty variables.</u>

Regression models VII, VIII, and IX test relationships between the variables of customer induced uncertainty and professionalism. Regression analysis results for model VII, that tests the relationship between dimensions of customer induced ambiguity and professionalism, shows a nonsignificant F statistic ($\propto = 0.29$). Moreover, individual t statistics for the three dimensions of customer induced ambiguity are also nonsignificant ($\propto = 0.9$, $\propto = 0.4$, and $\propto = 0.4$). Hence, hypothesis H3a is not supported.

A similar examination of the results of regression model VIII, that tests the relationship between customer importance and professionalism, shows a significant F statistic ($\propto = 0.02$) with a positive beta associated with the independent variable and an R² of 0.066. Data on customer acquisitiveness indicate that, the lower the number, the higher is the customer acquisitiveness. Similarly, data on professionalism indicate that the lower the number, the higher is professionalism. Therefore, a positive beta indicates a positive relationship between customer acquisitiveness and professionalism: as customer

importance increases, so does the level of professionalism. Hence, hypothesis H3b is supported.

Results of regression model IX, that tests the relationship between customer acquisitiveness and professionalism, show a nonsignificant overall F statistic ($\propto= 0.12$), with a nonsignificant beta associated with the independent variable. These results do not indicate the presence of the proposed relationship between customer acquisitiveness and professionalism, and thus hypothesis H3c was not supported.

Table 25. Regression Analysis Results, Professionalism as Dependent Variable

Model	DV	IV	Beta			R^2	F
VII	Y3	X1A, X1B, X1C	b1	b2	b3	4.2%	1.23 (.29)
			.003 (.97)	.081 (.41)	.08 (.42)		
VIII	Y3	X2	.2 (.03)			6.6%	3.99 (.02)
IX	Y3	X3	-.10 (.28)			3.6%	2.11 (.12)

<u>All Customer Induced Uncertainty Variables and Design Relationships.</u>

Regression models X, XI, and XII test the relationships of all customer induced uncertainty variables taken together with decentralization, formalization, and professionalism respectively. These models were used to test if all the customer induced uncertainty variables taken together explain the variation in each of the design variables

used in the study better than any one customer induced uncertainty variable taken separately.

Model X tests the relationship between all customer induced uncertainty variables and decentralization. Results of regression model X show a nonsignificant F statistic. Although the R^2 is more than all of the models that examined individual customer induced uncertainty variables and decentralization, this increase is not significant. Moreover, the R^2 of a model always increases with an increase in the number of independent variables (even if they are not related with the dependent variable). Therefore, it can be concluded that all customer induced uncertainty variables, when taken together, did not explain decentralization better than when they were taken separately. Hence, hypothesis H4a was not supported.

Model XI, tests the relationship between all customer induced uncertainty variables taken together and formalization. Results of this model show a non significant F statistic. Similar to model X, even though the R^2 of this model is higher than that of all the models that test relationships between individual customer induced uncertainty variables and formalization (Models IV through VI), this increase in R^2 is not significant. Therefore, model XI shows that all customer induced uncertainty variables, when taken together, did not explain formalization more than when they were taken separately, and hypothesis H4b was not supported.

Model XII tests relationships between all customer induced uncertainty variables taken together and professionalism. This model shows an overall F statistic that is not

significant at $\propto = 0.05$. Similar to the other two models (X and XI), even though the R^2 of this model is higher than that of all the models that test relationships between individual customer induced variables and professionalism (Models VII through IX), this increase in R^2 is not significant. Accordingly, model XII indicates that together, all customer induced uncertainty variables do not explain formalization more than any individual variables taken separately, and like H4a and H4b, H4c was also not supported.

Table 26. Regression Results, All Customer Induced Uncertainty Variables are Present as Independent Variables

Model	DV	IV	Beta					R^2	F
X	Y2	X1A, X1B, X1C, X2, X3	b1	b2	b3	b4	b5	6%	1.4 (.22)
			.11 (.25)	-.01 (.92)	-.17 (.07)	-.005 (.96)	.10 (.27)		
XI	Y1	X1A, X1B, X1C, X2, X3	b1	b2	b3	b4	b5	7.5%	1.4 (.19)
			.017 (.85)	.01 (.92)	-.056 (.57)	-.89 (.37)	.27 (.006)		
XII	Y3	X1A, X1B, X1X, X2, X3	b1	b2	b3	b4	b5	9%	1.8 (.10)
			-.03 (.70)	-.02 (.82)	.07 (.48)	.23 (.04)	-.14 (.14)		

Summary

The core of this empirical study was to develop measurement instruments for three aspects of customer induced uncertainty; customer induced ambiguity, customer acquisitiveness, customer importance. Further, it sought to determine relationships

between aspects of customer induced uncertainty and specific design variables. Results of data analyses in the form of factor analysis and regression analysis were presented in this chapter. Factor analysis results supported the presence of variables with the proposed dimensions. Thus, this study provides newly developed instruments to measure aspects of customer induced uncertainty with acceptable validity and reliability.

