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**SALESFORCE INVOLVEMENT
IN NEW PRODUCT PREDEVELOPMENT ACTIVITIES
OF HIGH TECHNOLOGY FIRMS**

by

CANDACE PETERSEN

**A dissertation submitted in partial fulfillment
of requirements for the degree of**

**DOCTOR OF PHILOSOPHY
in
SYSTEMS SCIENCE: BUSINESS ADMINISTRATION**

**Portland State University
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DISSERTATION APPROVAL

The abstract and dissertation of Candace Petersen for the Doctor of Philosophy in Systems Science: Business Administration were presented June 12, 1996, and accepted by the dissertation committee and the doctoral program.

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ABSTRACT

An abstract of the dissertation of Candace Petersen for the Doctor of Philosophy in Systems Science: Business Administration presented June 12, 1996.

Title: Salesforce Involvement in New Product Predevelopment Activities of High Technology Firms.

The strongest correlate of new product success is understanding of market requirements early in the new product development (NPD) process. This is true in high technology environments where rapid change and chaotic market conditions prevail. Although a firm's salesforce is viewed as one of many sources of new product ideas and market information, the involvement of salespeople in NPD activities varies widely across firms.

This study examines salesforce involvement in a firm's NPD predevelopment activities, i.e. idea generation and screening, preliminary market assessment, and concept evaluation. Because of

the limits of existing research in this area, a two-phase research design was used. The first phase developed a scale for measuring salesforce involvement in NPD predevelopment activities. This scale was incorporated into a study model. The second phase tested the study model, a linkage of salesperson involvement level to organization and individual salesperson attributes.

The scale-development sample consisted of 136 sales professionals. The resulting scale was a nineteen item, multi-dimensional measure incorporating three factors of involvement: involvement initiated by the salesperson, involvement initiated by NPD-Organization, and a salesperson's cognitive interest in NPD involvement.

In the second phase of the study, a sample of 248 salespeople from nineteen companies completed self-administered written surveys. At the organization attribute level, the length of the NPD cycle was significantly associated with involvement subscale measures. In particular, the longer a firm's NPD cycle for product improvements, the less involvement the salesforce has in NPD-headquarters initiated involvement activities. A similar significant relationship exists between a firm's new product cycle time and the level of involvement in salesforce-initiated NPD predevelopment activities.

At the study model's salesperson level, a series of factors were associated to NPD team-initiated and salesforce-initiated involvement subscales. These factors are a salesperson's: customer orientation, location distance from NPD, level of feedback from NPD, membership on NPD teams, knowledge of where to send NPD-related information, and belief that information communicated to NPD will be appropriately used. Study findings suggest that organizations can affect the degree of involvement that their salesforce or individual salespeople has in early phases of NPD.

ACKNOWLEDGMENTS

Numerous professionals, academicians, family, and friends made significant contributions to this study. The sources of my research data were the many salespeople, corporate managers, and professors that generously gave interviews and evaluated questionnaires. Over 300 sales professionals at twenty companies completed surveys and must be thanked anonymously. A special thanks to my employer, In Focus Systems. In particular: John Harker, Mark Reed and Reed Stager for their support, encouragement and patience as I proposed and completed this study while in their employment.

I thank the members of my dissertation committee for their suggestions, expertise, and time as they supported me through the dissertation process. I was especially privileged to have Dr. Lewis N. Goslin as my committee chairman and program advisor. His patience and ability to keep me on track were the key ingredients to my success in the doctorate program.

Above all, I thank my husband Dick, and sons Pat, Ben and Mark. I am truly blessed by their love and unselfish support of my dream of achieving a doctorate degree. Without the help and understanding of my family, this thesis would not have been possible.

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CHAPTER I

INTRODUCTION

This study focuses on the degree of salesforce involvement in the initial activities of new product development (NPD) in high technology and industrial industries. As such, the study defines the concept of *involvement* from the salesperson perspective, develops a scale for measurement, and tests a model of relationship between *involvement* and select organizational and interpersonal variables.

A systems perspective (Lendaris 1986) is applied in this investigation and views a firm's salesforce as one system and the NPD team and processes as another system. The relationship between the two systems during the early stages of NPD defines the research context. The systems perspective also facilitates and organizes the dual-level study of the salesforce and salesperson as they interact with the firm's NPD efforts.

Chapter I discusses the purpose of the study and its context, the dynamics of NPD in American businesses. A general model of NPD process is presented that defines the concept of predevelopment

activities. The salesforce role in NPD is introduced as a boundary-spanning function between market and firm, with the potential to introduce market-oriented information into NPD predevelopment activities. The information linkage between a firm's salesforce and early NPD activities is defined here as the *involvement* factor, the focus of this research. The chapter concludes with presentation of the research questions.

Research models and relevant literature are provided in Chapter II. To establish the research context, the concept of salesforce involvement in predevelopment activities is defined as using a multi-dimensional model. Results of a pilot study and related academic literature are presented as rationale for construction of an involvement measure. Theories related to organizational and personal influences on salesforce involvement are presented in support of a proposed model of predictors of salesforce involvement. A recap of the study's hypotheses completes this chapter.

Chapter III presents the research methodology and the results of scale development, which is the first of two study phases. The scale development process which includes item generation, rating by expert judges, and salesforce item evaluation is outlined for the measure of two variables: salesforce involvement, and the degree of belief that a

salesperson has that his* information will be used appropriately in the NPD process. The two resulting scales are presented and discussed at the chapter's conclusion.

The methodology for testing the hypotheses generated by the Phase Two predictor model is presented in Chapter IV. Sample selection, research plan and data collection procedures are discussed. Next, measures are described for each independent and control variable. In conclusion, the data analysis plan for hypothesis testing is reviewed.

Chapter V contains the results of the data analyses. First, sample descriptive statistics are provided. Next, results of the statistical analyses described in the previous chapter for the test of hypotheses are presented. A recap of hypotheses-testing results concludes this chapter.

The last chapter elaborates on the meaning of study results. In addition to reviewing the salesforce involvement measure, the results derived from testing the model are discussed as related to organizational and personal attributes. Possible implications of study results will be offered for business management interested in the salesforce-new product development linkage. Finally, potential

* His is used for his/her personnel

weaknesses of this study and suggestions for future research are presented.

Purpose of the Study

The intent of this research is to understand the *involvement* of the salesforce as a valuable and rich resource in the initial steps of new product development. Prior research in this area has been limited. Accordingly, this study first defines and explores the structure of salesforce involvement within the context of early stages of a NPD process. A metric for the notion of *involvement* and a model to explain the metric's variance were necessary starting points. This research establishes a foundation for a clear understanding of the early stages of NPD and the concept of involvement, within the context of this study's problem area.

The ability to develop new product ideas and offer new products that reflect the ever-changing requirements of its customer base is a key determinate of a firm's long-term success. New product development (NPD) is a high-risk endeavor. The risk occurs at several levels. First, there is a significant attrition of new product ideas. For various reasons, less than one out of ten ideas (10%) initially considered for development make it to the market. Second, an

estimated 35 - 50% of all new products and product line extensions introduced to the marketplace never reach commercial success (Booz, Allen and Hamilton 1982, Angur 1991).

In addition to the risks, NPD is a high-cost undertaking. Reported new product investment for industrial firms average \$800,000 in capital and 900 man-days of effort (Cooper and Kleinschmidt 1988). In terms of sales, a typical industrial firm can expect to spend 5% of its revenues on R&D, and closer to 10% on overall new product development expenses (Cooper 1993). Such a profile of risk and expense has prompted numerous researchers, consultants and business people to investigate further into the composition of NPD.

The Composition of NPD

There are three basic ideas central to the definition NPD: process, spectrum, and synthesis. The first view is that NPD is a *process*: an evolution of an idea into a tangible market offering (Moore 1987). Second, NPD addresses a full *spectrum* of outcomes of NPD ranging from modifications in existing designs to the development of discontinuous innovations (Clark, Chew, and Fujimoto 1987). Finally,

the NPD process is a *synthesis* of a firm's technical capabilities and market understanding.

It is the ability to synthesize a firm's resources, technical knowledge, and market understanding that renders NPD a system. As a system, NPD manifests a solution to customer needs that can not be duplicated by mere summation of the components. How the components relate to each other is of equal importance when studying NPD from a systems perspective. The variance in NPD results stems from the dynamics of the NPD process as it balances technology, resources and customer requirements.

A strong differentiator between new product success and failure is a firm's ability to couple initial NPD activities with a solid understanding of the target market. Studies have noted that firms which have a greater emphasis on market orientation in early stages of product development reflect a higher rate of new product successes (Crawford 1979, Maidique and Hayes 1984, Cooper 1988). Strong market orientation is critical in high technology firms where rapid change and chaotic market conditions prevail (Moore 1987, Beltramini 1988, Workman 1993).

There are numerous approaches in the domain of market research that facilitate the monitoring of critical customer

requirements for a proactive market-orientation. These approaches range a spectrum from structured or quantitative data collection in customer surveys and complaint reports to qualitative inputs from customer visits, trade shows and user groups. In addition to these direct customer inputs, other organizational functions are tapped as indirect sources of market information. By the nature of their job, an organization's salesforce has the function of continuous interaction with the marketplace. As such, salespeople have the potential to be a source of customer information critical to early definition of market requirements for proposed new products.

The role of the salesforce in initial stages of product development varies greatly across both industrial and high tech firms (Pavia 1991). Salesforce involvement in early NPD process activities such as idea generation and assessment ranges from non-existent to full participation on NPD committees and market study projects (Evans and Schlacter 1985). Although it is widely assumed that salesforce involvement in NPD activities is beneficial to companies, research that measures salesforce involvement or links it to other factors is lacking in research literature. Researchers have called for increased study and understanding of the role of the salesforce as an information source in

early phases of NPD (Grace and Pointon 1980, Rochford and Wotruba 1993).

Early Stages of New Product Development (NPD)

Both descriptive and prescriptive models have been developed over the past three decades for outlining the NPD process from idea to product launch. Early prescriptive models usually specified a series of twenty or more steps that a company should take when undertaking a new product project (De Brentani 1983). Many were derived from a project management orientation which focused on ensuring technical feasibility of the product rather than its market acceptance.

In contrast, recent descriptive models (circa 1980s and 1990s) are derived from extensive surveys and interviews of companies' actual experiences in new product development. This research found common patterns in the activities and procedures firms follow from inception to commercial availability for either new product or major enhancement.

Common to all descriptive models are three major process stages:

1. idea generation and screening,
2. product development,
3. testing and commercialization.

Though few firms complete all steps identified within these stages, survey results have identified activities associated with these steps that are critically connected to product success.

From the early descriptive models Booz, Allen and Hamilton's (BAH) Six-step Model (Booz, Allen and Hamilton 1968), clearly is a precursor to contemporary conclusions. In this BAH study of 51 firms, new product development was identified as passing through the six stages of Idea Generation, Screening, Business Analysis, Product Development, Product Testing, and Commercialization. In addition, the BAH study revealed a pattern in comparing at each stage the number of ideas or projects being pursued (e.g. the rates of project attrition) and the cumulated NPD project expenditures (figure 1).

..

Figure 1. Stages in the new product process: rates of project attrition and project expenditures (Booz, Allen and Hamilton 1968).

The graph clearly indicates that at the conclusion of Idea Generation, Screening and Business Analysis stages, the number of new product ideas are drastically reduced with a minimum of expense. Subsequent research indicates these so-called predevelopment steps, i.e. Idea Generation, Screening, and Business Analysis, are a critical component of NPD success (Cooper and Kleinschmidt 1986, Cooper 1988). Furthermore within these predevelopment steps, the

understanding of market - as opposed to technology - is the strongest linkage to new product success (Maidique and Zirger 1984, Cooper 1988).

More recent models have varied only slightly from the BAH findings. One example, the process description offered by Cooper (1988), is the context model for this research (figure 2). Cooper's research led to development of a NPD model with greater emphasis on those steps that assess and further define an idea before formal development. In particular, Cooper collapsed idea generation and screening into a single step while separating predevelopment analysis into more definitive activities of assessment and concept/feature analysis.

Figure 2. NPD process model (Cooper, 1988).

Cooper further emphasized the importance and understanding of market-oriented predevelopment activities by developing a sub-model that illustrates the sequencing of these key NPD tasks (figure 3). The sub-model outlines the flows of information between the technical activities and market activities. The rectangles in the center layer of the diagram represent key evaluation or decisions points in the process such as initial idea screening or concept evaluation.

Figure 3. New product process predevelopment steps (Cooper 1988).

A detailed description of each of the so-named market activities is provided in Table I (Cooper and Kleinschmidt 1988). By associating predevelopment steps with specific activities, Cooper was able to study

relationships between a firm's NPD success and execution of activities. Omission or poor execution of a particular activity could be analyzed for linkage with the outcome of a specific NPD effort.

TABLE I
A DESCRIPTION OF IDENTIFIED PREDEVELOPMENT ACTIVITIES
(COOPER 1988)

1. Idea Generation	Mentally conceiving suggestions for new products.
2. Initial Screening	The initial decision point of whether any resources should be devoted to developing the idea.
3. Preliminary Market Assessment	A first, quick look at the target market, usually a non-scientific approach to determining market requirements.
4. Preliminary Technical Assessment	A first, quick look at the feasibility and merits of the product from a technical perspective.
5. Preliminary Evaluation	A second evaluation, this time including quick financial analysis.
6. Concept Identification	Provides a definition of the product's exact features and value to the proposed market.
7. Concept Generation	Translation of the concept into a technical "breadboard" or paper prototype, with significant emphasis on technical solutions to the identified market needs.
8. Concept Test/Study	A test or study of the market place to see if the product is heading in the right direction before development. It should be a confirmation that the values and requirements are correctly reflected in the product design.
9. Concept Evaluation	Final decision point before moving into full scale product development.

In his research, Cooper concluded that the primary cause of product failure is due to inadequate market definition and analysis in the predevelopment phase of NPD (Cooper 1988). Cooper's research

project NEWPROD II, surveyed over one hundred industrial firms and¹⁴ found that a mere 2% of all NPD dollar expenditures and 5% of NPD man-day efforts were focused on market-oriented predevelopment activities (Cooper and Kleinschmidt 1988). Yet these same firms indicated they were weakest in understanding and performing the specific NPD activities (noted by shading in Table II) of idea screening-generation, preliminary market assessment and predevelopment market study.

Cooper and Kleinshmidt created the indices of relative proficiency for each of the fourteen NPD activities listed in Table II by first working with each of the participant firms to identify a number of new products. Next, these products were classified as successes or failures depending on a number of criteria such as return on investment, ability to achieve proposed marketshare and revenue forecasts, and adherence to the original NPD budget and timeline. Finally, company executives were asked to rate their efforts for a particular product on each of the fourteen activities using a scale of 1 to 10 (10 representing most proficient or skilled, and 1 indicating little proficiency or effort to perform the activity).

A firm's perceived proficiency in many of the fourteen activities were significantly related to the success or failure of a new product

(Table II). In particular, perceived proficiency scores for each of the seven predevelopment activities significantly differed depending on whether the product was a success or failure. These results confirmed earlier work done in 1972 and 1976 Conference Board studies and by other research groups that the greatest area of need in NPD is more in-depth and timely market information in the predevelopment phase of the process.

TABLE II

PERCEIVED PROFICIENCIES* OF NPD ACTIVITIES

Activity	Level of Statistical Significance	Proficiency of NPD Failures	Proficiency of NPD Successes
<i>Predevelopment</i>			
Initial Screening	.001	3.67	6.25
Preliminary Market Assessment	.002	4.43	5.92
Preliminary Technical Assessment	.001	5.22	7.45
Market Study	.013	4.38	6.59
Financial Analysis	.013	5.59	6.87
Concept Generation	.046	6.12	7.35
Product Development	.001	5.45	7.13
<i>Postdevelopment</i>			
In House Testing	.003	6.23	7.31
Customer Product Tests	N.S.	6.41	6.83
Test Market Trials	.040	6.00	7.35
Trial Production	N.S.	6.70	6.83
Pre-Commercialization Business Analysis	N.S.	5.56	6.56
Production Start-up	N.S.	6.24	6.44
Market Launch	.050	5.58	6.71

* Proficiencies of activities: successful products versus failures. Proficiency of activity is measured on a scale of 0 to 10 rating as perceived by the company (Cooper and Kleinschmidt 1986). Shading reflect firms' self assessment of weak skill in an activity.

A two-step process created an operational definition of predevelopment activities for the context of this study. The first step adopted the nine activities labeled as *predevelopment* in Cooper's

research (refer back to Table 1, page 13) as the overall operational definition of predevelopment activities. This set was further reduced to reflect the study's focus on the role of the salesforce in NPD. As such, only those predevelopment activities requiring a market or customer orientation were considered. Consequently, the construct "salesforce involvement in early stages of NPD", is bounded within Cooper's seven activities that precede product development and involve market focus:

Idea Generation:

Mentally conceiving suggestions for new products.

Initial Screening:

The initial decision point of whether any resources should be devoted to developing the idea

Preliminary Market Assessment:

A first, quick look at the target market, usually a non-scientific approach to determining their needs.

Preliminary Evaluation:

A second evaluation, this time including quick financial analysis.

Concept Identification:

Provides a definition of the product's exact features and value to the proposed market.

Concept Test/Study:

A test or study of the market place to see if the product is heading in the right direction before development. It should be confirmation that the market's values and requirements are correctly reflected in the product design

Concept Evaluation:

Final decision point before moving into full scale product development.

In summary, this is a study of salesforce involvement in NPD limited to those activities that support idea generation, market-oriented project evaluation, and product definition before product development begins.

Role of the Salesforce in Early NPD

The salesforce as a valuable piece of the early market requirements puzzle has been identified in numerous studies and research literature (von Hippel 1978, Shanklin and Ryans 1984, Angur 1991). Thirty years ago, Frederick Webster cited the potential importance of salesforce involvement in early product development, particularly in the areas of idea generation and early assessment (Webster 1965). Furthermore, he pointed out singular advantages of using the salesforce to obtain market intelligence. These advantages included: low incremental costs, continuous customer interactions and a greater likelihood for customers to be open with a salesperson over some unknown market researcher or other company representative.