Regression results suggested relationships between specific aspects of customer induced uncertainty and design variables. Although the majority of specific hypotheses were not supported, regression analysis show statistically significant relationships between diversity (a dimension of customer induced ambiguity) and decentralization, between customer importance and formalization, and between customer acquisitiveness and professionalism. These suggest specific rather than general relationships between customer induced uncertainty variables and design options.

Among the specific hypothesized relationships H2c and H3b were clearly supported. Moreover, although diversity seemed related to decentralization, customer induced ambiguity as a whole was not significantly related to decentralization. However, the suggestion of a relationship between customer induced ambiguity and decentralization was discussed with additional data analysis results. This discussion along with implications of these findings are addressed in the next chapter.

CHAPTER V

DISCUSSION OF RESULTS

Overall, this study extends our understanding of environmental uncertainty. Focusing on the increasing complexity of customers as a contemporary environmental factor, measures of customer induced uncertainty variables are developed. With a comprehensive theoretical foundation the measure provides an understanding of the determinants of customer induced uncertainty. To broaden the knowledge and to examine the importance of this uncertainty, its effects on organizational design variables are demonstrated. Besides providing a clear understanding of a critical type of task uncertainty, this study provides a measurement instrument that can be used for future studies and demonstrates that customer induced uncertainty can also be used to explain organizational design.

Measurement Instrument Development

The primary focus of this study was to develop the theoretical underpinnings and provide measurement instruments for different aspects of customer induced uncertainty. The study was successful in achieving this goal. Based on the existing literature, three distinct aspects of customer induced uncertainty were proposed. Instruments were

successfully developed for the three aspects of customer induced uncertainty: customer induced ambiguity, customer acquisitiveness, and customer importance.

Factor analysis results supported the existence of predicted number of the factors. Item loadings confirmed that the proposed items loaded together on the appropriate factors and there were no cross loadings. This suggests both convergent and discriminant validity of the new measurement instruments. Further, reliability analysis for the newly developed instruments for measuring the three aspects of customer induced uncertainty showed acceptable levels of Cronbach's alphas. Being at par with Nunnally's reliability recommendation for newly developed measurement instruments, these three variables produced Cronbach's alphas of 0.68, 0.69, and 0.79 respectively. Therefore, it can be concluded that this study was successful in its endeavor to develop measurement instruments for the three customer induced uncertainty variables.

In addition to the development of these measurement instruments, a related objective of this study was to examine the relationships between customer induced uncertainty variables and organizational design variables. To do so, three popular design variables, decentralization, formalization, and professionalism, were used. The following section discusses the results of the hypothesized relationships between customer induced uncertainty variables and organizational design. This includes discussion of possible reasons for the support or the lack of support for specific hypotheses.

Discussion of Hypothesized Results

Hypotheses testing results of this study suggested the existence of relationships between customer induced uncertainty and organizational design. The way customer induced uncertainty was related to organizational design, however, depended on the specific variables used in the relationships. While primary data analysis results did not show support for all hypothesized relationships, results provided enough evidence to point out contingency relationships between customer uncertainty variables and organizational design.

Relationships with Formalization

Among the three predicted relationships (H2a, H2b, and H2c) between customer induced uncertainty variables and formalization, only one relationship was clearly supported by data analysis. The data analysis results show a statistically significant negative relationship between formalization and customer acquisitiveness. This suggests that organizations that face increasing customer acquisitiveness also reduce the use of formalization. However, organizations do not necessarily adjust formalization when they are faced either with customer induced ambiguity or with customer importance.

Customer acquisitiveness addresses how easy it is for customers to take advantage of the organization and how profitable it is for customers to engage in acquisitive behaviors as opposed to cooperative behaviors. Thus, higher customer acquisitiveness means a higher possibility of customers taking advantage of the organization. However,

this does not guarantee that all customers will take advantage of the organization. In other words, higher customer acquisitiveness does not confirm whether or not any particular customer will actually engage in acquisitive behavior.