From a systems perspective, the salesforce has a unique boundary spanning role between the organization and its marketplace (figure 4). Using the systems approach of Lendaris (1986), the salesforce as a system is viewed from two perspectives. The first

approach views the salesforce, firm and marketplace as components of a supra-system: the matching of customer needs with a firm's goods and services. In this view, the salesforce demonstrates a unique quality as the vehicle for transferring information and other assets between the two entities. This study is particularly interested in the relationship between salesforce and firm that impacts the flow of NPD-related information from salesforce to firm.

Figure 4. Boundary-spanning role of the salesforce.

The second, or subsystem view, perceives the salesforce as a system made of individual people and their unique character traits. The relationship between salesperson and customer, and salesperson and corporate processes such as NPD is a dynamic exchange of

information, product and capital. This study is interested in understanding what impacts the degree of NPD-related information flow from salesperson to firm as a manifestation of a person's attributes and firm's characteristics.

In contrast to the dynamic nature of the salesforce as a information generating system, most other forms of market intelligence can be viewed as static, or single time-stamps of market requirements. Data collection tools such as surveys, customer visits by R&D, focus groups, customer advisory councils, and interviews may have the advantage of being tailored for specific intelligence gathering, but the shelf-life of these studies can be rather brief. Furthermore, in terms of closed-loop feedback, little connection is made between a particular market research tool and the results of the research, i.e. a product launch months or even years later. In comparison, the salesforce can experience a loss in future sales if they are not effective in relaying new customer requirements to the firm.

Despite the attractive positioning of the salesforce, the bias of management is to focus the salesforce on *present* transactions between firm and customer. In this role, the salesforce is widely used for current product sales forecasts, customer satisfaction, and competitive price monitoring (Chonko, Tanner, and Smith 1991). There are

arguments on the merits and pitfalls of using the salesforce as a conduit of information related to future product needs and capabilities when its first priority is meeting today's customer needs with today's products. Research is limited in this debate, although several studies confirm a low usage of salesforce information in defining new product requirements (Grace and Pointon 1980, Chonko, Tanner, and Smith 1991).

One aspect of this debate centers on the ability of the salesforce or customers to define future requirements, especially in high technology industries. Yet, extensive research by von Hippel has indicated that the majority of new product ideas in industrial firms are customer generated (von Hippel 1978, 1988, Angur 1991). Such findings have led von Hippel to question why the salesforce is not more often used as a "new-need/new-product idea reception area" (von Hippel 1978).

In short, the boundary spanning role of the salesforce is an underlying premise of this study, as is the call for more market-orientation in the early stages of NPD. It is also noted that many industrial and high technology new products stem from customer ideas and dialogue on future needs. Since little investigation has directly addressed this fit between salesforce and critical predevelopment

activities of NPD, this study introduces the notion of *involvement* as the surrogate for linkage.

Involvement Defined

The concept of *involvement* is multi-faceted in usage and warrants specific definition in the context of this proposed research. Involvement can range from physical participation in an activity (Webster 1992) to the cognitive state of perceiving importance in an object or event (Peter and Olsen 1994). Involvement also varies widely in intensity and duration between individuals as a function of personality, values, and experiences. In short, it signifies a commitment of attention and energy to some entity.

This study uses the term *involvement* to integrate three key premises:

- (1) Greater knowledge of customers and markets is needed by high technology firms in new product predevelopment activities.
- (2) The salesforce is a source of market understanding.
- (3) There exists an information-transfer relationship between the salesforce system and the system of NPD.

To link these premises in this study, *involvement* signifies a physical participation in activities that are centered on opportunities for communication and actual communication. Salesforce involvement in

predevelopment activities, therefore, is the mechanism that facilitates transfer of salesforce perspective of market understanding into the NPD process. Without such involvement, a salesperson's customer insight can not be transferred into a predevelopment activity.

The cognitive aspect of involvement is also important to this study. Although physical presence in a brainstorm session or initiating a phone call to R&D are indicators of involvement, such activities are preceded by the perception of their value. The salesperson first recognizes a need or value to transferring knowledge into the firm before initiating the act.

Consumer behavior research supports this aspect of involvement, and similarly defines it as cognitive awareness preceding some behavior. Involvement by either consumer or salesperson is marked first by a level of interest in the product or event (Bloch 1979). A parallel cognitive activity evaluates the benefits of possible actions and behaviors with respect to the product or event. In short, because rational man first thinks then acts, involvement is a two-part construct.

This study proposes that the degree of involvement can be assessed by both physical participation and the interest level in information transfer activities. In terms of physical involvement, this

study proposes that there exists for the salesforce, a domain of actions or activities that facilitates the transfer of a salesperson's customer/market perceptions to the predevelopment stage of NPD. Through involvement, or participation in a activity, the opportunity for transfer exists. Obviously, the spectrum of activities ranges from the informal phone call or conversation to formal membership on a NPD team. Without involvement in these activities, the information and perspective of the salesforce can not be transferred into the NPD process.

The cognitive aspect of salesforce involvement will also be addressed in the construct domain. In particular, the interest in information transfer in predevelopment activities will be assessed with select items of the survey instrument. Together with physical participation, involvement can be operationally defined and analyzed in this proposal.

This definition of involvement also limits our perspective to that of the salesforce. Since they fill the sending role in the transfer of perceptions or knowledge into the NPD process, it is from their viewpoint that involvement is measured. The variance in the degree of salesforce involvement is the focal point of this study and reflected in the research questions.

Research Questions

Salesforce involvement in NPD predevelopment activities is a concept with a limited research foundation. There exists substantial academic literature that discusses the value of salesforce input into the NPD process. Yet this research is without reference to definition or measurement of this base concept. Consequently, any research of value must first explore and define the structure of salesforce involvement and then test hypotheses regarding the prediction or explanation of the variable. Such a study is initially exploratory in nature, requiring greater discipline in selecting operational definitions.

The systems approach outlined by Lendaris (1986) is valuable in reducing these problem issues into research questions. The systems approach focuses on the use of multiple perspectives to organize and separate observed data and relationships into manageable subsets of the problem. The enforcement of a minimum of two views of the problem system ensures that the researcher is mindful of both “forest” and “trees” in analysis and problem-solving.

This technique advises the researcher to view a problem area as a system that must meet two criteria:

- A) Operate as a unit with certain attributes perceived relative to its environment.

- B) Operate as a unit that contains subunits that work together to create these perceived attributes (Lendaris 1986).

The first, or A level view of a problem area involves observing it as a whole, defined with characteristics that can be viewed in the context of its environment. The second view or B level sees the parts of the problem area as they effect those prior observed characteristics.

Using a systems approach as a template, this problem area of salesforce involvement in predevelopment activities translates into a organizational system that is observed from three perspectives. The first view concerns this system in the context of business research. The next perspective examines the relationship between organizational attributes and salesforce involvement, while the third views the role of individual attributes in salesperson involvement. Each perspective in turn, poses a broad-based research question, used to develop the study model and hypotheses.

The first perspective produces the research question that deals with the measure of salesforce or salesperson involvement in NPD predevelopment activities:

Research Question #1

How can salesforce involvement be measured for research purposes?

A scale needs to be developed that will produce a relevant measure of the salesforce system attribute of *involvement*. Its definition and

measurement allows the researcher to observe changes in salesforce involvement under various conditions and offer additional insight into how the salesforce system functions.

A view of the system at the organizational level produces a research question of what variables relate to the variance in degree of salesforce involvement in predevelopment activities. Since the problem area focuses on behavior and attitude in a firm, organizational theory suggests one group of variables will stem from organizational attributes, and the other from individual characteristics (Daft 1992). These two classifications of influences divide the B-level perspective into two separate research areas.

The systems view of salesforce involvement as a product of various organizational attributes generates the research questions:

Research Question #2

How do organizational attributes relate to the degree of salesforce involvement in NPD?

Each organization contributes a different composite of systems, culture, and processes that should explain some of the variance in salesforce involvement across firms. Therefore, this study identifies those attributes most likely to correlate significantly with the level of salesforce involvement in an organization.

The last research question views how individual or personal characteristics of a salesperson relate to his involvement in predevelopment activities, that is:

Research Question #3

How do the personal characteristics of salesperson relate to degree of involvement in NPD predevelopment activities?

Such a question will prompt investigation into differences between salespeople as it relates to their involvement in early NPD. While organizational traits such as systems or culture can relate to differences of salesforce involvement across companies, individual attributes explain variance within a firm. Together, the second and third research questions deal with understanding the “how” of salesforce involvement, while the first research question represents the “what”.

CHAPTER II

STUDY MODELS AND SUPPORTING LITERATURE

This literature review supports and explains choices of the study model and its hypotheses. Selected studies and articles have previously been cited (Chapter 1) in support of problem area definition and research question development. In particular, the earlier work of Cooper (1985, 1986, 1988) frames the research within the context of NPD predevelopment activities.

This chapter initially introduces a model which depicts underlying constructs of salesforce involvement in predevelopment activities. Next, a second model is presented which associates organizational and individual attribute variables to salesforce involvement. Arguments are presented for each variable's inclusion at the organizational or individual attribute group and for that variable's associated measure. Research hypotheses are summarized at the conclusion of the chapter.

Phase One Model of Salesforce Involvement

This study of salesforce involvement in predevelopment activities of NPD is lacking in quantitative research precedents. Workman (1993) noted that while it is assumed in marketing literature that sales groups should have significant role in NPD decisions, negligible empirical research particularly in the realm of high-tech firms has evolved. Consequently, the first step in researching this construct is clearly to understand its dimensionality and develop a measure for its use in subsequent research. Development of a model to represent the structure of salesforce involvement serves two purposes: it will aid in generating items for scale development and provide possible explanations for the results of a factor analysis of the instrument.

Although literature specific to salesforce involvement in early NPD is limited, larger research domains encompassing this topic have been studied and documented. Such research provides a starting point in defining this concept. For example, the parameters of predevelopment activities have been extensively studied by Cooper (1983, 1984, 1985, 1986, 1988, 1993), Cooper and Kleinschmidt (1986, 1988, 1991, 1993), and Booz, Allen and Hamilton (1968, 1982). These works define the activities and objectives of the predevelopment phase of NPD as previously outlined in Table 1 on page 13.

Other researchers have investigated the role of the salesforce in NPD. The majority view a definite value of salesforce involvement (Webster 1965, von Hippel 1978, Day 1991, Workman 1993), although specifics on the means and processes are vague at best. The literature tends to be prescriptive as it recommends involving the salesforce as another customer oriented information source to the firm.

Indeed, market orientation and intra-organizational information transfer make the greatest contribution to understanding the human dynamics of salesforce involvement in NPD. In particular, the scales developed by Kohli and Jaworski (1993) are directly applicable to predicting involvement as influenced by interdepartmental relationships. The research of Macdonald and Williams (1993) of information gatekeepers suggests variables such as an individual's perception of information usage by the NPD function will also relate to involvement.

In order to provide specific insight into the integration of this earlier literature, a qualitative pilot study was conducted. The pilot study utilized a focused interview approach to generate items that would be possible components of involvement. The study consisted of thirty-minute interviews with fifteen employees of a Portland, Oregon

high-tech firm. Interviews were evenly distributed between engineering, sales, and executive management personnel.

Respondents from the sales department were asked to discuss how they presently are, or could be, involved in the NPD process before full development of a new product concept. Similar interviews were also conducted with members of the other departments, with added questions as to the value of the salesforce in NPD. Their responses were used to cross validate the salespeople's self perception of their role in early NPD involvement, in addition to providing other insight on processes and systems used in the predevelopment phase of NPD.

The pilot study process and analysis were conducted according to Glaser & Strauss' (1967) guidelines for qualitative research. In particular, the taped interviews were reviewed for common themes or categories in the responses. Matrices of frequency counts for respondent discussion of these themes or topics provided a loose measure of relative importance.

This process revealed several common dimensions of how respondents viewed or categorized salesforce involvement in predevelopment activities. The more strongly suggested dimensions were correlated with related literature, and then used to construct a proposed Phase One model of the composition of salesforce involvement

(figure 5). This model is fundamental to the generation of items required in scale development of salesforce involvement.

Figure 5. Phase One model of the key dimensions of salesforce involvement in NPD predevelopment activities.

As discussed in Chapter I, this study defines *involvement* as both the physical participation in predevelopment activities and the perception of interest in information transfer to NPD activities. Involvement means that a salesperson will attend a brainstorm session and be motivated to participate. These two aspects of involvement are interwoven in its domain. Consequently, items generated for the domain pool of this construct represent both physical and cognitive views of involvement in activities.

The pilot study interviews (Appendix C) suggested a number of dimensions to the definition of salesforce involvement in NPD activities. One dominant theme was the classification of predevelopment activities possible through either local ("face to face") or remote ("electronic") involvement. Salespeople are especially sensitive to operating as a virtual employee, utilizing tools such as electronic mail, voice mail, and interoffice memos to maintain as significant a presence as possible in NPD decisions. Moncrieff, Lamb, and Mackay (1991) identified laptop computer technology as being the catalyst for involving salespeople in more staff activities as a virtual participant. The pilot study interviews generated involvement activities that included localized communications in the form of meetings, one-on-one office visits, and joint customer calls for product managers and salespeople.

Another underlying dimension revealed in the interviews was that of solicited - unsolicited communication from the salesforce regarding a new idea, feature definition, or market assessment. Studies indicate the salesforce is active in both solicited and unsolicited information transfer, using unsolicited for more urgent or critical messages (Festervand, Grove, and Reidenbach 1987). One study did point out that while unsolicited information from the salesforce was more timely, its content was less insightful than that

produced through structured surveys or direct questions (Grove, LaForge, Knowles and Stone 1992).

The pilot study also confirmed that involvement may relate to different forms of salesforce motivation. Several respondents indicated that feedback was particularly important in unsolicited involvement. Salespeople do not continue to volunteer information if they have no idea of what happens to it. In the case of solicited involvement, emphasis shifts to perceiving the NPD functions as intelligent users of the information. Festervand, Grove and Reidenbach (1993) suggested that the less formal the salesforce information transfer process, the greater the influence of feedback as a motivator.

The third dimension to salesforce involvement originates with Cooper's model of the NPD process. Many of the actions associated in the interviews with early salesforce involvement in NPD, corresponded to the activity categories identified by Cooper in Table I, page 13. Pilot study respondents frequently implied a dependency between specific communication actions and whether their input referred to suggesting a new idea or assessing an existing product concept. Cooper and Kleinschmidt (1988) also point out a number of predevelopment activities such as brainstorming sessions that are unique to a particular step in the NPD process.

The dimensions or aspects of salesforce involvement are certainly not limited to the three identified in this study. However, these do represent the ones most often suggested in pilot study interviews, and supported through literature. The model of these dimensions provides a starting place for identifying all possible modes of salesforce involvement, a beginning for generating items for measuring this construct. For example, a salesperson involved in a brainstorming session for new product ideas would fall in the cell of local, solicited, and the first step of the NPD, as illustrated in figure 5 on page 34.

The Phase One research model also endorses the use of exploratory factor analysis in this study for developing the new variable of salesforce involvement. Multi-dimensionality of this construct was suggested by the pilot data, but the sample size of fifteen interviews was not large enough to support a hypothesis of strength or number of dimensions. The application of exploratory factor analysis on the generated item pool, and an adequate data sample, will statistically establish the underlying composition of the salesforce involvement variable (Rummel 1970). Such validation is needed if this measure is to be used as a unidimensional variable in testing the relationships between salesforce involvement and other variables.

Phase Two Model of Involvement Predictors

Scale development and testing address the study's first research question, i.e., how can salesforce involvement be measured for research purposes. The next two research questions deal with predictors of salesforce involvement - the first addresses organizational level factors, and the other the personal or individual variables. This segmentation is fundamental to the development of a research model that associates variance of salesforce involvement to characteristics of individual salespeople and organizational attributes (figure 6).

Predictors of Salesforce Involvement in NPD Predevelopment

Figure 6. Phase Two model of salesforce involvement and its predictors.

This model expands on the Phase One model of salesforce involvement presented in figure 5. The salesforce involvement is

depicted in the model as a function of organization traits and salesperson attributes. The dotted line denotes the two perspective or systems view of the relationship between the salesforce and NPD, and the salesperson and NPD. Organization traits and personal attributes are further defined in the model as groupings of variables. Organization traits are denoted as:

- Interdepartmental Dynamics,
- Formalization of NPD Process, and
- NPD Cycle Time

and personal attributes are defined as:

- NPD Knowledge,
- Perception of Value to NPD,
- Communication Enablers, and
- Customer Orientation.

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Organizational Variables

Organizational variables are those traits that do not vary within a firm, and can explain a proportion of the variance in salesforce involvement between firms. Although it is recognized that there are interactions between organization and personal variables, the scope and the intent of this study is interested in the direct relationship between specific organization traits and salesforce involvement. Each

of the three hexagons in the upper part of figure 6 represents a different conceptual argument for its inclusion in the model.

Interdepartmental Dynamics

The first organization trait hypothesized to affect salesforce involvement is that of the relationship between departments, particularly those involving sales and groups involved in NPD such as marketing, engineering, product management, or R&D. The theory behind the inclusion of this concept comes from research work on market orientation. Kohli and Jaworski (1990, 1993) developed a scale to measure market orientation as a reference to organization-wide generation of market intelligence, dissemination of the intelligence across departments, and organization wide responsiveness to it (Kohli and Jaworski 1993: 53).

This scale also included components for specifically measuring the unidimensional concepts of interdepartmental conflict and interdepartmental connectedness. Interdepartmental conflict refers to tension among departments that inhibits communication from one to the other, thereby lowering dissemination of market intelligence. As applied to salesforce involvement, interdepartmental conflict would likewise prohibit dissemination or transfer of market information by

lowering the willingness of the salesforce to contribute information to other departments. In other words, the greater the interdepartmental conflict, the less the salesforce involvement.

Interdepartmental connectedness, on the other hand, refers to the degree of contact employees have across departments (Kohli and Jaworski 1993: 55). Research does indicate that the higher the degree of connectedness, the greater the exchange of information. This also implies a greater level of salesforce involvement in information dissemination activities in the new product predevelopment phase. Based on this literature, the first hypothesis relating organization-level concepts hypothesis and its associated variable measures is:

H1: The stronger the relationships between departments, the greater the level of salesforce involvement. Interdepartmental relationships are measured by the variables:

a: Interdepartmental conflict.

b: Interdepartmental connectedness.

Formalization of NPD Process

Cooper (1988, 1993) has shown that formalization of the NPD process by establishing procedures and committees in the early steps of NPD will improve and increase market understanding in these activities. Because of the remote location of most field salespeople, it is easier to involve the salesforce in an established or planned NPD

activity than include them in a spur-of-the moment hallway discussion. At the extreme, if there are no market-oriented predevelopment activities in a firm's NPD process, opportunity for salesforce NPD involvement would be minimal and presumably lower than in a firm with an extensive and formal NPD process. Therefore it can be expected that:

H2: The greater the formality of NPD processes, the greater the level of salesforce involvement.

NPD Cycle Time

The third organizational concept outlined in the Phase Two model (figure 6) relates the length of a product development cycle to salesforce involvement. Several studies have indicated diminished value associated with salespeople's information as time from concept to launch increases (Robertson 1962, Strub and Herman 1993). Pilot interviews revealed this as a tendency to view salesforce market understanding as limited to current markets and solutions, and of little value to NPD projects aimed at needs and customers not yet in existence. Therefore:

H3: The greater the NPD cycle time, the lower the salesforce involvement.

Personal Variables

Personal variables are those attributes that vary from individual to individual within a firm's salesforce. They can range from personality traits that are difficult to modify, to work tools that are easily provided or removed. Both pilot study interviews and related literature suggested several conceptual variables that may relate to the level of NPD involvement for an individual salesperson. As with the organizational variables, each of these concepts will be discussed, and the associated hypothesis presented.

Communication Enablers

The first concept involves communication enablers that serve to facilitate communication both locally and remotely. Access to an electronic (computer-based e-mail) mail or a voice store-and-forward (voice mail) system enable the salesperson to communicate and be involved in various NPD predevelopment activities without being physically located with the NPD functional groups. The other communication enabler, physical office proximity to the NPD functional group offices, acknowledges that "face-to-face" communications are still preferred in many information transfer activities.

Studies on field sales communications have shown strong association between providing the salesforce with computerized communication systems, and their willingness to transfer both solicited and unsolicited knowledge to the firm (Moncrief, Lamb, and Mackay 1991, Grove, LaForge, Knowles, and Stone 1992). The issues of enablers and proximity suggest the following hypothesis regarding the availability of electronic communication enablers and traditional physical proximity as correlates with salesforce involvement:

H4: The greater a salesperson's employment of communication enablers, the greater the involvement. Specifically, communication enablers are measured by:

- a: Access to electronic mail,***
- b: Access to a voice mail system,***
- c: Usage of electronic mail,***
- d: Usage of a voice mail system,***
- e: Proximity of a salesperson's work location to the NPD location.***

Customer Orientation

Without exception, each respondent in the pilot study discussed the importance of a salesperson's perception of his customer relationship as a key motivator for taking the time to be involved in predevelopment activities. Senior management in particular, noted that not all salespeople regard the customer relationship as

understanding future needs in addition to fulfilling current sales opportunities. Several salespeople also indicated they were more skilled in understanding the “bigger picture” of a customer’s requirements than some of their co-workers.

This notion of sensitivity and awareness of the salesperson for ongoing customer satisfaction and partnership has been extensively investigated by Robert Saxe (1979, 1984). He developed a scale, customer orientation or SOCO, that measures this variable as to what degree a salesperson regards his customer’s long-term needs while in the selling process. The antithesis of customer orientation is a selling orientation, whereby the salesperson is totally focused on a one-time sale, with little regard for the underlying needs of the customer.

In developing his scale of fifteen items, Saxe observed that the SOCO measure also correlated with both a salesperson’s advocacy of his customer to his firm and his self-perception of greater communication of customer needs to his firm. Siguaw, Brown and Widing (1994) also noted in their research that the greater the boundary spanning role of a salesperson, the higher their customer orientation, i.e. SOCO score. The inclusion of a customer orientation measure is important to this study. It captures the intensity of an individual salesperson to promote the customer perspective over a

firm's internal view of market requirements. Therefore, the predictor model includes the hypothesis:

H5: The greater the salesperson's customer orientation, the greater the involvement.

Knowledge of Firm's NPD Process

The more comfortable one is in understanding an institution or procedure, the more likely one is to be involved with that entity (Leuthesser 1991). Likewise, the more a salesperson understands the players and processes of NPD, the more likely the salesperson will take the initiative to become involved in predevelopment activities. During the pilot study interviews, one of the most revealing questions asked of the salesforce was "how do you submit a new product idea to the firm". Clearly, those who knew, whether by an informal or formal procedure, also implied they were active in submitting ideas to the company.

Several measures relate to this concept of familiarity and understanding of how NPD works at a firm. The first is overall experience of a salesperson. The new hire is less likely to know how to be involved in NPD activities than someone with greater seniority. The age and education level of a salesperson may also relate to greater understanding of NPD in a business. Older salespeople have an increased opportunity to have experience in NPD processes than

someone that recently entered the workforce. Likewise, higher education levels also provides for increased opportunities to learn about NPD processes and activities.

Membership on any NPD taskforce or committees implies a greater knowledge of the NPD process than someone who has never been part of such groups. Pilot study interviews with NPD people indicated that salespeople were usually recruited to serve on such committees because of their superior knowledge of NPD processes and issues. The pilot study also revealed a tendency for salespeople that understood where new product ideas where evaluated in a company to be contributors to NPD idea generation and evaluation effort. These findings lead to the following hypothesis with regard to the concept of a relationship between involvement and knowledge of a firm's NPD procedures and players:

H6: *The greater the salesperson's NPD knowledge, the greater the involvement. A salesperson's NPD knowledge is measured by:*

- a:** *Sales experience.*
- b:** *Salesperson's age.*
- c:** *Salesperson's education level*
- d:** *Membership on NPD committees.*
- e:** *Understanding of how to communicate predevelopment - related information to NPD functions.*

Relationship with NPD

The final hypotheses of the Phase Two study model (figure 6, page 38) relates to the relationship an individual salesperson has with the NPD process. Such a relationship is defined as the experiences and perceptions an individual has in transferring information to a firm's NPD function. Related literature on information gatekeeper theory (Dougherty 1992, Macdonald and Williams 1993, 1994), boundary spanning in organizations (Tushman and Scanlan 1981, Lysonski 1985) and market research relationships (Moorman, Deshpande, and Zaltman 1992, 1993) yields two aspects to this construct. The first is that feedback is an important motivator, and the second that a boundary spanner is more likely to contribute information if he believes the data will be evaluated fairly.

Although information gatekeeper and boundary spanning theories focus primarily on the transfer of technical information from the environment into the firm, the literature does confirm the importance of feedback as a motivator in information transfer. Macdonald and Williams (1993) note that so-called information gatekeepers, i.e. boundary spanners in an organization that have access to external information, are likely to increase information transfer when feedback is consistently given to them. Feedback ranges

from an informal thank-you to rewards for products developed, but gatekeepers expect at a minimum, the firm's acknowledgment of communications.

Also important as a motivator for involvement is the information provider's perception of the integrity and subject knowledge of the information recipients. Moorman, Deshpande, and Zaltman found this as even a stronger correlate of information transfer than trust between the groups. Likewise boundary spanning theory suggests that when external information is of little value to a gatekeeper (salesperson), motivation to transmit the information is highly dependent on the gatekeeper's belief that the information is of value to the intended recipient (Macdonald and Williams 1993, 1994). Furthermore, perceptions of information value to others is believed to vary widely across individual gatekeepers.

The pilot study also substantiated the ideas from the literature. Questions specifically addressing motivators of salesforce involvement identified feedback as key to stimulating future communication. Two respondents stated it was a requirement for them to receive feedback before sending information to NPD functions a second time. Salesforce respondents also indicated they had little interest in activity

participation they did not believe their involvement was either valued or respected.

Together, the notion of feedback from NPD and belief in appropriate information usage constitute cues for indicating to the salesperson the value of his contribution to NPD processes. The final hypothesis of the Phase Two model is derived from this notion that a salesperson's perceived value to NPD influences his level of involvement. Specifically:

H7: The greater the salesperson's perception of his/her value to NPD functions, the greater the involvement. Explicitly, this perception is measured by two variables:

- a: Feedback from NPD functions regarding a salesperson's information contribution.***
- b: Belief that a salesperson's contribution is acted on by NPD function.***

The above hypothesis denotes two variables as the specific correlates of salesforce involvement. The first variable representing the existence of feedback on information provided to the firm, is determined by a single survey item question. However, the more complex variable, salesperson's belief that the information provided will be evaluated and used appropriately by the NPD function, does not

have a pre-existing measure. Consequently, a scale for the perceived use variable is constructed as part of this study.

Control Variables

In addition to the organizational and personal variables identified in the Phase Two model, other organizational attributes may relate to salesforce involvement. Consequently, data collection includes the organizational demographics of company size and customer-channel served by the salesforce. These variables are not considered part of the Phase Two model because they are exogenous in the sense they are outside of a firm's personal and cultural system. The choice of control variables in the model is limited to those believed to be most relevant to salesforce involvement in NPD predevelopment activities.

Summary of Hypotheses

The following is a summary of the hypotheses offered in this study:

The degree of salesforce involvement in NPD predevelopment activities is positively impacted by:

H1: Stronger relationships between departments in a firm.

H2: Greater formality of a firm's NPD processes.

H3: Shorter NPD cycle time for a firm's products and product improvements.

H4: A salesperson's employment of communication enablers.

H5: Greater salesperson customer orientation.

H6: Greater salesperson NPD knowledge.

H7: A salesperson's perception of his/her greater value to NPD functions.

Measures for the above are:

H1:

a: Interdepartmental conflict.

b: Interdepartmental connectedness.

H4:

a: Access to electronic mail.

b: Access to a voice mail system.

c: Usage of electronic mail.

d: Usage of a voice mail system.

e: Proximity of a salesperson's work location to the NPD location.

H6:

a: Sales experience.

b: Salesperson's age.

c: Salesperson's education level.

d: Membership on NPD committees.

e: Understanding of how to communicate NPD-related information.

H7:

a: Feedback from NPD functions on a salesperson's contribution.

b: Belief that a contribution is acted on appropriately by the firm.

CHAPTER III

SCALE DEVELOPMENT

This chapter describes the procedures by which scales for measuring two study variables, salesforce *involvement* in NPD predevelopment activities (termed INVOLVE) and salesperson's belief that his contribution is appropriately addressed by NPD function (termed BELIEF), were developed. The development process included interviews and background readings to serve as a basis for item generation, a series of expert and salesperson surveys for item evaluation, and a survey of salespeople to select the most homogenous set of items. The chapter concludes with a description of each scale and its characteristics, including consistency and factor structure.

Methodology

A written survey, filled out by salespeople, was chosen as the means to measure BELIEF and INVOLVE. This method is more appropriate than direct observation as it assumes the salesperson has the most accurate perspective of his participation and perception of

information transfer activities pertinent to NPD processes. Self-reporting does carry the possibility of inaccurate self-perception, but arguments can be made for both upward and downward bias. Furthermore, since this instrument was administered to subjects anonymously and for research purposes only, there was little reason for intentional bias in survey responses.

The proposed procedures for instrument development described by Nunnally (1978) guided the process from item pool to final survey. Nunnally's approach assumes there is an infinite population, or domain, of items measuring an attribute. The test designer must select a sample of these items which represents the major aspects of this domain. Evaluations of how well a test accomplishes this are defined as assessments of content validity.

In practice, expert judges are often used to rate the adequacy of an initial pool of items for its content validity. In this process, the researcher develops the initial item pool, being careful to include items based on a clear understanding of the content universe, i.e. the definition of the intended construct. Following assessments of content validity, items are dropped or added to create a more representative measure of the variable.

This study's scale development steps, based on Nunnally's model, is outlined in figure 7. The process for the scale development questionnaire is represented in detail in Appendices A-G. The process began with the generation of items pools for each measure. Next, two rounds of surveys were conducted to choose the best set of the generated item pools for scales to measure INVOLVE and BELIEF. In the first survey round, the items were rated by a panel of professors and experienced sales managers. Ratings were on the degree which these items represent their intended constructs, and low-rated items were revised or eliminated.

Figure 7. Sequence of steps for scale development.

In the second survey round, the items were evaluated by a sample of professional salespeople. Their criteria for item selection was individual item clarity and relevancy to the overall scale. Ambiguous or confusing items were dropped, and the remaining items integrated into a final survey for analysis of scale dimensions and consistency. The final scale products were used as measures for the variable of study, INVOLVE, and a hypothesized predictor, BELIEF, used in testing the Phase Two study model.

Item Generation and Selection

Based on readings, the pilot study results, and follow-up interviews with salespeople, two pools of items were generated for scale development. The first pool pertained to items representing salesforce involvement in predevelopment activities (see Appendix A). The second pool was for scale development of the construct representing salesforce belief that their involvement is acted on appropriately or evaluated in the new product development process (see Appendix B). The items in each of these pools were developed for use in Likert-type instruments, with 5-point scale scoring.

The first step in developing these item pools for scale development was to obtain a clear understanding of the construct based on a review of literature (Churchill 1979). Cooper's work (1983, 1986, 1988), outlines NPD predevelopment activities from a process perspective and includes such items as market assessment, idea generation, and a detailed market study. Other literature suggests types of information that the salesforce could provide that would be of value in early NPD (Evans and Schlacter 1985, von Hippel 1988, Rochford and Wotruba 1993). Such literary perspectives were represented throughout the items (Appendix A) for measuring physical salesforce involvement in predevelopment activities.

Items that represented the cognitive aspect of involvement were drawn from the consumer research literature of Peter and Olson (1994). From their perspective, involvement is indicated by the degree an individual associates mentally or “is interested” in NPD activities. Research by Bloch (1980) on measuring consumer involvement provides several scale items that were adapted to this study, and serve to differentiate between salespeople their interest levels in NPD.

Although BELIEF and INVOLVE pools both consist of Likert-scale items, the two constructs differed in their response format. Most of the items generated for the salesforce involvement construct are concerned with behaviors rather than attitudes. As such, the always-never format is most appropriate. The second construct, belief in information usage, was represented by items that measure attitudes and is more fitting to agree-disagree representation.

The findings from literature on the elements of salesforce involvement were also validated with the pilot study interviews of business people involved in sales or new product development. These fifteen structured interviews included specific questions on the topic of salesforce involvement in predevelopment activities of NPD. Subjects were asked at the beginning of the interview to limit their comments of salesforce involvement to the NPD steps of idea generation, market

needs assessment, and features definition. The subjects were then asked to discuss how the salesforce is or can be involved in activities that are part of these phases.

Summarized excerpts from these interviews are provided in Appendix C. Several broad categories of activities emerged as logical groupings for respondents' comments including meeting participation, customer interface, idea communication, idea screening, market intelligence and features definition. The development of the item pool for INVOLVE (Appendix A) was based on producing questions that would address each of the identified activity groups. In addition, both positive and reversed items were written to encourage respondent's careful thought on each item response.

Development of the item pool for the scale of BELIEF (Appendix B), or a salesperson's belief that his involvement is valued and evaluated by the firm, was addressed in a similar fashion. Literature on information gatekeeper models and information transfer identified the importance of perceived organizational usage of information as a prime motivator for providing information (Tushman and Scanlan 1981, Macdonald and Williams 1993).

Additional support for the development of the BELIEF scale was found in the research of Macdonald and Williams (1993). They rejected

the theory of organization power as a motivator of an information boundary spanner. Instead they found, when external information is of little value to a boundary spanner, information transfer into the organization is influenced most by the perception that the information will be evaluated and used. A salesperson is more likely to transfer knowledge to the NPD process when he believes it will be used appropriately for the good of the firm.

Literature regarding the role of trust in using market research information also proved valuable in item generation for the proposed BELIEF measure. Although the definition of trust in this literature implies a stronger bond between two parties than this study's notion of belief, the subscales developed to measure information utilization and the involvement of the information provider in research activities were useful (Moorman, Zaltman, and Deshpande 1992). These published construct scales were adapted to measure the notion of salesforce belief in information utilization as used in this research study.

Informal interviews and discussions were conducted with five sales professionals to further generate insight into this measure of belief of information usage. Excerpts from these interviews are given in Appendix D. These comments also suggested that a salesperson's degree of involvement in information generating activities is affected by

his perception of how the organization values and uses the salesperson's information. There may exist an altruistic sense of duty to become involved in predevelopment activities, but the greater consideration is whether a salesperson's contribution is given serious consideration in NPD processes. Unlike the market research staff, the salesforce's primary job is to sell today's product, not gather information on tomorrow's needs.

Survey of Experts

A survey of experts on salesforce behavior was used in assessing how well the generated items represented the BELIEF and INVOLVE concepts. The sample for this survey consisted of two types of experts: seasoned sales managers, and marketing professors with notable interests in the dissertation topic. Surveys were sent to five sales managers and five marketing professors. All responded, providing an 100% response rate.

The survey sent to the expert judges is given in Appendix E. It consists of definitions of salesforce involvement in NPD predevelopment activities, and salesforce belief that their contribution to NPD processes would be appropriately evaluated by their firm. The response scale for the survey consisted of three alternatives. An item could be rated as C

(clearly representative of the concept), S (somewhat representative), or N (not representative). In addition, the expert judges were asked to make comments and suggest additional items where appropriate.

Expert Ratings

Ratings by both managers and professors were similar, with managers rating the items as slightly less representative of the concepts. Ratings for the individual items are given in Appendix F, and were calculated by assigning three points for “C” rating, two points for an “S”, and one point for a “N”. In addition, write-in comments for a particular items were also recorded. None of the expert judges suggested additional items for the two scales.

Items for the INVOLVE pool that were rated “N” by three or more judges and had an overall average score of below 2 were dropped. The elimination process for items in the BELIEF pool differed because of the overall higher rating of items. Consequently, items that had an overall average rating of 2.1 or less, and were rated “N” by two or more judges were eliminated. Seven INVOLVE and six BELIEF items were dropped from the pools through this process, leaving 33 items in the INVOLVE pool and 12 for BELIEF.

Salesforce Screening

In the second survey procedure, the remaining items for measuring BELIEF and INVOLVE were administered as a survey to ten salespeople representative of a typical industrial salesforce. The salespeople were selected from three local firms, and represented a broad range in age, sales experience, and education. Respondents were asked to read the items, identify items that seemed ambiguous or confusing, and recommend modifications to improve survey readability.