Given this, the reason for formalization, which looks at the written rules, policies, and procedures used by organizations to standardize organizational activities, to show a negative relationship with customer acquisitiveness is clear. Since high customer acquisitiveness only suggests a high possibility of customers taking advantage, but does not confirm which customer would actually take advantage, organization facing this must be able to adjust their activities to different customers. In other words, if an organization faces high customer acquisitiveness, it cannot treat all customers similarly since it perceives that some customers will actually engage in acquisitive behavior while others will not. Such organizations need to increase the flexibility of those who interact with customers by decreasing the use of rules, policies, and procedures. Hence, customer acquisitiveness showed a negative relationship with formalization.

Customer induced ambiguity and customer importance, on the other hand, did not show any relationships with formalization. There could be more than one reason for the non significance of these relationships. Because of the similarity of the rationale in all of the non significant findings, discussion will be held until after all of the significant relationships have been presented.

Relationships with Decentralization

None of the hypothesized relationships between decentralization and the three

customer induced uncertainty variables were directly supported in the regression models.

In spite of the lack of direct support for these hypotheses though, data analysis results did

point to a possible relationship between customer induced ambiguity and decentralization.

For example, although decentralization was not found significantly related with customer

induced ambiguity, the significance level was not too far from the conventional level

($\propto$=.13). More importantly, results show that decentralization is related to diversity, one

of the dimensions of customer induced ambiguity, at a statistical significance level of 0.08.

The intercorrelations matrix (see table 20) also shows the existence of a significant

($p \leq .05$) negative correlation between decentralization and diversity. Moreover, the

regression analysis results show two of the three dimensions (intangibility and diversity)

produced betas consistent with the hypothesized direction.

While by no means conclusive, these results do suggest a possible relationship

between Customer induced ambiguity and decentralization. The choice to decentralize,

however, is also likely to depend on other factors. For example, an organization would

prefer its lower level employees to be well trained if it is going to provide them with the

higher level of authority associated with decentralization. In terms of the current study, it

could be argued that organizations with high professionalism might be more likely to

respond to customer induced uncertainty variables, including customer induced ambiguity,

with decentralization. Accordingly, additional analysis was conducted to test relationships

between decentralization and customer induced uncertainty variables for only those organizations that scored higher than average on professionalism.

Results of the additional analysis testing the relationship between customer induced ambiguity and decentralization show that all three dimensions of customer induced ambiguity have produced betas consistent with the hypothesized direction. Also, the R^2 of the model showed an increase from 4.7% to 6.9% and the significance level of diversity decreased from .08 to .04. In other words, results suggest that organizations that utilize high professionalism tend to respond to customer induced ambiguity with decentralization. Specifically, diversity, as one of the dimensions of customer induced ambiguity, and decentralization were significantly related for those organizations that utilize high professionalism. These results indicate support for the above argument for a relationship between customer induced ambiguity and decentralization. However, results of the original and the additional data analysis did not indicate support for the hypothesized relationships between any other customer induced uncertainty variables and decentralization.

Suggestion of a relationship between customer induced ambiguity and decentralization makes sense, as organizations that are highly involved with their customers, deal with a high proportion of intangibles, and have highly diverse customers might be better off being decentralized. Organizations without adequate authority at the lower levels would have difficulty to maintain high level of involvement. Generally, customers would like to remain involved as long as they think the people they are so

involved with have the ability to make adequate decisions. However, an increase in professionalism or a decrease in formalization might not be necessary for maintaining a high level of involvement. That is, customers might not mind being involved even if employees are not professionally trained and if the organization uses standardized rules, policies and procedures, as long as employees can make some decisions.

As interactions involving intangibility and diversity require perceptual understanding, information regarding these gets distorted as they travel up through the lines of authority. Also, neither professionalism nor lower formalization would eliminate this distortion, as it is possibly caused by the perceptual nature of the communication. Therefore, like increased involvement, increased intangibility and diversity might also call for decisions to be made at the point of contact. Therefore, by allowing authority to the lower levels, decentralization is probably the most closely related to customer induced ambiguity.

Relationships with Professionalism

For the tests examining the relationships between customer induced uncertainty variables and professionalism, only the hypothesized relationship between professionalism and customer importance was clearly supported by data analysis results. Results show a statistically significant positive relationship between customer importance and professionalism. This indicates that organizations facing high customer importance responded with high professionalism. However, tests for relationships of professionalism

with customer acquisitiveness and with customer induced ambiguity produced non significant results.