Items were eliminated from the item pools if two or more salespeople identified the item as difficult to answer, and there were no suggested modifications to the specified item. Using this process, an additional three items were dropped from the INVOLVE item pool, bringing the total number of items down to 30. The BELIEF pool was reduced by two items, with 10 items remaining. All items that were dropped through the two-survey process are denoted with shading in Appendix F.

Scale Development Survey of Salespeople

The purpose of this next salesforce survey was to select the final set of items for the two scales, i.e. a measure for salesforce involvement in NPD redevelopment activities (INVOLVE), and a measure for degree

of belief the salesperson has that contributions to NPD will be used appropriately by the firm (BELIEF). In this survey, the pool of items that were highly rated by experts and understandable by the salesperson panel was given to a large sample of salespeople. The resulting data was then used to select those items that best produced a scale that was internally consistent, parsimonious, and valid.

Scale Development Sample

The population selected for the scale development survey was defined as salespeople in industrial and high-technology enterprises in the United States. Although the research study is focused on high technology companies, the creation of a more broad-based scale will be of greater value in subsequent research. Consequently, the decision was made to widen the sample to include industrial companies. Literature also indicated that categorization of industrial and industrial high-tech firms frequently blurred because of rapid increases in the computerization of many manufacturing processes (Shanklin and Ryans 1984).

Item analysis in this study required a sample size of approximately 150 respondents, as directed by the five-to-one ratio of respondents to items recommended by Nunnally (1978). In order to

support that level of participation, the sample frame included three companies: In Focus Systems, IBM - Oregon Region, and the Camcar Division of Textron Corporation. All three firms were approached through personal visits and phone calls, with participation sponsored by senior executives.

Data was collected from the respondents through an anonymous response survey instrument, provided in Appendix G. Each member of the participating firm's salesforce received a survey packet through the mail. The packet included a cover letter, instructions, and mailing envelopes for returning completed surveys directly to the researcher. Confidentiality was assured and documented in the cover letter to each survey recipient. Of the 175 surveys mailed, 136 were completed and returned for a survey response rate of 78%.

Item Analysis Procedure

Once the target number of completed surveys were received, the next objective in this phase of scale development was to use the survey data to reduce the number of scale items to a smaller set. By selecting those items from the survey that were highly correlated, the resulting item set was deemed internally consistent and a representative measure of a single construct (Churchill 1979). In general, this is an

iterative purification process, involving use of correlations to select items and group into factors that were further examined using factor analysis.

The factor analysis step of scale development determined the scale structure the BELIEF and INVOLVE scales. Nunnally (1978) suggests investigation of the factorial composition of scales after they are constructed, and not using exploratory factor analysis to construct them. Consequently, after the items were reduced to an internally-consistent instrument, the remaining survey data was used in an exploratory factor analysis.

BELIEF Scale

As previously discussed, the first step in item analysis for the BELIEF scale was examination of the ten-item correlations and their internal consistency as indicated by Cronbach's coefficient alpha (Cronbach 1951). The data from this analysis, displayed in Appendix H, depicts all intercorrelations as significant at the .03 level. These results suggested that the ten-item scale set was representative of a single construct. The scale development process then proceeded to analysis of scale reliability and structure.

The alpha value of .92 for the ten-item scale exceeded Nunally's (1967) acceptable criteria range of .5 to .6. In the interest of efficiency, items with the lower item-total correlations were discarded, and a new scale alpha calculated. Scale structure was examined during this iterative process using exploratory factor analysis to examine the dimensionality of each scale permutation. All scale combinations examined with exploratory factor analysis displayed a single factor using the eigenvalue > 1.00 criterion.

The final scale selected for the BELIEF measure consisted of five items. These five items, listed in Table III with their item-total correlations, produced an alpha measure of .89. This final five-item scale not only provided a more parsimonious set of items, but maintained a relative balance between negative and positive worded items. Efforts were not made to reduce the scale below five items to ensure ample variability in the measure.

TABLE III
FIVE ITEM BELIEF SCALE ($\alpha = .89$)

Item #	Statement	Item-Total Correlation
5	<i>In this company, the salesforce is not respected as a source for new product ideas.</i>	.75
7	I am viewed as an important source of market information about new products and features that should be developed by my firm.	.68
8	I am confident that the new product development group uses information they receive from me wisely.	.77
9	<i>My views are not considered in new product plans.</i>	.76
10	<i>The new product development group's use of my feedback on new products is only superficial.</i>	.73

Reverse-worded items are italicized.

Acceptable Cronbach's alpha range is $\alpha > .50$ to $.60$

The five-item scale structure was also examined using principal components analysis with varimax rotation. Using the eigenvalue > 1.00 criteria, only a single factor was extracted. However, the factor explained 70.2% of the scale variance, indicating a strong degree of unidimensionality within the final five-item scale. The varimax rotated factor matrix and associated communalities are displayed in Table IV.

TABLE IV
FACTOR MATRIX - BELIEF SCALE
(SINGLE FACTOR EXTRACTED)

Item Num.	Single Factor Loadings	Communalities
5	.8463	.7162
7	.7922	.6275
8	.8600	.7397
9	.8579	.7361
10	.8320	.6921

INVOLVEMENT Scale

There were no a priori premises for the underlying factor structure of INVOLVE as measured by the proposed scale. As previously discussed, the literature suggests salesforce involvement could contain dimensions of formality of involvement, solicited versus unsolicited involvement, or division based on the stage in predevelopment activities. This last case, for example, would suggest a factor that correlates highly to items involving idea generation, and another to those items concerned with assessment of existing ideas.

The absence of established theories regarding the underlying structure of INVOLVE, supports the use of inter-item correlations to look for possible subscales within the measure. This check ensures that the assumption of a unidimensional set is not violated when scale reliability is measured using Cronbach's α (Gerbing and Anderson

1988). Such assumed subscales can be analyzed for consistency and structure using the same process outlined in figure 7. Once subscale assessment was completed, the procedure for developing a final scale for the INVOLVE measure followed the measure purification process used in developing the BELIEF scale.

A number of the survey respondents gave unsolicited feedback that several of the INVOLVE items were confusing or ambiguous. It was decided to weigh item comments along with item intercorrelations into an initial step of filtering problem items from the final pool. Items that did not form into a subscale and had negative respondent feedback were eliminated from the item pool. Correlations of .3 or greater, in addition to supporting theory, were used as a criteria for determining subscale clusters.

Subscale Analysis

The thirty item correlations are listed in Appendix I. Eleven of the thirty items, noted by shading in Appendix I, were eliminated from the item pool because of low correlations and negative feedback. The remaining 19 items were then examined for subscale relationships based on the Phase One model (fig. 5 on page 33) of possible multidimensionality in the INVOLVE measure. Six subscales (A, B, C,

E, F, and G) were extracted from this process, and are denoted with their correlations in Table V.

TABLE V
ZERO ORDER CORRELATIONS FOR
SIX SUBSCALES OF NINETEEN-ITEM INVOLVE SCALE

Item	A 1	A 2	A 3	A 5	A 24	B 14	B 21	B 23	C 8	C 12	E 16	E 7	E 27	F 11	F 9	F 6	G 26	G 29
A1	1.0																	
A2	.49	1.0																
A3	.57	.44	1.0															
A5	.54	.41	.54	1.0														
A24	.46	.33	.41	.46	1.0													
B14						1.0												
B21						.52	1.0											
B23						.38	.47	1.0										
C8									1.0									
C12									.66	1.0								
E16											1.0							
E7											.60	1.0						
E27											.34	.33	1.0					
F11														1.0				
F9														.49	1.0			
F6														.39	.44	1.0		
G26																	1.0	
G29																	.48	1.0
G30																	.30	.41

All correlations significant at the .03 level

Negative worded items (#7, 9, 11, 30) are reverse-scored

The underlying rationale for each subscale is:

Subscale A:

NPD-initiated formal activities

Subscale B:

NPD-initiated less formal or market research activities

Subscale C:

Salesperson-initiated transfer of qualitative NPD data

Subscale E:

Salesperson-initiated transfer of competitive new product data

Subscale F: Degree of NPD-initiated communication with salesforce

Subscale G: Cognitive involvement indicators

A seventh, or D subscale was initially considered, but later combined with subscale A because of similarities in rationale and relationships between the two subscales.

The next step in the subscale development process was to test the suggested subscales for internal consistency using Cronbach's alpha, and to explore the subscale structures. Exploratory factor analysis using varimax rotation revealed single dimensions for all subscales. The six subscales also displayed acceptable levels of internal consistency as indicated by their Cronbach alpha values, shown in Table VI, compared to Nunnally's (1967) acceptance criteria of .50 to .60. The results of exploratory factor analysis of each subscale are also displayed in Table VI.

TABLE VI

SUBSCALE INTERNAL CONSISTENCY AND STRUCTURE

Subscale-Item (Question #)	Internal Alpha	Consistency Item-Total Correlation	Subscale Single Factor Variance Explained	Structure Communality
A	.8074		58%	
1		.68		.67
2		.53		.48
3		.64		.63
5		.63		.62
24		.52		.47
B	.7180		64%	
14		.54		.63
21		.60		.71
23		.49		.58
C	.7914		82%	
8		.66		.82
12		.66		.82
E	.6904		62%	
7		.60		.71
16		.60		.72
27		.38		.44
F	.7046		63%	
6		.48		.58
9		.56		.68
11		.53		.63
G	.6569		60%	
26		.46		.59
29		.55		.70
30		.42		.51

Survey responses for the 19 items were next summarized along the six subscales, resulting in composite variables A, B, C, E, F, and G comprising the INVOLVE scale. The measure purification process of calculating inter-subscale correlations, assessing internal consistency, and exploring factor structure was then applied to the six element scale. The goal of this effort was to examine the subscale relationships and combine any subscales that measured similar aspects of the involvement construct.

Inter-subscale correlations, exhibited in Table VII, suggested

TABLE VII
INTER-SUBSCALE CORRELATIONS

Subscale	A	B	C	E	F	G
A	1.00					
B	.52*	1.00				
C	.42	.47*	1.00			
E	.18	.24	.52*	1.00		
F	.56*	.48*	.33	.16	1.00	
G	.36	.22	.37	.20	.31	1.00

*p<.01

strong relationships between subscales A, B, and F, and also between C and E. These correlations, all greater than .45, are shaded in the table. Principal components analysis also indicated three possible dimensions to the six subscale measure, ABF, CE and G. Table VIII

presents the varimax rotated factor matrix resulting from the factor analysis.

TABLE VIII
VARIMAX ROTATED FACTOR MATRIX

Subscale	Factor 1 (ABF)	Factor 2 (CE)	Factor 3 (G)	Communality
A	.789	.116	.277	.713
B	.795	.306	-.082	.732
C	.377	.741	.237	.747
E	.026	.917	.052	.844
F	.808	.029	.199	.693
G	.182	.162	.947	.956
Explained Variance (cumulative)	47.1%	64.7%	78.1%	

To extract the third factor, the eigenvalue criteria was set at $\geq .8$. With a two factor solution, obtained when the eigenvalue criteria was ≥ 1.0 , subscale G was equally weak in its loading score for either factor. In addition, there was theoretical support for isolating G as a third factor since the items in the G subscale reflected pure cognitive involvement as opposed to the physical or activity-based involvement behavior measures used in the other subscales items.

The three emergent factors in the INVOLVE scale can be interpreted as follows:

FACTOR 1 (ABF): NPD - headquarters initiated activities to extract NPD-oriented knowledge from salespeople.

FACTOR 2 (CE): Salesperson initiated activities for NPD-oriented knowledge transfer to NPD - headquarters.

FACTOR 3 (G): Salesperson cognitive interest in NPD.

Factors 1 and 2 relate to the solicited-unsolicited dimension suggested in the proposed Phase One study model (figure 5, page 33). Factor 3 is supported by literature suggesting that involvement is both a cognitive and a physical behavior.

These three factors became the basis for final subscale definition in the INVOLVE measure. Subscale ABF consisted of eleven items from the A, B, and F subscales. Subscale CE included the five items used to create subscale C and E, while the G subscale remained unchanged with three items. Final subscale analysis of internal consistency using Cronbach's α revealed levels of .86 for the eleven-item ABF subscale, and .78 for the five item CE subscale.

In summary, the measure purification process for the INVOLVE item pool resulted in the selection of nineteen items, forming three subscales for this measure. Each subscale demonstrated acceptable internal consistency as measured by Cronbach's alpha, and significant ($p < .05$) inter-item correlations. A summary of each subscale including item definition and key statistics is reiterated in Table IX.

TABLE IX
INVOLVE MEASURE - SCALE SUMMARY

Subscale - Item #	Statement	Item-Tot Correl.	Item Mean	Item St.Dev.
ABF NPD - Headquarters Initiated Activity				
A1	I participate in new product brainstorming sessions.	.66	2.37	.98
A2	I am asked to forecast sales for products that are still in development.	.52	2.83	1.01
A3	I participate in meetings that evaluate new product ideas or features.	.53	2.49	.87
A5	I am asked for my opinion on new product ideas.	.71	2.88	1.02
A24	Evaluating product prototypes are part of my job.	.50	2.18	1.16
B14	I am involved in design of customer surveys on new product requirements.	.56	1.93	1.12
B21	I participate in market research that evaluates needs for new product ideas.	.53	2.40	1.19
B23	My firm asks me what I think of new product ideas or designs before they are developed.	.49	2.39	.98
F6	I am asked for suggestions on improvements on our products.	.59	3.17	1.00
F9	I don't communicate directly with people in new product development.	.57	3.52	1.11
F11	I have no knowledge of what product ideas are under evaluation in my firm.	.45	3.58	1.05
CE Salesperson Initiated Activity				
C8	I call or meet with the people in new product development when I have an idea for a new product.	.56	2.98	1.28
C12	I contact people in new product development when I hear about competitive new product or product improvements.	.68	3.59	1.22
E7	When I hear a rumor about a new competitive product from my customers, I keep it to myself.	.56	4.43	.93
E16	If I attend a trade show, I inform my company about any new competitive products I see or hear about.	.59	4.01	1.16
E27	It's important for me to pass on to my firm any new product ideas.	.43	4.40	.75
G Cognitive Involvement				
G26	I would like to contribute in a group that develops new products.	.45	3.67	.82
G29	I can make an important contribution to my firm's new product development efforts.	.55	3.88	.87
G30	My input has little value to new product decisions at my firm.	.42	3.78	1.01

Scale Validity

The final step of the scale development process was to address validity of the proposed scales. Scale validity is an evaluation of whether a scale measures what it is designed to measure. For scales measuring psychological traits, establishing validity is not a binary decision but rather a process of evaluating the scale in numerous studies and situations (Allison 1978). Consequently, this study provided only an initial validity assessment.

For the INVOLVE scale, validity was assessed using data from a second involvement measurement question (Appendix J). This alternative measure question was administered to the salespeople as part of their survey packet. The question asked for relative amount of salesperson's time spent on new product development activities as compared to time on selling existing products, customer satisfaction issues, travel, and territory reports / forecasts. Each respondent assigned individual categories a relative weight, with the sum of the weights adding up to 100.

Scale validity was indicated by calculating the correlation, as measured by Pearson's product moment correlation or r , between the weight assigned to new product activities, and the each of the three subscales of INVOLVE . Correlation values significant at the .05 level or

greater would indicate a reasonable level of subscale validity. All three subscales correlated significantly at the .05 level with the alternative measure of percent of time spent on NPD activities. Subscale ABF displayed the strongest relationship with $r = .49$, while CE and G exhibited correlations of .34 and .40 respectively.

The process for assessing validity of the BELIEF scale differed from that used for the INVOLVE scale. Churchill (1979) suggested another approach to validity is whether the scale can discriminate between groups that differ on a related trait. In the Phase Two study model, the independent variable BELIEF is hypothesized to correlate significantly with the variable of study, INVOLVE. The outcome of testing this hypothesis can provide an initial validity assessment of the BELIEF scale.

CHAPTER IV.

RESEARCH METHODS

This chapter contains the research methodology and design of the exploratory investigation of the hypothesized Phase Two model (figure 6) found on page 38. The Phase Two model proposes a number of relationships between salesforce involvement and selected organizational and personal-level concepts. This chapter presents the relevant aspects of testing the model's relationships as stated in the study's hypotheses on page 50. Included are discussions of research design, sample, data collection process, measures, and analytical procedures used to test the research hypotheses.

Research Design

The Phase Two model depicts a systems view of salesforce involvement in NPD activities. As such, the model investigates the behavior of the criterion variable, salesforce involvement, from two perspectives. The first perspective (figure 8) established the business organization as the unit or level of study. Relationships between the

degree of involvement for a firm's salesforce, and the organization characteristics of *interdepartmental dynamics*, *NPD formality*, and *NPD cycle time*, are observed with each firm serving as a single subject.

SALESFORCE INVOLVEMENT: ORGANIZATION AS THE UNIT VIEW

Figure 8. Organization view of Phase Two research model.

The second perspective views the salesperson as the unit of study as depicted in figure 9. At this level, a salesperson's relative degree of involvement in NPD activities is related to characteristics of the salesperson: *NPD knowledge*, *degree of customer orientation*, *self-perceived value to NPD functions*, and *use of communication enablers*.

From this perspective, each member of a firm's salesforce becomes a feasible study subject.

**SALESFORCE INVOLVEMENT:
SALESPERSON AS THE UNIT VIEW**

Figure 9. Personal view of Phase Two research model.

The two-perspective, or systems, view of salesforce involvement depicted in the Phase Two model framed the research design. The variable of interest, *involvement* in NPD predevelopment activities, was measured and analyzed as a group measure representing a firm's salesforce and as a measure associated with an individual salesperson.

This approach facilitated the testing of the proposed hypotheses, and is consistent with the study's second and third research questions:

Research Question #2

How do organizational attributes relate to the degree of salesforce involvement in NPD?

Research Question #3

How do the personal characteristics of salesperson relate to degree of involvement in NPD predevelopment activities?

A field survey was conducted to test the Phase Two model-based hypotheses. The overall focus of this research was to gain a greater understanding of salesforce involvement in NPD predevelopment activities. As discussed in the previous chapter, involvement contains both attitude and behavioral components and is influenced by personal and environmental factors. Consequently, to gain insight as to why salesforce involvement varies, it was decided to study the phenomenon from the perspective of the firm and in particular, a firm's salespeople.