Possible arguments can be made for these findings. Among the three design options used in this study, organizations might find it most appropriate to adjust professionalism to encounter customer importance. Organizations do not adjust professionalism to respond to either customer acquisitiveness or customer induced ambiguity. As customer importance depends on the value and non transferability of assets used for typical customers, organizations faced with high customer importance might realize that professionalism is very important to interact effectively with such customers. Organizations need to make sure that the employees are professionally trained when they mostly deal with customers that require valuable and non transferable assets. Professional training is important, because every mistake would be costly to the organization.

An increase in professionalism, however, may not be necessary for organizations faced with customer acquisitiveness and customer induced ambiguity. If the existing rules and policies allow customer acquisitiveness, increasing professionalism would not help. Similarly, if organizational customers are involved, deal with intangibles, and are diverse, professionally trained employees might not be necessary, as it is not professionalism but the authority to make decisions regarding complex customer interactions that is important. Therefore, professionalism is more important for organizations faced with customer importance than it is for organizations faced with customer acquisitiveness or with customer induced ambiguity.

Relationships of Design Options with All Customer Induced Uncertainty Variables

When tested for the ability of all customer induced uncertainty variables taken together to explain changes in each of the three design variables, none of the models showed significant result. This suggests that customer induced uncertainty variables in combination do not explain the changes in design variables more than they do individually. Further examination of the results of these combined regression models (see Table 26), shows that even though the overall models were not significant, the t-statistics for diversity, is significant where the dependent variable is decentralization. Similarly, t-tests for customer acquisitiveness and customer importance were significant where the dependent variables are formalization and professionalism respectively. These findings supports the above observations that instead of a general relationship, customer induced uncertainty variables might have specific relationships with specific design variables.

Non Supported Hypotheses

In general, there could be many possible reasons for not finding support for some of the hypothesized relationships. For example, the nature of the data used for these tests is one of the major limitations of this study and also could be a major cause for not finding support for hypothesized relationships. This study used the same data for scale development and hypothesis testing. It is recommended that, after a valid and reliable scale is developed, fresh data should be collected to test relationships with other variables.

Another possible cause is the power of statistical tests. Post hoc power analysis

results showed very low powers for all statistical tests that did not support hypothesized

relationships (see table 27). With low power a statistical test might lose its ability to find a

relationship even if there is actually a relationship.

Table 27.   F-test in Multiple Regression, post hoc Analysis, Accuracy Model (Alpha set
at .05)

Models (N=118)	Effect Size f²	Critical F	# of Predictor	Power
I	.049	F(4, 113)= 2.45	3+1	.440
II	.036	F(2, 115) = 3.07	1+1	.430
III	.015	F(2, 115) = 3.07	1+1	.200
IV	.007	F(4, 113)= 2.45	3+1	.093
V	.002	F(2, 115) = 3.07	1+1	.067
VI	.062	F(2, 115) = 3.07	1+1	.700
VII	.043	F(4, 113)= 2.45	3+1	.390
VIII	.070	F(2, 115) = 3.07	1+1	.720
IX	.037	F(2, 115) = 3.07	1+1	.440

However, a low post hoc power could be the result of a very small effect size,

which is true for most non significant relationships of this study. Accordingly, it is

possible that if the power is increased with a very large sample size, the statistical test

could pick up practically insignificant relationship. Therefore, a very important reason for

not finding support for hypothesized relationships is that some of the hypothesized relationship might not actually exist. As results indicated, studied organizations might have adjusted a specific design option out of the three used in this study to respond to each customer induced uncertainty variable.

Following Galbraith (1973), it can be argued that organizations have many design options for responding to uncertainty and they don't have to adjust all design options at the same time to protect against uncertainty. In other words, an organization facing uncertainty can choose to reduce formalization but not to use decentralization. Similarly, an organization can choose to increase professionalism but not decentralization. Accordingly, an organization that faces high customer importance might choose to increase professionalism but not to adjust decentralization or formalization, another organization that faces high customer acquisitiveness might choose to decrease formalization but not to adjust decentralization or professionalism, and yet another organization that faces a high customer induced ambiguity might chose to increase decentralization but not to adjust formalization or professionalism.

This argument can also be substantiated with the assertion from Sharfman and Dean (1991), that environmental dimensions are independent of each other. An increase in the uncertainty of one dimension does not in any way mean an increase in the uncertainties on the other dimensions.   Thus, it is possible that, depending on the type of uncertainty they face, organizations opt to adjust specific design variables, and this might be the reason that some of the hypothesis were supported and some were not.