The decision for a cross-sectional rather than longitudinal research design was based on practical concerns. In order to evaluate relationships at the firm level, a number of organizations needed to participate in the research. A multi-firm, multi-salesperson sample prohibited the ability of a researcher to observe the hypothesized relationships over time. In addition, the physical disbursement and

travel schedules of a typical industrial firm's salesforce, necessitated the use of self-administered data collection in the research design.

Sample

The population selected for testing the research model was the same as defined for scale development: high-technology and industrial firms in the United States with an employee salesforce. High technology and industrial companies were selected for study. By definition, they experience the greatest turmoil in NPD due to quick changes in technology and market requirements (Dunn and Thomas 1990). Consequently, such firms should be more sensitive to the need for understanding market requirements early in the NPD process.

The sampling frame, as outlined in Table X, was salespeople and NPD personnel in 19 high technology and industrial firms. Each firm was approached through either personal phone call or visit. In most cases, the company contacts were a senior sales manager and a human resources representative. Each contact received an information packet (Appendix K) following the initial phone call or visit. Then, a follow-up phone call or visit was made to determine interest, sponsorship, and answer any questions regarding the survey or survey process.

TABLE X

SAMPLE FRAME FOR PHASE TWO SURVEY - PARTICIPATING FIRMS

Firm Name	No. of Salespeople Completing a Survey	NPD Participants
ADC Kentrox	10	2
Blount (OCS division)	12	1
CAMCAR	19	1
Cascade Manufacturing	17	2
ELCO	18	1
ESCO	16	1
Hyster	5	1
IBM (San Francisco)	17	1
Infomedix	12	1
Mentor Graphics	11	1
Merix	12	1
Microsoft (Los Angeles)	13	2
Oracle (western sales region)	13	2
Protocol	14	1
Raychem (industrial division)	15	2
Sequent	10	1
Sun (western sales region)	13	1
Tektronix (printer division)	11	2
Warn	10	1
TOTAL Firms = 19	N = 248	N = 25

To participate in the study, a firm was required to sell high-tech or industrial products and employ a salesforce of at least fifteen full-

time employees. In addition, each company pledged a minimum of ten completed surveys in order to provide an adequate sample size for analysis of organizational variables. Thirty firms were contacted. Eight were eliminated because of low salesforce size and three declined to participate. The result was a firm response rate of 63% for this phase of data collection.

Data Collection Procedures

Two separate instruments were used for data collection. The first, a self-administered survey packet (see Appendix L) was distributed to a firm's salesforce. The second, (see form outlined in Appendix M) was completed either in person or through a phone interview with a member of the firm's New Product Development (NPD) team. If the NPD team member was not able to answer the questions because of uncertainty in responses or lack of NPD cycle time data, then two or more NPD team members were interviewed to ensure reliability of responses.

Salesforce data collection was conducted over a five month period in 1995. Once sponsorship was established, the firm provided names and business mailing addresses for their salesforce. The survey packets, including cover letter and stamped, self-addressed return

envelope, were then mailed to the salespeople. Care was taken in the cover letter to assure respondent anonymity and affirm company sponsorship. Of the 305 salesforce survey packets mailed, 248 were completed and returned. With 81% of distributed surveys completed and returned, no follow-up measures were taken.

Measures

An index of measures and their components used in testing the study's various hypotheses is contained in Appendix N . Whenever possible, established measures were employed for the variables in the study hypotheses. All of the criterion and predictor variable measures, except NPD cycle time, were collected from the Phase Two salesforce questionnaire (Appendix L). NPD cycle time was collected through an interview process that collected information outlined in Appendix M.

The criterion variable, salesforce involvement, was measured by the nineteen-item Likert scale, termed INVOLVE, that was developed in the study. These nineteen items were grouped into three subscales: NPD-headquarters initiated activity, salesperson initiated activity, and cognitive involvement with NPD. Each subscale was regarded as a distinct dependent variable in hypothesis testing. An alternative measure for salesforce involvement, used to test validity in Phase One

study scale development, was also collected in Phase Two for re-testing of scale validity. This validity measure is noted in Appendix N as a self-perceived measure of time spent on new product development activities compared to other job-task categories.

Organization-level Predictor Variables

The study's hypotheses support four predictor variables at the organizational level, each requiring measurement for testing association with the criterion variable. The first two, interdepartmental conflict (CONFLICT) and interdepartmental connectedness (CONNECT), are dimensions of the concept of interdepartmental dynamics as it relates to salesforce involvement. The degree of CONFLICT and CONNECT was each assessed using a five-item scale modified from measures developed by Kohli and Jaworski (1985).

Formality of NPD processes, the next organizational predictor variable, was measured using a single categorical item. The measure is taken from the salesperson's perception, an interpretation consistent with the study's cognitive definition of salesperson's involvement in NPD activities. The response was coded as an ordinal variable with higher values indicating a higher degree of formality in the NPD process.

NPD cycle time was the only variable collected from members of an organizations NPD or R&D team. The study sponsor provided names of individuals either in R&D, marketing (product management), or engineering who were most knowledgeable on the timeframe for product development. Data collection was accomplished by the researcher via phone or personal interview with the NPD respondent. If two or more NPD team members were interviewed in a firm, the average of the responses became the firm's score.

Personal-level Predictor Variables

The personal-level variables contained in the study hypotheses were analyzed at the individual or salesperson level. A greater number of personal-level measures were examined in Phase Two research analysis than organization-level measures. The operationalized predictor variables contained in the personal level hypotheses ranged from single scale score, to a combination of interval and ordinal measures. Each of the four personal level hypothesis and their associated measures are listed in Appendix N. The variables: communication enablers, customer orientation, NPD knowledge, and perceived value of salesperson contribution to NPD - constitute the

hypothesized predictor variables at the individual-level of the study model.

Communication Enablers. A salesperson's employment of communication enablers was measured through five variables: access to an electronic mail system, access to a voice mail system, usage of electronic mail, usage of voice mail, and distance between a salesperson's work and the NPD team locations. Access to electronic mail and voice mail systems were each quantified by a dichotomous yes-no variable. Usage measures of electronic mail and voice mail communication systems were defined by a Likert-scale measure of the degree that the respondent salesperson used each of these enablers to communicate with staff or headquarters personnel. The measures were assessed for their relationship with the criterion variable as distinct variables and as an aggregated variable.

The study viewed face-to-face communications between a field salesperson and the NPD team as being more likely enabled by small or no distances between their respective locations. A salesperson and NPD team co-located in the same building, provides greater opportunities for direct communication than if they are a thousand miles apart. An ordinal variable measured this distance between the salesperson and NPD team through survey response categories of:

located in the same building, different buildings on the same campus, different office campuses but less than 50 miles apart, and office locations separated by a distance of greater than 50 miles.

Customer Orientation. An adaptation of Saxe's (1979) Selling Orientation - Customer Orientation (SOCO) scale was used to measure the degree to which a salesperson was oriented to the wants and needs of his customer. The nine-item behavioral scale features a five-point scale ranging from never (1) to always (5), and includes statements such as, "I try to get my customers to discuss their needs with me". The scale score was treated as an interval measure of a salesperson's inclination to service the customer over his own need to meet sales quotas.

NPD Knowledge. A salesperson's degree of knowledge of NPD processes and purpose was determined through five items. The first three measures, sales experience, age and education level were treated as ordinal variables. Each of the variables were measured by responses to ordered categories rather than capturing nominal information such as age in years or months of sales experience. The three measures were chosen to indirectly assess the NPD knowledge which one may have gained through job experience or schooling.

Another indication of NPD knowledge is whether the salesperson has served on NPD committees, a dichotomous measure captured in the salesforce survey. The fifth and final gauge of a salesperson's NPD knowledge is the degree to which he(she) knows where to send ideas for new products or product improvements. This indicator was measured with a single item response on a five-point "never (1) - always (5)" scale to the statement, "I know where to send in the company any ideas for new products or product improvements" .

Perceived Value to NPD. The last predictor variable, a salesperson's perception of his value to NPD functions, was determined by two measures. The first one, belief that NPD information supplied is used appropriately by the firm, is the five-item BELIEF scale that was earlier developed as part of this study. An additional 5-point scale item denotes the relative amount of feedback that a salesperson has received from NPD after providing information to them.

Control Variables

Two control variables, company size and direct sales customer type, were measured at the organizational level. Data for company size was based on 1995 revenues for the entire firm as reported in annual reports. One company, Warn Industries, is a private corporation. In

this atypical case, annual sales revenue data were obtained from estimates reported in the July, 1995 issue of *Oregon Business*. The company revenue data was coded into three categories, as described in Appendix N, to create an ordinal variable. However, the Phase Two model relationships were tested using the sales revenue control variable in both coded and raw (ratio measure type) formats.

Information regarding the type of customers served through the company's direct salesforce was obtained from interviews with the company's study sponsor or other sales executive. Responses were codified into three groups of "customers" that the salesforce currently calls on. Consequently, the variable measure for type of customer was defined as a categorical variable with its value based on the salesforce selling to final consumers, intermediates, or both.

Analytic Procedures

The overall purpose of the Phase Two analysis was to operationalize and examine the study hypotheses. Published research at the time of this study did not establish measures for a number of concepts presented in the hypotheses. Consequently, a significant part of the analytical procedure included evaluating the behavior of the proposed measures with respect to the Phase Two study sample. The

Phase Two analytical procedure, presented in figure 10, summarizes the process for evaluating measures used to operationalize the hypotheses, and for testing the hypotheses.

A final step of the Phase Two analytical process was to test the overall Phase Two model. The variable measures that tested significant association with either involvement subscale were grouped as a set of predictors. Multiple regression was then used to assess the relationship of the measures as a set of predictors to determine the unique contribution of a variable within the overall Phase Two model.

Figure 10. Phase Two model analytical procedures.

Analyses were limited to the measures utilized in the study hypotheses, and the two control variables. Before testing the seven hypotheses, variable measures were assessed for consistency and reliability. As in the Phase One scale development process, Cronbach's coefficient alphas were computed for the multi-item measures: belief NPD uses salesperson information appropriately, SOCO, interdepartmental connectedness, interdepartmental conflict, NPD-initiated salesforce involvement, salesforce-initiated involvement in NPD activities, and cognitive involvement in NPD. Alpha statistics were used to evaluate internal consistency before testing hypotheses. Descriptive statistics such as: sample means, standard deviations, and response frequencies were also calculated for variable measures as appropriate to the research.

For the criterion variable INVOLVE, inter-item correlations for each of the subscales were used to assess the consistency of structure as compared to Phase One sample data. In addition, scale validity was re-examined using the alternative measure for salesforce involvement in NPD activities. Analyses for validity and consistency of the INVOLVE subscales were conducted at both individual and organization levels.

To enhance clarity, the testing of hypothesis first analyzed the organizational level (Hypotheses 1 through 3) and then the personal level relationships (Hypotheses 4 through 7). Organization-level variables were constructed by defining each firm's response as the mean value of the measure for all survey respondents at each firm, creating a sample size of $N=19$. Personal-level variables were measured on an individual survey basis providing a sample size of 248.

Organization-Level Hypotheses

As a preliminary step to hypothesis testing, each organizational variable collected at the individual level was assessed for variability between the 19 firms. A one-way analysis-of-variance (ANOVA) procedure was used on the firm averages of each of the variables. Statistically significant differences were indicated by F-tests at the total sample level, and by Tukey-B tests for examining significant differences between pairs of firms. The distribution of data values for each variable were also examined to make sure there were no outliers or coding mistakes.

Pearson-product moment correlations were calculated to explore overall relationships of the organization-level variables that were interval measures. Association for the ordinal variable, NPD process

formality, was measured using two rank-order correlation coefficients: Kendall's tau-b and Spearman's rho. Correlation coefficients were examined on a pair-wise basis between each independent variable and the dependent subscale measures as a test of the study's three organizational-level hypotheses. As a final step, partial correlations between predictor variable measures and the INVOLVE subscales were calculated while suppressing influences of one or both of the control variables.

Personal-Level Hypotheses

Variable measures for the personal-level hypotheses ranged from dichotomous to interval variables. Consequently, testing the significance of the four hypothesized relationships varied according to variable type. In all cases, final hypothesis testing was conducted using a relative measure of relationship between the independent variable measure and each INVOLVE subscale. For the ordinal variable measures, Goodman and Kruskal's gamma was used as the association statistic. The remaining interval type variables were tested for association with the INVOLVE subscales using Pearson's product moment correlation coefficient.

Prior to testing the individual level hypotheses, cross-tabulations were computed on ordinal and nominal variables. Cell populations for each firm were examined for variability and to check for individual level variables that should be further analyzed at the organizational level. Data exploration using stem-and-leaf plots were also conducted as a preliminary step to hypothesis testing.

Summary

Table XI is a summary of each measure and its key characteristics that were presented in this chapter. The first column lists each measure as associated with either a criterion, predictor or control variable. An “X” in either the second or third column indicates whether the measure was collected as a firm’s salesforce attribute or a salesperson trait. The “Measure Code Name” column refers to the abbreviated name used in data analysis to represent the particular measure.

The last two columns of Table XI describe the composition of the measures used in this study to operationalize the seven hypotheses. Each measure is classified in the fifth column of Table XI as one of four levels of measurement: nominal, ordinal, interval or ratio. Entries in

the last column of the table denote the number of survey question items used to create the corresponding measure.

TABLE XI

SUMMARY OF STUDY MEASURES AND THEIR CHARACTERISTICS

Measure	Measured as Organization Variable	Measured as Individual Variable	Measure Code Name	Level of Measure- ment	# of Items in Measure
<i>CRITERION</i>					
NPD-initiated Salesforce Involvement	X	X	INV-ABF	interval	11
Salesforce-initiated Involvement	X	X	INV-CE	interval	5
Cognitive Involvement	X	X	INV-G	interval	3
<i>PREDICTOR</i>					
Interdepartmental Conflict	X		CONFLICT	interval	7
Interdepartmental Connectedness	X		CONNECT	interval	7
NPD Formality	X		FORMAL	ordinal	1
NPD Cycle Time	X		CYCLE	interval	2
Access to e-mail		X	ACC-EMAI	dichot- omous	1
Access to voice mail		X	ACC-VOIC	dichot- omous	1
E-mail Usage		X	USE-EMAI	interval	1
Voice mail Usage		X	USE-VOIC	interval	1
Proximity to NPD		X	PRX-NPD	ordinal	1
Customer Orientation (SOCO Scale)		X	SOCO	interval	9
Sales Experience		X	EXPER	ordinal	1
Age		X	AGE	ordinal	1
Education		X	EDUCA	ordinal	1
Committee Member		X	COMMITT E	dichot- omous	1
NPD Communication		X	NPD-COM	interval	1
Belief in Usage of Information		X	BELIEF	interval	5
NPD Feedback		X	FEEDBAK	interval	1
<i>Control</i>					
Size (Sales \$)	X		SALES	ordinal	1
Customer Type	X		CUSTOM	nominal	1

CHAPTER V

ANALYSIS OF RESEARCH FINDINGS

This chapter discusses the results of testing the Phase Two study model of predictors of salesforce involvement in NPD predevelopment activities as outlined in figure 10 on page 95. First, general characteristics of the organization-level sample are provided including means and frequency distribution for study measures. Characteristics of the total sample measured at the salesperson level are also discussed. Next, individual statistical test results for the organizational-level hypotheses (H1 - H3) are reviewed. This is followed by the presentation of testing results for the individual-level hypotheses (H4 - H7). A summary of all hypotheses test results is provided at the conclusion of the chapter.

There were two objectives in the analysis of Phase Two data. The first objective was to examine the behavior of the study's variable measures for the sample. This analysis was valuable in filtering out irrelevant data before hypothesis testing. In addition, the presentation of this study's sample characteristics is a significant contribution to

the limited existing research (Angur 1991) on the linkage between salesforce and NPD.

The second objective of analysis was to test the Phase Two model hypotheses. The first three hypotheses:

H1: The stronger the relationships between departments, the greater the degree of salesforce involvement.

H2: The greater the formality of NPD processes, the greater the degree of salesforce involvement.

H3: The shorter the NPD cycle time, the greater the degree of salesforce involvement.

propose a significant association between characteristics of an organization, and the degree of involvement the organization's salesforce has in NPD predevelopment activities. The next four hypotheses:

H4: The greater a salesperson's employment of communication enablers, the greater the degree of involvement

H5: The greater the salesperson's customer orientation, the greater the degree of involvement.

H6: The greater the salesperson's NPD knowledge, the greater the degree of involvement.

H7: The greater the salesperson's perception of his value to NPD functions, the greater the degree of involvement.

explain the association between characteristics of a salesperson, and the salesperson's degree of involvement in NPD predevelopment

activities. These hypotheses were assessed through statistical tests of association between the specified variable measures.

Characteristics of the Sample

The two perspectives of the Phase Two model (figures 8 and 9), segmented the examination of variables in the context of their behavior within the appropriate study level. The first perspective observes independent variable means and distribution at the organization (n=19) view of the sample. The second perspective considers the overall sample of individual salespeople (n=248). Variable analysis then proceeded to behavior of the criterion variable subscales also at organization and individual levels. From this examination, several variable measures were modified or eliminated before hypotheses were tested.

Many of the firms that participated requested that they not be identified in specific survey results. In particular, data such as length of NPD cycle, salesforce education and experience, and NPD involvement measures were considered by several companies as competitively sensitive information. Consequently, firms are identified by alphabetic codes in Tables XI - XV discussed in the following section.

Sample Characteristics of Firms

Data were collected from nineteen industrial and high-tech firms that varied in 1994 sales revenues from \$40 million (Protocol) to \$65 billion (IBM). Although the majority of firms (twelve) were located in Oregon, five firms had international salesforce representation, eight provided a national respondent base, and only four organization salesforce samples were restricted to western U.S. territories. The number of survey respondents per firm ranged from 5 to 19, the mean response size was 13, and the mode and median were each 12 respondents.

Information regarding allocation of a salesperson's worktime was collected as context for the study of salesforce involvement in NPD pre-development activities and as an indication of involvement subscale reliability. Of particular interest was the percent of time spent on NPD activities in relation to time spent selling, training, completing administrative tasks, and improving customer satisfaction. As implied by Table XII, salespeople perceive a relatively small amount of their work time is spent on NPD-related activities. Individual firm averages on this score ranged from 2% to 20%. For the overall sample, selling

and improving customer satisfaction were reported as consuming the largest portions of a salesperson's time at 48% and 23% respectively.

TABLE XII
SALESPERSON SELF-PERCEPTION
OF TIME USAGE FOR PAST YEAR

Firm Code	Selling	NPD Activities	Resolving Customer Satisfaction	Paperwork, (Administrative)	Education & Training
A	50.9 %	4.9 %	24.1 %	8.2 %	11.8 %
B	48.9	3.8	24.6	9.3	13.3
C	55.0	3.2	24.3	5.4	12.1
D	50.4	5.2	24.4	8.1	11.9
E	42.8	7.8	22.2	15.1	12.2
F	43.1	9.7	16.5	15.4	15.3
G	41.0	3.0	34.0	13.0	9
H	42.7	7.5	21.0	12.5	16.2
I	53.5	7.8	13.0	13.2	12.5
J	51.7	13.4	17.1	11.2	6.7
K	43.8	20.8	18.8	10.0	8.0
L	40.8	6.0	26.5	17.7	9.1
M	38.5	2.4	31.3	11.8	16.1
N	64.4	2.8	14.0	10.0	8.8
O	44.7	2.3	26.0	12.7	14.2
P	52.1	4.3	21.8	13.2	8.8
Q	44.5	5.0	29.5	12.3	8.6
R	40.0	6.5	27.4	17.5	8.4
S	54.1	2.7	25.1	5.5	12.6
(N=248)					
Average	48 %	6 %	23 %	11 %	12 %

As exhibited in Table XIII, several variable measures showed great variance between firms on a means basis. Salesforce membership on a NPD team/task force ranged from none at several companies to half at one firm, with overall sample membership at 18%. Feedback given to a salesperson regarding new product ideas differed across companies from a mean low of 1.63 to 4.12, on a 1 (low) to 5 (high) scale. A similar pattern held for differences in an organization's salesforce knowing where to send information regarding new products. This firm-based mean ranged from 1.62 to 4.38. On a total sample basis, the average respondent indicated a greater likelihood of knowing where to send NP information (3.55) than receiving feedback on the information (2.63).

TABLE XIII
SELECTED CHARACTERISTICS FOR RESEARCH SAMPLE
(FIRM-LEVEL)

Firm Code	SOCO* MEAN (scale 1 - 5)	Belief input is used MEAN (scale 1 - 5)	Inter-depart Connct MEAN (scale 1 - 5)	Con- flict MEAN (scale 1 - 5)	Feed- back MEAN (scale 1 - 5)	Use voice mail to HQ MEAN (scale 1 - 5)	Use e- mail to HQ** MEAN (scale 1 - 5)	Know where to send ideas MEAN (scale 1 - 5)	Mem- ber of NPD Team (%)
A	4.57	3.02	3.55	2.85	2.83	4.33	4.44	3.22	33%
B	4.49	3.32	3.53	2.75	2.00	4.05	4.28	3.47	0
C	4.83	3.95	3.87	3.34	3.05	4.26	4.63	4.21	37%
D	4.55	3.05	3.56	2.84	2.88	4.35	4.41	3.24	12%
E	4.47	3.30	3.89	3.34	2.86	3.88	4.31	4.38	38%
F	4.29	3.03	4.10	2.47	1.92	3.15	4.77	3.54	15%
G	4.47	3.08	3.74	3.20	3.20	4.10	(20%) 4.00	3.20	0
H	4.46	2.58	3.78	2.82	1.90	4.01	(70%) 4.21	4.11	20%
I	4.62	3.51	4.04	3.30	2.80	3.95	4.00	3.80	0
J	4.57	3.27	3.86	3.22	4.13	4.05	4.33	4.06	33%
K	4.54	3.38	3.92	3.08	3.08	4.08	4.41	4.33	50%
L	4.40	4.03	3.81	2.92	2.84	4.31	4.62	4.08	8%
M	4.59	2.45	3.25	3.09	1.63	4.18	4.45	3.18	0
N	4.57	2.76	4.36	3.10	2.70	4.30	4.70	2.72	15%
O	4.35	2.77	3.79	3.73	2.62	5.00	5.00	1.62	0
P	4.81	2.41	3.44	2.70	1.79	4.29	(0%)	2.43	0
Q	4.64	2.05	3.57	2.47	1.82	4.36	4.09	2.90	19%
R	4.39	3.15	3.77	2.83	2.83	4.25	(58%) 3.92	4.08	9%
S	4.84	3.22	3.86	3.38	3.06	4.29	(0%)	4.29	35%
N=248 Avg.	4.56	3.11	3.76	3.07	2.63	4.19	(83.7%) 4.55	3.55	18%

* SOCO refers to measure of a salesperson-salesforce customer orientation

** E-mail access of less than 100% is noted in parentheses and italicized

Access and usage of electronic and voice mail systems

displayed relatively smaller differences than the above variable measures. All salespeople reported having access to voice mail, and the variable measure was consequently dropped from further study. Usage of voice mail to communicate to staff groups such as new product development teams (Table XIII) displayed relatively narrow differences between firm means ranging from 3.15 ("sometimes-often") to 5.00 ("always").

Fourteen of nineteen organizational salesforces reported having electronic mail access, three firms had mixed access, and two had no respondent access to electronic mail. On a total sample basis, over 83% of respondents had electronic mail access. Access to electronic mail was dropped from further analysis at the individual level, and did not display significant correlation to salesforce involvement subscales at the organization level. For the overall sample, usage of electronic mail to communicate was slightly higher (4.55) than voice mail usage (4.19) for those respondents that had access to both enablers.

Table XIV displays the categorical distributions of salesperson's age, experience and education for the firm's respondent sample, and for the total sample. Few respondents were under 30 years in age or had less than a year's sales experience. Eight firms reported no

salespeople with less than a bachelor's degree, with one firm providing a salesforce sample with 70% possessing a master's degree. The average sample respondent was most likely to be between 30 and 44 years in age (64%), with at least 4 years sales experience (71%), having earned a bachelor's degree as their highest level of education attainment (65%).

The ordinal measure of sales experience was positively associated with age ($r=.38$) and inversely related to level of education attained ($r=-.204$) as measured by Pearson correlation coefficients. Both statistics were significant at the $p<.01$ level of a two-tailed test. Age and education measures were also negatively associated, but not at a significant level. These results imply that the education level attained is higher for less experienced salespeople in the study sample of 248 respondents. Although there was no explicit hypothesis proposed in the study regarding the relationships between experience, education and age, the sixth hypothesis proposed these measures would vary directly with salesforce involvement.

TABLE XIV

FREQUENCY DISTRIBUTIONS FOR SELECTED STUDY VARIABLES:
AGE, SALES EXPERIENCE, AND EDUCATION

Firm Code	Age <30 yrs	Age 30 to 44	Age >44 yrs.	Exp. <1 yr	Exp. 1 to 3 yrs	Exp. 4 to 9 yrs	Exp. >9 yrs.	Educ H.S. & some college	Educ Bachl. Degree	Educ Mastr Degree
A	0 %	83 %	17 %	0 %	0 %	28 %	72 %	0 %	78 %	22 %
B	0	80	20	0	0	27	73	0	73	27
C	0	16	84	0	21	16	63	21	74	5
D	0	88	12	0	0	29	71	0	77	23
E	13	37	50	6	13	19	62	0	94	6
F	31	69	0	15	31	54	0	0	85	15
G	20	40	40	0	20	40	40	40	40	20
H	0	60	40	0	30	50	20	60	10	30
I	10	50	40	10	30	20	40	50	30	20
J	17	58	25	17	33	42	8	36	55	9
K	10	50	40	25	8	50	17	42	42	16
L	0	69	31	15	8	39	38	23	69	8
M	0	64	36	0	0	55	45	18	82	0
N	0	90	10	30	30	40	0	0	30	70
O	0	100	0	0	62	38	0	8	62	30
P	0	100	0	0	71	29	0	0	71	29
Q	0	82	18	0	55	36	9	0	64	36
R	0	67	33	17	8	42	33	25	67	8
S	0	12	88	0	24	12	64	23	71	6
Sample (N=248) Average	5 %	63 %	32 %	7 %	22 %	31 %	40 %	16 %	65 %	19 %

As indicated in Table XV, the great majority (78%) of salespeople reported office locations 50 miles or greater from their organization's NPD group site. It was decided to reclassify the measure as

dichotomous (< 50 miles, $\geq$ 50 miles) and test at the organization level for meaningful relationship to the salesforce involvement subscales. On this basis, the point-biserial correlation coefficient between distance and the involvement subscale ABF was -.60, and significant ($p < .01$) level. The corresponding statistic between distance and the CE subscale was -.47 and likewise significant ($p < .05$). This supports the conjecture that a salesforce located greater than a short drive from NPD, will be less involved with NPD activities than a salesforce located with or near NPD.

Over 96% of the sample perceived their organizations as having an NPD process. Table XV reveals that over half (55%) of the total sample described the NPD process as being formal, and eight company averages exceeding that response rate. Organization means for this measure ranged from no perception of a formal NPD process to all respondents indicating a formal process. There was no significant association between a salesperson's perception of a firm's formality of NPD process, and the size of the firm as measured by sales revenue. This absence of relationship infers that from a field-located employee perspective increased organization size does not necessarily imply increased formality in a staff function such as NPD.

TABLE XV

**FREQUENCY DISTRIBUTIONS FOR SELECTED STUDY VARIABLES:
SALESPERSON LOCATION AND FORMALITY OF NPD PROCESS**

Firm Code	Location: Same Building	Location: Campus to < 50 mi.	Location: 50 mi or greater	NPD Process Don't Exist	NPD Process In-formal	NPD Process Neither	NPD Process Formal
A	0 %	0 %	100 %	0 %	6 %	0 %	94 %
B	0	0	100	0	7	0	93
C	0	16	84	0	5	26	69
D	0	0	100	0	0	0	100
E	0	6	94	6	13	50	31
F	0	0	100	0	8	31	61
G	20	40	40	20	20	40	20
H	50	10	40	0	40	60	0
I	0	10	90	10	0	60	30
J	68	32	0	0	8	25	67
K	50	50	0	0	0	33	67
L	31	8	61	8	8	54	30
M	0	0	100	27	9	18	45
N	0	0	100	0	20	60	20
O	0	8	92	0	0	46	53
P	0	0	100	0	0	50	50
Q	27	18	55	9	18	36	37
R	33	0	67	8	8	59	25
S	0	12	88	0	6	29	65
Sample (N=248) Average	12 %	10 %	78 %	4 %	8 %	33 %	55 %

The length of time for NPD was measured from the perspective of the firm's NPD personnel, with one response recorded per firm. The results, exhibited in Table XVI, display a consistent difference in cycle

time between new products and product improvement. Despite wide differences between firms, overall sample cycle time categories have relatively even distribution between <7 months, 7 to 12 months, and 13 to 24 months for product improvements; and 7 to 12 months, 13 to 24 months, and > 24 months for new products. The consistent difference in NPD cycle time between product improvements and new products may stem from a firm classifying improvements versus new products based on time in NPD instead of a definition based on an external view of the degree of newness of the product.

TABLE XVI

FREQUENCY DISTRIBUTIONS FOR SELECTED STUDY VARIABLES:
NPD CYCLE TIME - NEW PRODUCTS AND PRODUCT IMPROVEMENTS

Firm Code	% Im- prove- ments < 7 mos.	% Im- prove- ments 7 - 12 mos.	% Im- prove- ments 13 - 24 mos.	% Im- prove- ments > 24 mos.	% New < 7 mo.	% New 7 to 12 mos.	% New 13 to 24 mos.	% New > 24 mos.
A	60 %	20 %	20%	20 %	20 %	30 %	30 %	20 %
B	50	50	0	0	10	40	25	25
C	75	25	0	0	0	50	50	0
D	5	20	75	0	0	25	50	25
E	75	25	0	0	50	50	0	0
F	50	50	0	0	10	30	30	30
G	10	40	40	10	0	25	50	25
H	30	30	30	10	0	30	40	30
I	25	25	25	25	5	20	25	25
J	50	50	0	0	25	25	25	25
K	75	25	0	0	5	15	40	40
L	10	25	35	30	0	25	25	50
M	10	30	60	0	10	30	30	30
N	20	30	40	10	0	20	40	40
O	15	25	50	10	0	15	35	50
P	25	50	25	0	5	20	50	25
Q	20	25	35	20	0	5	40	55
R	40	40	20	0	10	15	25	50
S	25	50	25	0	10	20	40	30
Sample (N=248) Average	37 %	34 %	24 %	5 %	9 %	27 %	35 %	29 %

note: shading denotes data for product improvements, no shading indicates new product data

The control variables, firm size and customer type (end-user, reseller, or both), were tested for association with a number of sample demographics at the firm level: NPD cycle time, interdepartmental connectedness, interdepartmental conflict, salesperson perception of time usage, NPD process formality, salesforce customer orientation, and usage of communication enablers. There were no significant associations between any of these variable measures and firm size, or customer type. This suggests that the sample tendency for a long (>50 miles) distance between salespeople and headquarters overrides possible firm-size influences on demographics such as interdepartmental dynamics or salesperson time allocation. The ubiquitousness of communication tools across the sample may also mitigate the resource leverage of a large firm to communicate to remote personnel over that of smaller firms.

Analyses were conducted to evaluate the degree to which the organization level hypothesized independent variables: interdepartmental conflict, connectedness and NPD process formality, discriminated between firms. Ideally, a variable to be tested for association with a firm's level of salesforce involvement would also vary significantly in its measure across firms. As exhibited in Table XVII, interdepartmental connectedness, conflict and NPD process had

significant ($p < .03$) F-ratio statistics implying each measure differed between firms.

TABLE XVII
ONE WAY ANOVA RESULTS:
DIFFERENCES BETWEEN FIRMS FOR SELECTED VARIABLES

Variable	F Ratio	F Probability	# of paired means significantly different at .05 (Student-Newman-Keuls)
CONFLICT	3.20	.00	11
CONNECT	1.78	.03	1
NPD Formality	4.09	.00	12

The Student-Newman-Keuls (SNK) paired difference statistic were calculated to determine the number of paired firm comparisons that were significantly different. Results indicate that interdepartmental connectedness measures were not significantly different between firms except for a single pair comparison. Although interdepartmental conflict and NPD process formality measures significantly differed between 11 and 12 pairs respectively, detailed data revealed the differences always included one of the same four firms. This indicates that although the three variables significantly differed in their measures across the nineteen firms, the difference was attributable to a few firms exhibiting a different behavior from the group norm.

Internal consistency of predictor variables formed from multi-item scales was also assessed before testing the association with salesforce involvement. The Cronbach's alpha test statistic for BELIEF in Phase Two of the study (Table XVIII) was comparable to the Phase One alpha reading of .88, indicating the same degree of consistency for the BELIEF measure as suggested in Phase One data analysis. The other three scale measures, CONFLICT, CONNECT, and SOCO were also evaluated for internal consistency using Cronbach's alpha test statistic. All three scale measures (Table XVIII) provided higher alphas for the study sample than the suggested (Nunnally 1967) guidelines of .50 to .60, indicating minimal scale error due to item content.

TABLE XVIII

TOTAL SAMPLE (N=248) MEAN, STANDARD DEVIATION, RANGE
FOR VARIABLES WITH SCALE MEASURES

Variable	Mean	Standard Deviation	Cronbach's Alpha	Range
BELIEF	3.11	.92	.88	1.00 to 5.00
CONFLICT	3.07	.66	.83	1.00 to 4.86
CONNECT	3.76	.68	.89	1.43 to 5.00
SOCO	4.57	.38	.92	3.11 to 5.00

Criterion Variable Subscale Analyses

Earlier in this study, three subscales for salesforce involvement:

- Involvement in NPD or headquarters initiated activities (INV-ABF),
- Salesperson initiated involvement (INV-CE),
- Cognitive involvement (INV-G),

were developed for measuring the criterion variable, salesforce involvement in NPD predevelopment activities. The next phase of empirical investigation focused on the reliability and consistency of the criterion subscales for the Phase Two study sample. Inter-item correlations and Cronbach's alpha statistic was calculated for the three subscales: INV-ABF, INV-CE, and INV-G, as indicators of scale consistency.

Based on results in Table XIX, subscale INV-G was eliminated from further analysis because the scale was not internally consistent for the Phase Two study sample. At the individual salesperson level ($n=248$), the INV-G subscale α of .26 was substantially below the acceptable range of .50 to .60 (Nunnally 1967). The organizational level ($n=19$) alpha statistic of .37 although higher, was still below acceptable levels. Such low alpha statistics indicate an unacceptably high potential for measurement error to come from scale content.

TABLE XIX

INTER-ITEM AND ITEM-TOTAL CORRELATIONS, AND ALPHA STATISTICS FOR INV-G* FOR INDIVIDUAL (N=248) AND FIRM (N=19) SAMPLES					
Item	A7 (G)	A15 (G)	A19 (G)	n=248 (total individual)	n=19 (company means)
A7 (n=248)	1.00			.12	.11
(n=19)	1.00				
A15 (n=248)	-.14	1.00		.02	.18
(n=19)	-.22	1.00			
A19 (n=248)	.32**	.14	1.00	.33	.53
(n=19)	.35	.35	1.00		
Cronbach's Alpha				.26	.37

* INV-G measures cognitive involvement.

**denotes significance at $p < .01$.

Lack of consistency was also indicated by inter-item correlations as measured by the Pearson product-moment correlation coefficient. While one item pair was significant at the $p < .01$ level for the $n=248$ sample, none were significant for the organization means sample. This finding prompted reexamination of the Phase One data using the Phase Two involvement subscale definitions to search for explanations for the G subscale difficulties. The Phase Two sample alpha and inter-item correlations were vastly different from the consistency measures for the Phase One sample. This behavior further suggested subscale G was inappropriate for measuring the cognitive aspect of involvement for the Phase Two sample.