Summary

  While all the hypothesized relationships were not supported, data analysis results clearly suggested contingency relationships between customer induced uncertainty variables and different design options. Results suggested that each variable of customer induced uncertainty is related to at least one design option. Moreover, the way in which a design option is related to a specific customer induced uncertainty variable depended on the specific variables used for the test.

  The intent of this study, however, as noted in chapter two, was not to provide a definitive answer as to what particular design variables an organization should adjust to respond to customer induced uncertainty. Instead, following the suggestions of established contingency relationships between uncertainty and organizational design, somewhat generic arguments were made for why and how customer induced uncertainty variables would be related to specific design variables. While the results clearly indicate relationships between variables of customer induced uncertainty and organizational design, they also suggest that further theoretical and empirical work is necessary to understand the exact nature of these relationships.

<div align="center">Limitations and Future Research Agenda</div>

  While the results of this study should make valuable contributions to both research and business practice, the study is not free from limitations. Possible limitations center around the nature of the data used for this study. Specifically, these limitations include

generalizability problems, survey response bias, and common method variance in testing hypotheses. The following discussion addresses the nature of these limitations and steps taken to minimize them.

Generalizability

The sampling plan for this study called for a random sampling from a convenience sampling frame, where the sampling frame was a mailing list generated by a professional organization. As the data for this study was not collected from a true random sample, the findings cannot be ideally generalizable to the entire population of organizations.

However, researchers agree that it is often futile to try to find a truly random sample. Instead, it is sometimes wise to use a combination sampling design (Babbie, 1990) like the one for this study. As this study identified concepts that are relevant for all organizations that have identifiable customers, ideally it would have required a master list of managers for all organizations, limited only by this study's preset organizational size (number of employees). As the author could not find any such list, the use of a general mailing list from a well recognized organization was a reasonable compromise. Still, caution should be used when generalizing the current results beyond the sample used here.

Response Bias

As customer induced uncertainty is measured using self-reported data, one can expect some biases in the measure that are usual with this type of data. However, it can be

argued that the construct uncertainty itself is self-developed by managers. In other words, the uncertainty faced by organizations depends on managers' perceptions. Therefore, self-reported data from managers represent the actual uncertainty faced by managers and by their organization.

Common Method Variance

Another concern is the possibility of common method variance. Common method variance is a threat for studies that use the same subjects for independent as well as dependent variables. A chance of common method variance always arises when information for a study is gathered using self-reports (Podsakoff & Organ, 1986). Unfortunately, there is no recognized standard recommendation available for eliminating common method variance. This study took steps recommended in the literature to avoid this problem as much as possible. For example, the questionnaire used different scales for measuring different constructs. Also, both positive and negative items were used to measure individual constructs. Although these measures do not eliminate the possibility of common method variance, they might reduce its impact. Hence, the findings of this study might be influenced by common method variance. Therefore, caution should be used to interpret the findings of this study as some of the findings might be influenced by common method variance.

Suggestions for Future Research

At the outset, this study provides useful measurement instruments for future studies. These instruments can be used to examine a variety of relationships based on contingency theory. In general, these would be useful tools for future studies to examine relationships between customer induced uncertainty variables and a variety of organizational variables such as organizational design variables, strategy types, leadership types etc.

Specifically, a natural extension of this study would be further examination of relationships between customer induced uncertainty and design variables. While some possible rationales have been offered in this study as to what design variable should be related to what customer induced uncertainty variable and why, additional work based on theoretical and empirical research is needed to pin down the exact relationships between these variables. In addition, design variables other than those used here should also be considered in this examination. Logically, the five design options that Galbraith (1973) called modern design variables can be examined to see how they are related to customer induced uncertainty variables.

With the increase in customer-invasion in contemporary and future organizations, more and more modern organizations will be faced with an increase in one or multiple aspects of customer induced uncertainty. Hence, modern organizations need to comprehend the type and level of customer induced uncertainty they face and determine appropriate design options that will allow them to effectively manage it. Emerging designs

of twenty-first century organizations are often characterized as being networked, flat, flexible, diverse, spherical, cellular, virtual etc. As modern organizations are most likely to face increasing customer induced uncertainty, it would be useful for both practice and theory to examine the appropriateness of specific organizational forms for specific types of customer induced uncertainty.