Internal consistency statistics for the two other subscale measures, INV-ABF (Table XX) and INV-CE (Table XXI) exceeded the

acceptable threshold range (.50 - .60) for both n=248 sample ($\alpha=.84$ and $\alpha=.75$ respectively) and n=19 organization means sample ($\alpha=.93$ for both subscales). For subscale INV-ABF, items A5 and A9 had low item-total (Table XX) and inter-item (Table XXII) correlations; however, the remaining items displayed sufficient inter-item and item-total Pearson correlation coefficients. All inter-item correlations for subscale INV-CE were significant at the $p<.01$ level.

TABLE XX

ITEM-TOTAL CORRELATIONS, CRONBACH'S ALPHA FOR INV-ABF

Item	n=248 sample (individual surveys)	n=19 sample (Company Means)
INV-ABF α measure	.84	.93
A3	.56	.74
A4	.71	.35
A5	.20	.86
A6	.42	.77
A8	.63	.79
A9	.21	.47
A10	.72	.81
A11	.56	.75
A16	.56	.74
A17	.55	.75
A18	.62	.75

TABLE XXI
INTER-ITEM AND ITEM-TOTAL CORRELATIONS, AND ALPHA STATISTICS
FOR INV-CE* FOR INDIVIDUAL (N=248) AND FIRM (N=19) SAMPLES

Item	A1	A2	A12	A13	A14	n=248 (total individ'l)	n=19 (firm means)
A1 (n=248)	1.00					.50	.82
(n=19)	1.00						
A2 (n=248)	.34	1.00				.48	.78
(n=19)	.70	1.00					
A12 (n=248)	.27	.40	1.00			.41	.77
(n=19)	.69	.74	1.00				
A13 (n=248)	.39	.33	.29	1.00		.59	.83
(n=19)	.76	.66	.65	1.00			
A14 (n=248)	.45	.38	.28	.64	1.00	.64	.81
(n=19)	.77	.75	.69	.86	1.00		
Cronbach's Alpha						.75	.93

All the above correlations are significant at $p < .01$

*INV-CE measures salesforce initiated involvement in NPD activities.

TABLE XXII
INTER-ITEM CORRELATIONS FOR INV-ABF (NPD-initiated Involvement)
RESULTS FOR INDIVIDUAL (N=248) and FIRM (N=19) SAMPLES

Item #	A3	A4	A5	A6	A8	A9	A10	A11	A16	A17
A3	1.00 1.00									
A4	.59* .74*	1.00								
A5	.14 .23	.13 .21	1.00							
A6	.26* .62*	.32* .65*	.19* .49*	1.00						
A8	.41* .63*	.58* .73*	.10 .12	.34* .66*	1.00					
A9	.09 .48*	.11 .48*	.28* .12	.003 .31	.09 .43	1.00				
A10	.42* .56*	.63* .77*	.12 .23	.39* .63*	.58* .64*	.21* .65*	1.00			
A11	.38* .65*	.48* .63*	.17* .46*	.34* .69*	.55* .73*	.11 .35	.42* .48*	1.00		
A16	.31* .56*	.46* .71*	.07 .20	.32* .67*	.43* .76*	.17* .33	.61* .76*	.30* .48*	1.00	
A17	.48* .66*	.46* .81*	.06 .25	.25* .61*	.40* .63*	.19* .30	.43* .58*	.32* .67*	.36* .49*	1.00
A18	.44* .45*	.57* .66*	.01 .24	.29* .52*	.44* .30	.10 .45	.57* .83*	.43* .63*	.49* .58*	.51* .60*

Correlations denoted in bold, italicized type are for firm (n=19) sample.

* denotes significance at $p < .01$

Both the INV-ABF and INV-CE criterion subscales had significant ($p < .01$) F-ratios across organization means. The Student-Newman-Keuls statistic indicated INV-ABF had 14 pairs of firms with significant differences in means. Subscale INV-CE registered 59 pairs of organization means that were significantly different. These results suggest that the subscales differ across firms, and the level of salesforce involvement as measured by either subscale is significantly different for a number of firms.

Concurrent validity of the INV-ABF and INV-CE measures was tested and supported using the alternative measure of self-perceived time spent on NPD activities. The association between the two subscales and the perceived time spend on NPD activities was measured using the Pearson product-moment correlation statistic. Table XXIII displays the Pearson correlation statistic value and its significance for the association between measures at the individual level and organization level of the sample. INV-ABF correlation coefficients ($r = .578$, $r = .363$) were significant at the $p < .01$ level and INV-CE results ($r = .396$, $r = .138$) were significant at the $p < .05$ criteria. These results support an assumption of validity for the two remaining subscale measures for salesforce involvement (INV-ABF, INV-CE).

TABLE XXIII

RELIABILITY STATISTIC:

SUBSCALE CORRELATION with TIME SPENT ON NPD ACTIVITIES

Criterion Subscale	Correlation for n=248	Correlation for n=19
INV - ABF	.36 **	.58 **
INV - CE	.14 *	.40 *

*one-tailed significance $p < .05$ ** one-tailed significance at $p < .01$ Organizational Predictors (H1 through H3)

The three organizational hypotheses all involved directional relationships between selected variables and the salesperson involvement subscales. Table XXIV provides the Pearson correlation coefficients for the variable measures indicated in Hypotheses 1, 2 and 3. A measure for interdepartmental relationships was developed by adding the interdepartmental connectedness and conflict scores. Likewise, a general measure for cycle time was obtained by adding scores for the improvement and new product cycle time variables.

TABLE XXIV

ORGANIZATION-LEVEL CORRELATION COEFFICIENTS (N=19)

Variable	INV-ABF	INV-CE	Inter-depart CONFLICT	Inter-depart CONNECT	Inter-depart (Both)	Cycle Time Improve	Cycle Time New	Cycle Time (Both)	NPD Formality
INV-ABF	1.00								
INV-CE	.67**	1.00							
CONFLICT	.01	-.02	1.00						
CONNECT	.12	.15	.47*	1.00					
CONNECT CONFLICT (both)	.07	.06	.88	.83	1.00				
Cycle Time Improve	-.42*	-.36	-.13	-.16	-.15	1.00			
Cycle Time New	-.28	-.41*	-.31	-.09	-.20	.53*	1.00		
Cycle Time (both)	-.41*	-.44*	-.24	-.15	-.11	.90**	.85	1.00	
NPD*** Formal.	.09	-.13	.01	.11	.14	-.39*	-.20	-.35	1.00
Distance from HQ	-.60**	-.47*							

* One tailed test, significance $\leq .05$,

** One tailed test, significance $\leq .01$

*** Spearman correlation coefficients

Shaded cells support organization level hypotheses

Significant inverse relationships were supported for the involvement subscale ABF and cycle time for product improvements ($r = -.42$, $p \leq .05$), and the involvement subscale CE and cycle time for new products ($r = -.406$, $p \leq .05$). Overall NPD cycle time varied inversely

with both subscales ($r = -.405$ and $r = -.437$, $p \leq .05$). Significant relationships were also noted for the dichotomous measure of salesperson distance from NPD location and the two involvement subscales, although this relationship was not hypothesized for the organization-level of the Phase Two model.

Relationships, as indicated by Pearson product-moment correlation coefficients, were not significant between either involvement subscale and the measures for interdepartmental conflict, interdepartmental connectedness or the sum of the interdepartmental variable measures. Association between the ordinal variable, NPD process formality, and the involvement subscales was not supported as measured by the Spearman's rho correlation coefficients. An additional relationship not hypothesized in the study but supported by the analysis concerned cycle time for product improvements and salesforce perception of NPD formality ($\rho = -.389$, $p \leq .05$). This implied that the longer a firm's cycle time for product improvements, the less likely the salesforce would be to perceive the NPD process as formal.

A second round of analyses was conducted controlling for the size of firm and type of customers called on by the salesforce. Neither controlling for one or both of these variables altered the significance of correlation coefficients. An additional test of correlation significance

was conducted using the raw company annual sales figures as a control variable rather than sales ranges as categories. This substitution of ratio measure for the ordinal measure of company sales did not produce significantly different results. In short, at the organization level of analyses, use of control variables for company sales and type of customers did not impact study results.

Personal Predictors (H4 through H7)

Personal level hypotheses were tested using Pearson correlation coefficients for dichotomous, interval and ratio scaled variables associations, and the Gamma statistic for evaluating ordinal variable relationships with involvement subscales. Table XXV provides the Pearson coefficients for variable measures pertaining to salesperson involvement activities, communication enablers, customer-orientation, and perception of value to NPD process. Relationships proposed in Hypotheses 4, 5, and 7 were tested with these statistics.

TABLE XXV

INDIVIDUAL-LEVEL (N=248)
PEARSON PRODUCT MOMENT CORRELATION STATISTICS

Variable	INV-ABF	INV-CE	SOCO	Use v-mail	Use e-mail	Use Both	Locate NPD	Feed-back	Belief	Feed& Belief
INV-ABF	1.00									
INV-CE	.49**	1.00								
SOCO	.13*	.24**	1.00							
Use V-Mail	.07	-.054	.15*	1.00						
Use E-Mail	.09	-.04	-.14*	.18**	1.00					
Use Both	.11*	-.06	.00	.58**	.90**	1.00				
Location to NPD	.26**	-.31**	.06	.08	-.02	.03	1.00			
FEED-BACK	.11*	.13*	.17**	.06	.04	.06	.03	1.00		
BELIEF	.61**	.43**	.21**	.06	.21**	.20**	.03	.28**	1.00	
Feed & Belief	.34**	.28**	.19**	.07	.12*	.13*	.03	.92**	.63**	1.00

* One tailed test, significance $\leq .05$

** One tailed test, significance $\leq .01$

Shaded cells support personal level hypotheses

Two of the communication enabler measures, Access to E-Mail and Access to Voice Mail, were dropped earlier in the study. All the salespeople in the study had access to voice mail and all but a few had access to electronic mail. Of the remaining enabler measures, there were no significant relationships between Usage of E-Mail, Usage of Voice Mail and either of the involvement subscales. However, the additive combination of electronic mail and voice mail usage did correlate significantly at the $p \leq .05$ level ($r = .107$) with the INV-ABF

subscale. The remaining communication enabler, location distance from salesperson to NPD, related inversely on a significant basis to the involvement subscale ABF ($r = -.258$, $p \leq .01$) and subscale CE ($r = -.310$, $p \leq .01$) as hypothesized. It was noted earlier in this chapter that distance also related inversely to involvement at the organization means ($n=19$) model level.

The relationship between the involvement subscales and salesforce customer orientation was significant with INV-ABF ($r = .132$, $p \leq .05$), but stronger with INV-CE ($r = .241$, $p \leq .01$). Significant correlation statistics were also obtained for all combinations of the perception of value measures. The feedback measure (FEEDBACK) directly related to involvement subscale ABF ($r = .108$, $p \leq .05$) and CE ($r = .127$, $p \leq .05$) as did the scale measure for salesperson belief (BELIEF) that their NPD input would be used appropriately ($r = .609$, $p \leq .01$ and $r = .431$, $p \leq .01$ respectively

A multiple regression model using independent variables BELIEF and FEEDBACK was tested against both involvement subscales. This analysis was used to investigate the unique contribution of either perception of value measure while controlling for the other measure. In this model, FEEDBACK did not have a significant relationship with either involvement subscale when BELIEF was in the model. This

result suggested that significant relationship between FEEDBACK and involvement is accounted for in the broader association between BELIEF and involvement subscales, and BELIEF and FEEDBACK

Table XXVI contains the statistics for assessing the significance of relationships between salesperson NPD knowledge and involvement in NPD activities as proposed in study Hypothesis 6. Five separate measures for selected aspects of salesforce knowledge were each tested for association with involvement subscales. The gamma statistic was used to test association for the three ordinal variables: age, education attained, and experience. The remaining hypothesized relationships involving membership on a NPD team, and salesperson understanding of where to send NPD information were tested with Pearson's product-moment correlation coefficients.

TABLE XXVI

RELATIONSHIP STATISTICS FOR INDIVIDUAL-LEVEL (N=248) HYPOTHESES		
Variable	INV-ABF Subscale	INV-CE Subscale
<i>Goodman and Kruskal's Gamma statistic</i>		
Experience	.13	.105
Age	.05	.22**
Education	-.23**	-.25**
<i>Pearson product-moment correlation coefficient</i>		
Member of NPD Team	.26**	.27**
Know where to send NPD ideas in organization	.17**	.27**
* One tailed test, significance < .05		
** One tailed test, significance < .01		
Shaded cells support personal level hypotheses		

Membership on a NPD team related significantly to involvement subscale INV-ABF ($r=.259$, $p \leq .01$) and INV-CE ($r=.267$, $p \leq .01$) as did the measure for understanding where to send NPD information ($r=.167$, $r=.273$, each at $p \leq .01$). Education level attained associated with involvement subscales ABF ($\gamma=-.225$, $p \leq .01$) and CE ($\gamma=-.245$, $p \leq .01$), but on an inverse basis rather than direct as hypothesized. A salesperson's age category varied only with the INV-CE subscale ($r=.218$, $p \leq .01$), while a salesperson's experience level did not associate with either involvement subscale.

The inverse association between education level attained and the involvement subscales added further insight into the previously

discussed inverse relationship between education and the age and experience measures. Additional analyses on the relationship between education level and other independent variables revealed inverse relationships between education level and all model variables except the measure for distance between the salesperson's office and NPD function ($r=.148$, $p<.01$). Significant inverse associations with education level were noted for the SOCO measure ($r=-.149$, $p<.01$), organization knowledge ($r=-.119$, $p<.05$), and BELIEF ($r=-.129$, $p<.05$).

The inverse relationship between level of education and other study variables was not anticipated in the design of the study. Prior research suggested that higher education attainment levels for a salesperson would support greater awareness and understanding of NPD processes and in turn a higher degree of involvement. Instead, higher education for this sample associates with a less experienced, younger employee that is less likely to have developed strong customer orientation and beliefs that his/her input is valued by the firm.

The above analyses present a number of predictor variables that associate significantly with the involvement subscales at the personal level ($n=248$). Multiple regression analyses (Table XXVII) were conducted to determine the unique contribution of the predictor variables to involvement relationship when other study variables were

taken into account. Multiple regressions were performed for each criterion subscale, in addition to a final analysis using a single criterion variable as a consolidation of the two involvement subscales. Standardized regression coefficients or β 's were calculated to determine the strength of a predictor-criterion variable relationship when the relationship of other study variables is accounted for.

Of all the predictor variables, BELIEF has the largest unique relationship with either sales-initiated ($\beta=.32$) or NPD-initiated ($\beta=.57$) dimensions of involvement. The distance between a salesperson's location and NPD also has a significant association with either dimension of involvement, $\beta=.19$ for both subscale models. Beyond these two predictor variables, the differences in the composition of the involvement subscales becomes evident. Salesforce-initiated involvement relates significantly to additional factors of customer-orientation ($\beta=.11$), NPD team membership ($\beta=.13$) and knowledge of where to send NPD-related information ($\beta=.21$). For NPD-initiated involvement, other significant associations are indicated for age ($\beta=.12$) and experience ($\beta=.11$).

The complex relationship between age, experience, education level and other study variables is reflected in the full models. In these analyses, age becomes negatively associated with NPD-initiated

involvement. This suggests that the categories chosen for age may be too broad to provide a consistent interpretation of this variable of its relationship with involvement.

TABLE XXVII
MULTIPLE REGRESSION RESULTS FOR
INDIVIDUAL-LEVEL MODEL

Predictor	NPD-Initiated Involvement (INV-ABF)	Sales-Initiated Involvement (INV-CE)	Consolidated Involvement Subscales
R² for Model	.67	.59	.71
BELIEF	.57***	.32***	.52***
Feedback	.00	.00	.02
SOCO	.00	.11*	.03
Team Member	.09	.13*	.13**
Organization	.09	.21***	.18***
Knowledge			
Age	-.12*	-.01	-.11*
Experience	.11*	.04	.11*
Education	-.07	-.10	-.08
Distance from NPD	-.19***	-.19**	-.21***

n=248; coefficients are standardized regression coefficients.

* p<.05

** p<.01

*** p<.001

Summary (All Hypotheses)

In this chapter, analyses of variables based on the Phase Two sample, and results of hypotheses testing were presented. The

following is a summary of the empirical findings within the context of the evaluating the study's hypotheses.

H1: The stronger the relationships between departments, the greater the level of salesforce involvement. Interdepartmental relationships are measured by the variables:

a: Interdepartmental conflict.

b: Interdepartmental connectedness.

Hypothesis 1 is rejected. No support was found for either measure or the additive relationship of measures on either NPD involvement subscale.

H2: The greater the formality of NPD processes, the greater the level of salesforce involvement.

Hypothesis 2 is rejected. No support was found for this hypothesized relationship.

H3: The greater the NPD cycle time, the lower the salesforce involvement.

Hypothesis 3 is accepted, as supporting statistics were found for this hypothesized relationship. Cycle time for new products was significantly associated with salesforce involvement subscale INV-CE, and cycle time for product improvements was significantly associated with subscale INV-ABF. The combined variable measure of cycle time for new product and product improvements was related significantly to both involvement subscale measures.

H4: *The greater a salesperson's employment of communication enablers, the greater his involvement. Specifically, communication enablers are measure by:*

- a:*** *Access to electronic mail,*
- b:*** *Access to a voice mail system,*
- c:*** *Usage of electronic mail,*
- d:*** *Usage of a voice mail system,*
- e:*** *Proximity of a salesperson's work location to the NPD location.*

Sub-hypothesis 4e is accepted and sub-hypotheses 4a, 4b, 4c, and 4d are rejected based on statistical results in the study. The usage of either voice or electronic mail systems was not significantly associated with involvement subscale INV-ABF or subscale INV-CE. Although, the combined measure for usage of both electronic mail and voice mail was directly related to subscale INV-ABF. Proximity of a salesperson's work location to the NPD location was directly related to each involvement subscale. The remaining two variable measures: access to electronic mail and access to voice mail, were deleted from the study because of insufficient variability across the study sample.

H5: *The greater the salesperson's customer orientation, the greater his involvement.*

Hypothesis 5 is accepted as statistical support was found for this hypothesized relationship. The degree of customer orientation related directly to both involvement subscales.

H6: *The greater the salesperson's NPD knowledge, the greater his involvement. A salesperson's NPD knowledge is measured as:*

- a:*** *Sales experience.*
- b:*** *Salesperson's age.*

c: Salesperson's education level

d: Membership on NPD committees.

e: Understanding of how to communicate predevelopment -related information to NPD functions.