Moreover, with a measure of customer induced uncertainty, it would also be possible to compare and contrast the effect of existing measures of task uncertainty with that of customer induced uncertainty on organizational activities. It would be useful to examine how traditional task uncertainty and customer induced uncertainty variables together influence organizational activities. It would be interesting, for example, to see if together customer induced uncertainty and traditional task uncertainty explain the changes in the organizational variables better than either of them separately. Such studies could help uncover the appropriate placement of customer induced uncertainty with traditional task uncertainty, examining them separately and together for their individual and combined influence on organizational activities to extend our knowledge of fit between uncertainty and organizational activities.

Finally, with further refined measures future studies may extend models examined in this study by including an outcome variable such as organizational performance. It would be useful to examine the kinds of fit between customer induced uncertainty and organizational activities of those organizations that perform better as opposed to those that perform poorly. This would provide evidence of the real contingency relationships

between design variables and customer induced uncertainty variables, as contingency relationships provide the fit between uncertainty and design that produce higher performance. To farther demarcate the specific relationships between aspects of customer induced uncertainty organization design, more control variables in addition to organizational size could be used. For example organizational age is also shown to have relationship with design, therefore, age could also be used as a control variable.

Conclusion

The primary purpose of this research undertaking was to add to the present body of knowledge on environmental uncertainty. This study focused on particular uncertainty issues that are increasingly becoming important for contemporary organizations, and has provided theoretical understanding and empirical results for scholars who are theorizing about contemporary organizational phenomena. Specifically, theoretical explanation of the existence of customer induced uncertainty variables are presented. Moreover, by developing instruments for measuring customer induced uncertainty variables that have contemporary importance, this study provided tools for further understanding of environmental phenomenon.

Furthermore, this study indicated possible specific connections between customer induced uncertainty variables and organization design variables. It provides the rudimentary foundation for comprehensive understanding of the nature of the relationships between customer induced uncertainty variables and individual design options. Hence, it

provides the promise of enriching the environment and design contingency relationship based on contemporary business phenomena. Future scholars who wish to explore such relationships should not base their work only on traditional uncertainty and organizational design contingency theory. Rather they should take a closer look at the specific nature of individual customer induced uncertainty variables. By doing so, scholars would be able to explain specifically which design variable is related to which uncertainty variable and why. In general, results from this study can be used as a foundation for advancing our knowledge of customer induced uncertainty and it's relationship with contemporary organizational design.

APPENDIX A

FIRST LETTER

[Name]
[Organization]
[Street Address]
[City, State, Zip]

Dear [Name]:

How does your effort to serve customer well can influence your performance? Are your customers creating task uncertainty to your organization? What kind of task uncertainty are they creating in your organization? How should you design your organization to encounter this uncertainty? You hold valuable information to answer these questions.

Enclosed you will find a questionnaire that will help answer these questions. Although this is a unique and valuable study, ***considering your busy schedule, I designed the questionnaire so that it is easy to complete and takes about ten minutes to complete. I assure you that your responses will be held in complete confidence.***

Your participation is very important. You are selected as one of the very few representatives of your industry. ***Unfortunately, even if only a few individuals choose not to participate, that might turn the success into a failure of the research that has taken literally years to formulate***. Please do not underestimate the value of you participation!

In appreciation of your participation, ***I would offer an executive summary of the study findings***. Please send a copy of your business card along with completed questionnaire in the enclosed postage-paid envelope. if you wish to receive this report. Thank you for your time and consideration.

Sincerely,

Sanjib Chowdhury, B. Pharmacy, MBA, ABD.

APPENDIX B

SECOND LETTER

[Name]
[Organization]
[Street Address]
[City, State, Zip]

Dear [Name]:

About five weeks ago, I wrote you seeking your valuable inputs regarding customer interactions in your organization. IF YOU HAVE RETURNED THE COMPLETED QUESTIONNAIRE FROM THE PREVIOUS MAILING, THANKS FOR YOUR SUPPORT AND PLEASE DISREGARD THIS LETTER. If you have not had a chance to complete the questionnaire yet, I request you to do so at your earliest. An additional copy of the questionnaire is enclosed with this letter, in case the original one was misplaced.

This study was undertaken to answer many important questions. For example: How does your effort to serve customer well can influence your performance? Are your customers creating task uncertainty to your organization? What kind of task uncertainty are they creating in your organization? How should you design your organization to encounter this uncertainty?

I am writing to you again because you hold valuable information to answer these questions and your participation is very important. ***Unfortunately, even if only a few individuals choose not to participate, that might turn the success into a failure of the research that has taken literally years to formulate***. Please do not underestimate the value of you participation!

In appreciation of your participation, ***I would offer an executive summary of the study findings***. Please send a copy of your business card along with completed questionnaire in the enclosed postage-paid envelope. if you wish to receive this report. Thank you for your time and consideration.

Sincerely,

Sanjib Chowdhury, B. Pharmacy, MBA, ABD.

APPENDIX C

QUESTIONNAIRE

PLEASE READ THIS BEFORE COMPLETING THE QUESTIONNAIRE
When answering each question, please keep in mind the definitions that are used here for customers and members of your organization. Customers are those people who interact with your organization, they could represent themselves, their friends and family, or third parties (other organizations) that are interested in buying your products/services. Organizational members are all people that work in your organization. Your answers should be based on your knowledge of the <u>overall</u> organizational activities. Therefore, when considering organizational members' encounters with customers, please consider the typical encounters for the overall organization.

Please pick a number from the scale to qualify the extent to which you agree or disagree with the statements. Circle the appropriate number based on the following scale.

Strongly Agree	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	Strongly Disagree
1	2	3	4	5	6	7

No	Statement	Strongly Agree						Strongly Disagree
1	The majority of encounters between our organization and customers are very brief	1	2	3	4	5	6	7
2	Many jobs in our organization use active participation of our customers (helping transaction process, actively participating in the designing, packaging, in the transportation process, by working out desired specifications and by filling out forms etc.)	1	2	3	4	5	6	7
3	The majority of encounters between members of our organization and customers take place inside our organizational facility	1	2	3	4	5	6	7
4	Members of our production and operations department (people who are responsible for creating service or producing products) directly communicate with a large proportion of our customers	1	2	3	4	5	6	7
5	Our customers spend extensive time within our organizational facility	1	2	3	4	5	6	7
6	Organizational members must use a very high degree of conceptual interpretation in order to comprehend customers' communication	1	2	3	4	5	6	7

No	Statement	Strongly Agree						Strongly Disagree
7	A very high proportion of what we offer to our customers is intangible (Not a physical product)	1	2	3	4	5	6	7
8	Customers' perception about our organizational facilities (condition of our building, equipment, furniture etc.) is very important for our success	1	2	3	4	5	6	7
9	Many customers notice the way services and/or products are made in our organization	1	2	3	4	5	6	7
10	Customers' perception about the individual attention displayed by members of organization is very important for our success	1	2	3	4	5	6	7
11	Customers' perception about the courtesy displayed by members of organization is very important for our success	1	2	3	4	5	6	7
12	Members of our organization interact with a fairly even mix of male and female customers	1	2	3	4	5	6	7
13	Members of our organization interact with customers from a highly diverse ethnic background	1	2	3	4	5	6	7
14	Members of our organization interact with customers from a highly diverse racial background	1	2	3	4	5	6	7
15	Members of our organization interact with customers from many different countries	1	2	3	4	5	6	7
16	Most members of our organization feel that it is possible for our customers to take the upper hand when interacting with the organization	1	2	3	4	5	6	7
17	Most members of our organization feel that our customers can not hurt the organization by being deceitful and/or opportunistic	1	2	3	4	5	6	7
18	Most organizational members deal with known or repeat customers	1	2	3	4	5	6	7
19	Our organization provides extensive individualized attention to our customers	1	2	3	4	5	6	7
20	Most members of our organization feel that it is possible for our customers to step on the organization for success	1	2	3	4	5	6	7
21	Members of our organization uses same equipment for processing products and services for most of our customers	1	2	3	4	5	6	7
22	We invest highly on individual customers	1	2	3	4	5	6	7

No	Statement	Strongly Agree						Strongly Disagree
23	Most members of our organization feel that it is possible for our customers to take advantage of the organization	1	2	3	4	5	6	7
24	Members of our organization use very different skills to provide products or services for different customers	1	2	3	4	5	6	7
25	Members of our organization use equipment differently for different customers	1	2	3	4	5	6	7
26	Specific knowledge about a typical customer is needed to effectively serve him or her	1	2	3	4	5	6	7
27	Products and/or services created for a specific customer are so customized that they can not be sold to another customer	1	2	3	4	5	6	7
28	The value of organizational resources (the physical, human, informational and financial) need to create products and/or services for an individual customer is very high	1	2	3	4	5	6	7

Please indicate the level (owner, chief executive, etc.) in your firm that has the authority to make the following decisions: Circle the appropriate number based on the 5 levels given below.

Owner or Board of Directors	Chief Executive	Divisional or functional top manager	Sub-department head	First level supervisors	Operatives at shop level
0	1	2	3	4	5

No.	Decision concerning	Circle the appropriate level					
1	The number of workers needed	0	1	2	3	4	5
2	Determining appropriate actions for customer disputes	0	1	2	3	4	5
3	Overtime to be worked at shop level	0	1	2	3	4	5
4	Delivery dates and priority of orders	0	1	2	3	4	5
5	Production plans and schedule	0	1	2	3	4	5
6	Method of work to be used	0	1	2	3	4	5
7	Machinery or equipment to be used	0	1	2	3	4	5
8	Resolving customer dispute	0	1	2	3	4	5
9	Spending unbudgeted money on customer service	0	1	2	3	4	5
10	Designing new product/feature/service	0	1	2	3	4	5
11	Allocation of work among available workers	0	1	2	3	4	5

Please pick a number from the scale to show the extent your organization uses written criteria for the following documents (1 represents minimal & 5 represents extensive use of written criteria).

No	Document	Minimal use =1				Extensive use = 5
1	Rules and procedures manual	1	2	3	4	5
2	Documents on fringe benefits	1	2	3	4	5
3	Written job descriptions	1	2	3	4	5
4	Documents on safety and hygiene	1	2	3	4	5
5	Written performance records	1	2	3	4	5
6	Documents on hiring/firing procedures	1	2	3	4	5
7	Documents on personnel evaluation	1	2	3	4	5
8	Written employment contract	1	2	3	4	5

Please respond by filling out the blanks with appropriate numbers. When responding to items, 3, 4, and 7, please circle days or months.

No	Item	Strongly Agree						Strongly Disagree
1	The majority of full-time employee of your organization have college education.	1	2	3	4	5	6	7
2	Most newly hired full-time employees undergo in-house training before taking up their (usual responsibility) jobs	1	2	3	4	5	6	7
3	The in-house training for newly hired full-time employees are very extensive	1	2	3	4	5	6	7
4	Full-time employees (other than newly hired) undergo regular in-house training	1	2	3	4	5	6	7
5	The in-house training for regular full-time employees (other than newly hired) are very extensive	1	2	3	4	5	6	7
6	Full-time employees undergo knowledge advancement education/training from external institues.	1	2	3	4	5	6	7
7	The external knowledge advancement education/training are very extensive	1	2	3	4	5	6	7
8	Most full-time employees (other than newly hired) receive professional training provided by your organization (in-house)	1	2	3	4	5	6	7
9	Most full- time employees (other than newly hired) receive professional training provided by external institutions	1	2	3	4	5	6	7

Your Industry_____   # of employees_____ Total company assets $ _____

APPENDIX D

RETAINED QUESTIONS

This table presents the questions that are retained after factor analysis and corresponding factors. Data on these questions were collected using a seven-point likert type scale where one represented strongly agree and seven represented strongly disagree. For hypothesis testing data on only these questions were used. The column headed by "No" shows numbers within parentheses representing the numbers of the particular questions in the original questionnaire.

No	Questions	Constructs
1 (1)	The majority of encounters between our organization and customers are very brief	Involvement
2 (2)	Many jobs in our organization use active participation of our customers (helping transaction process, actively participating in the designing, packaging, in the transportation process, by working out desired specifications and by filling out forms etc.)	
3 (9)	Many customers notice the way services and/or products are made in our organization	Intangibility
4 (10)	Customers' perception about the individual attention displayed by members of organization is very important for our success	
5 (11)	Customers' perception about the courtesy displayed by members of organization is very important for our success	
6 (12)	Members of our organization interact with a fairly even mix of male and female customers	Diversity
7 (13)	Members of our organization interact with customers from a highly diverse ethnic background	
8 (14)	Members of our organization interact with customers from a highly diverse racial background	
9 (16)	Most members of our organization feel that it is possible for our customers to take the upper hand when interacting with the organization	Customer Acquisitiveness
10 (20)	Most members of our organization feel that it is possible for our customers to step on the organization for success	
11 (23)	Most members of our organization feel that it is possible for our customers to take advantage of the organization	
12 (19)	Our organization provides extensive individualized attention to our customers	Customer Importance
13 (22)	We invest highly on individual customers	
14 (26)	Specific knowledge about a typical customer is needed to effectively serve him or her	
15 (28)	The value of organizational resources (the physical, human, informational and financial) need to create products and/or services for an individual customer is very high	

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