Sub-hypotheses 4d and 4e are accepted and sub-hypotheses 4a, 4b, and 4c are rejected based on the study's findings. The variables membership on a NPD team and understanding where to send NPD information were significantly associated with each involvement subscale. The membership and knowledge variables were also significantly associated with the dimension of salesforce-initiated involvement when the behavior of other study variables was taken into account.

The knowledge dimension education level attained, was negatively related to each involvement subscale. This relationship possibly stemmed from the sample characteristic of younger, less experienced employees to have attained a higher level of formal education than their more experienced peers. Age of a salesperson associated only with the INV-CE subscale, but this variable exhibited inconsistent patterns of association with individual study variables and the Phase Two model.

H7: *The greater the salesperson's perception of his value to NPD functions, the greater his involvement. Specifically, this perception is measured as:*

a: Feedback from NPD functions regarding a salesperson's information contribution.

b: Belief that a salesperson's contribution is acted on by NPD function.

Hypothesis 7 is accepted as statistical support was found for this hypothesized relationship. Both feedback and salesperson's belief were significantly related to each involvement subscale (INV-ABF and INV-CE). The combined sum of the feedback and belief measures also related directly to each involvement subscale.

CHAPTER VI

RESULTS DISCUSSION

This chapter interprets the study results and discusses contributions of the study to our general knowledge. First, key research findings are presented including implications for researchers and business managers. Next discussed are contributions provided by the study's research and findings. In conclusion, limitations of the study's design, sample, and analyses are addressed in conjunction with directions for future research.

Key Research Findings

In the first chapter of this study, three research questions were presented as the cornerstone of the study's proposed models and hypotheses. The intent of the exploratory design of this study was to collect and analyze data pertaining to these questions. Therefore, key study findings and their implications are presented within the framework of the each of the three following research questions.

Research Question #1:

How can salesforce involvement be measured for research purposes?

A measure was developed in Phase One of this study that gauges relative differences in a salesperson's involvement in predevelopment activities of NPD. Salesforce involvement can not be measured by a single variable, as several dimensions of involvement were extracted in the analyses. These dimensions were: cognitive interest in NPD, salespeople involvement activities initiated by NPD, and salespeople involvement activities initiated by the salesperson.

The involvement instrument consisted of a thirty-item survey, rated by the respondent through a behavioral ("never-always") Likert scale. Items were grouped into the three subscales, each corresponding to a salesforce involvement dimension. Subscales scores can be averaged as an organization-level mean, so either salesperson or salesforce NPD involvement can be described as a interval-type variable score.

The cognitive interest subscale measure of salesforce involvement exhibited inconsistent behavior in Phase Two of the study. This was likely attributable to the strained fit between a behavioral (always-never) type Likert scale and the more attitudinal (agree-disagree) nature of cognitive interest. The so-called physical aspects of

salesforce involvement appear stable in both survey phases, and displayed adequate levels of reliability when compared to an alternative measure of salesforce involvement in NPD.

Briefly, salesforce involvement, as supported by the research, can be operationalized as two subscale scores. In its current use, the context of the measure is limited to information communication with NPD or participation in NPD activities. The measure is sourced from salesperson responses to a Likert-scale survey and resulting scores are treated as interval variables representing either individual or salesforce group average.

Implications

For the researcher, a study of salesforce involvement requires either a multi-dimensional research design or further specification of salesforce involvement as solicited or unsolicited. Any exploration into the cognitive interest of a salesperson for NPD contribution should be pursued through attitudinal (agree-disagree) survey design to avoid the consistency problems experienced in this study. Despite the mentioned limitations, the involvement measure provides a tool for testing additional models exploring salesforce involvement as either antecedent or consequence of other variables

For the business person, the involvement measure provides a metric for measuring effectiveness of programs and policies aimed at increasing market understanding in NPD processes. If a firm or manager desires greater linkage between their salespeople and NPD, the survey items offer a range of ideas for involvement opportunities. The overall measure would provide a status quo baseline, allowing subsequent surveys to reflect the degree to which interim actions or events impact salesforce involvement.

Research Question #2

How do organizational attributes relate to the degree of salesforce involvement in NPD?

Within the sample limitations of industrial and high-tech firms, salesforce involvement varied between organizations. This was noteworthy as the sample was relatively homogeneous in a number of organization demographics. With few exceptions, the salesforce of respondent firms were college graduates, middle-aged, and experienced in sales. The majority used voice mail and electronic mail, perceived NPD processes existing and formal in nature, were highly oriented to their customer's needs, and spent relatively little time on NPD activities as compared to selling, preparing paperwork, and training. Firms were marked by their differences in percentage of salesforce on NPD teams,

level of feedback the salesforce receives from NPD, and average degree of belief the salesforce has that their information sent to NPD is used appropriately in the company.

Interestingly, the variance was greater among organizations in the NPD-initiated salesforce involvement measure as compared to the counterpart measure for salesforce-initiated involvement. This finding agrees with the relatively larger variance in organization traits focusing on NPD activities such as percentage of salesforce membership on NPD teams, or average level of feedback the salesforce receives from NPD. Unfortunately, the cognitive interest aspect of involvement displayed scale inconsistency that prevent testing of its relationship with organizational attributes.

Although the research did not address causality, results indicate several significant relationships between salesforce involvement as measured by the two subscales, and selected organizational traits. The study found that the shorter the time a firm takes to develop product improvements, the more likely the salesforce will be involved in NPD-initiated activities and communications. In addition, the shorter a firm takes to develop new products, the more likely the salesforce will initiate involvement in NPD processes and data collection. On a

consolidated basis, the shorter a firm's cycle time is for NPD, the more likely its salesforce will be involved in NPD predevelopment activities.

Although not originally in the proposed study model, salesforce proximity to a firm's NPD organization also significantly related to salesforce involvement in NPD. Given the pervasiveness of on-demand communication tools such as electronic mail and voice mail, there is still greater NPD involvement for a salesforce that is located close (less than 50 miles) as opposed to distant to the NPD function location. Interestingly, a salesforce's access to electronic mail did not significantly impact their involvement.

A salesforce's perception of interdepartmental dynamics, as indicated by degree of conflict and connectedness between departments, did not relate to their level of NPD involvement. Both components of interdepartmental dynamics showed relatively minimal variance between firms, suggesting a "fish nor fowl" relationship between a salesforce and staff departments. Likewise, the salesforce's view of NPD process formality does not impact their involvement. The insufficiency of significant relationship of these variables to involvement suggests the boundary location of the salesforce between

firm and market, somewhat desensitizes the salesforce to perceptions of conflict, cohesiveness and formality in staff functions.

Implications

Although there are many reasons for a firm to shorten NPD cycle time, study results propose the additional benefit of greater salesforce involvement in NPD. NPD's perception of the short-term orientation of a salesforce appears to reduce the incentive to seek salesforce involvement in firms' with longer NPD cycles. Pilot study interviews with research and engineering management strongly suggested that the opinions and insights of salespeople and their customers were most valued when product introduction would be near-term rather than years away. Management should be aware of bias, whether founded or not, to discount the salesforce's value in NPD predevelopment activities as the product launch horizon lengthens.

Salespeople appear to initiate less involvement in NPD if they perceive a long product improvement cycle. This could be attributable to several factors including the difficulty of the salesforce to be aware of future technologies being evaluated by NPD. Another possible explanation is that it is more difficult for a salesforce to assess the impact of their market information if there is a long time span between

information provided and the resultant product or product improvement. Since the perception of contribution value is a key motivator of a salesperson's involvement, then a long delay in feedback could possibly dampen salesforce-initiated involvement in NPD. If management desires their salesforce to initiate information contributions to their NPD efforts, then the length of time between field input and improvement implementation or new product should be minimized.

The location of a salesforce relative to a NPD site is not something that business management can realistically or effectively impact. Yet, management should be aware of the barriers to effective cross-functional communication that stem from physical distance between groups. In particular, the significant relationship between the physical proximity of the two groups and salesforce involvement, supports continued sensitivity of managers to minimize the hurdles attributable to distance.

Current trends in salesforce management are to provide a number of virtual communication tools such as electronic mail, voice mail, and videoconferencing in efforts to minimize travel expense and salesperson time away from his customer. This study suggests that such trends may negatively impact the degree to which a salesperson is

involved with a critical corporate process such as NPD. If a firm desires increased market-orientation early in their NPD process through the utilization of salesforce market knowledge, then efforts should be made to support and fund “face-to-face” encounters between NPD and the salesforce.

Salesforce perceptions of cultural attributes such as interdepartmental conflict, department cohesiveness, and formality of NPD processes did not impact the degree of salesforce involvement in NPD. For management, this implies that salesforce involvement can not be substantially influenced through programs that improve interdepartmental dynamics or increase formality of NPD processes. Instead, the degree of salesforce involvement relates to organizational traits of face-to-face NPD communication, and length of cycle time. These findings relate to the boundary-spanning nature of the salesforce as less affected by common processes and culture of the corporate system, than direct influences on their system of information exchange between customers and the firm.

Research Question #3

How do the personal characteristics of salesperson relate to degree of involvement in NPD predevelopment activities?

There is a definite relationship between an individual salesperson's NPD involvement and a number of personal attributes. The strongest relationship suggested in the study was between a salesperson's involvement NPD and his perception of his value to NPD functions. This association was represented by both aspects of salesforce-initiated and NPD-initiated involvement reacting strongly to the variable measure of salesperson's belief his NPD-oriented information would be appropriately used by the firm. The importance of the relationship between salesperson involvement and the belief that his/her involvement is used appropriately by the organization is not diminished when other study variables are taken into account. The relationship is substantial and unique in the context of this study.

A salesperson's knowledge of NPD also relates to his involvement, but only when knowledge is represented as a salesperson's NPD team membership or understanding of where to send NPD-oriented information in his firm. There were a number of findings regarding the role of education, salesperson's age and experience in the study. However, statistics did not support a consistent interpretation for the study results, possibly due to less than problematic range categories for collecting the data. Additional future may better explain the

relationship of age, experience and education with the degree of a salesperson's involvement.

Customer orientation of a salesperson also predicts salesforce involvement. The more focused a salesperson is on the needs of the customer over making the sale, the more involved the salesperson is in NPD, whether initiated by NPD or the salesperson. The study sample scores and variance for the customer orientation scale, SOCO, was also consistent with other research on SOCO behavior for industrial salespeople. Namely, that greater SOCO scale scores define a salesperson more inclined to promote his/her customer's interests and needs into the agenda of the corporation.

The final group of predictors, communication enablers, also related to salesperson involvement, but on a limited basis. The distance a salesperson is located from NPD predicts involvement at the individual level as it did for organizational level salesforces. The combined usage level of electronic mail and voice mail also related to salesforce initiated involvement in NPD. Voice mail access was available to everyone in the sample, with electronic mail nearly as pervasive extending to sixteen out of the nineteen companies surveyed.

Implications

For researchers, it is important to note that while significant relationships have been found in this study between selected salesperson attributes and involvement in NPD, causality was not explored. With the findings of this study, research should continue into evaluating causal relationships that are already suggested in literature. For example, the gatekeeper model of information communication based on perception of contribution value proposes both association and causality.

This study provides further support for the information gatekeeper theory of behavior for organizational boundary spanners. Clearly, the strong linkage between perception and involvement in this research should be considered as additional empirical support of the information gatekeeper model. Of additional interest is that the relationship between perception of value and involvement was significant both for salesforce-initiated and NPD-initiated activities. This suggests that the gatekeeper model may be appropriate for solicited information transfer in addition to unsolicited.

Researchers should also note the linkage between age, experience and education level of a salesperson and NPD involvement is not supported in literature, and should be further investigated to

determine a theoretical link or rule out coincidence. A combination of the three variables could likely create an ideal profile of a salesperson likely to respond to management-initiated efforts to increase salesforce involvement. This would be especially helpful for a firm that is looking for sales candidates to be members of a NPD team or a concept evaluation panel. Entire salesforces can not be used in such activities, but a more analytical selection process would benefit from greater investigation into the relationship between age, experience, education and salesperson NPD involvement.

The use of electronic and voice mail in the sample may be relevant attributes for other industry salesforce studies then in industrial / high-tech where such tools are the norm. Researchers should not rule out the possibility that the nature of these sample companies provides them more likely access to leading communication technologies. Although this study suggests greater leverage in increasing salesforce involvement from increased “face-to-face” communications, other industries with minimal “virtual communications” capabilities may find leverage in widespread adoption of electronic communication enablers.

Study findings are also relevant to business managers on a number of points. First, the strong relationship between a

salesperson's involvement and his perception of contribution value urges NPD teams to provide feedback to salespeople to maintain and improve the flow of market information from this group. Maintaining directories of NPD team names or directions on who to contact with information is also an important part of an infrastructure that encourages salespeople to be involved with NPD. Finally, efforts should be made to include salespeople on NPD teams, even if located remotely from NPD staff. Employment of communication tools such as electronic mail and voice mail in addition to "face-to-face" contact will make a difference in encouraging the linkage of salesforce and NPD.

Study Contributions

This study offers a number of potential contributions to practitioners interested in improving their firm's NPD success rate by tapping the market knowledge of the salesforce. While the salesforce is one of several avenues into market understanding, there has been minimal research that measured and explored the nature of salesforce involvement in NPD activities, particularly in the early or predevelopment stages of NPD. An understanding of NPD involvement behavior and possible correlates can facilitate effective endeavors to increase market knowledge in early NPD stages.

For future research efforts, this study offers a scale for measuring the degree of involvement an individual salesperson or salesforce has in the NPD predevelopment activities of ideation, concept screening and early market assessment. This measure can be used for testing a number of suggested theories presently existing in literature, but not explored in this study. In addition, the methodology used in developing the involvement measure can be adapted to create NPD involvement scales for key customers, marketing staff, product managers, and channel partners.

For sales and marketing management, this study contributes insight into the variability of salesforce involvement, and some additional understanding of salesperson and salesforce behavior on other variable measures. At the organizational level, this study proposes an additional benefit to shorter NPD cycles - namely, increased involvement by the salesforce. Study results provides additional evidence of the reinforcing loop of decreased cycle time - better, earlier market understanding.

The significant relationship of salesforce involvement and the physical distance between a salesperson or salesforce and the firm's NPD location furnishes additional incentive for companies to be sensitive to remote-located employees. Study findings support theories

on the boundary-spanning behavior of the salesforce and the importance of providing opportunities to bring sales and staff groups together.

Taken together, these findings on the behavior of salesforce involvement at the organization level support a view of a firm's salesforce as a system, independent of the headquarters-staff system of a company. This means that variations in processes of the HQ system may have less impact than realized on the behavior and attitudes of a salesforce. Consequently, for management to increase involvement of the salesforce-system in a HQ system process, a more direct effort will entail offering a variety of direct communication opportunities and electronic communication enablers between the two groups.

Even more critical for management to note is the tie between a salesperson's perception of the value of his/her involvement and the degree of involvement. Management efforts to increase involvement must include tracking the salesperson perception of whether the information was used appropriately by the firm. Elaborate or formal efforts by management to involve salespeople will have little impact if a salesperson perceives that the information is not used or made available to the heart of the NPD team.

There are several facets of the contributions of this research to the study of salesperson behavior, attitudes and their NPD involvement. The gatekeeper model of a salesperson's motivation to contribute is supported by this study. In particular, salespeople were motivated to greater involvement when there was strong belief that the information contributed would be appropriately reviewed, and when feedback was given on salespeople contributions to NPD processes.

Along with supporting the theories of the gatekeeper model, the study promotes overall importance of two-way information in any cross-functional effort. Information sent to the salespeople on who to contact on NPD, or inviting them to participate on NPD teams improves the reciprocity of information from the salespeople on customer needs and competitive activities. Overall, this study contributes an empirical foundation for research into collaborative process involvement between groups such as sales and NPD teams, that are not strongly linked in traditional organizations.

Study Limitations and Future Directions

As with most exploratory research, this study has significant, although not uncommon limitations. Present research limitations often provide a source for future study recommendations; certainly this is

the case for this effort. The following discussion of study limitations and future research directions are categorized into three main areas: design, sample and analyses.

Limitations of Design

The use of self-report questionnaires for data collection in scale development and hypothesis testing introduced several possible sources of bias in either sample. First, respondents may have answered questions in a pattern perceived as more socially or politically desirable than what they actually believed or experienced. Despite an anonymous design, respondents were aware of possible firm-to-sample comparison, and may have desired a specific outcome that would support some personal agenda. The voluntary nature of the survey introduces a similar bias as those salespeople not responding may likely be more alienated from staff activities such as NPD.

Another possible limitation is the use of a cross-sectional design rather than a longitudinal study. The nature of NPD as a process implies a sequencing of activities. Although the study's cross-sectional design allows the evaluation of relationships among the model's variables, it does not facilitate a dynamic study of the interrelationships between involvement in one specific activity and the

involvement in another activity downstream in the NPD process.

The cross-sectional design also precludes measuring involvement as observed in the NPD evolution rather than as a slice-in-time perception of a salesperson. With a longitudinal approach, a more elaborate causal model could be developed as a better representation of the relationships among the variables of interest.

By utilizing self-assessment measures, this study's interpretation of salesforce involvement is restricted to self-perception and no other viewpoint. The perception of salesforce involvement from the perspective of marketing or NPD personnel could provide an alternative reliability measure for the scale developed in this study. In addition, such a perspective opens up additional research into the value dimension of salesforce involvement in NPD. Clearly the comparison of sales and NPD perceived value of salesforce contributions to NPD would be a recommendation for future research. Such investigation would be of value to businesses that are introducing and evaluating market information sources into their NPD processes.

Other alternatives for measuring a salesperson's physical involvement include a objective researcher observing and measuring a salesperson's activities over time. However, such a design would have been impractical across a sample of 248 salespeople located across the

U.S. and several countries. In addition, the cognitive aspect of a salesperson involvement in NPD would not be captured - a deficiency already existing in the study's alternative measure of involvement, i.e. time spent in NPD activities.

A final area of design limitation was in the measure for the criterion variable, salesforce involvement in NPD predevelopment activities. The survey items were generated for a behavioral "never-always" scale, more appropriate for the physical, i.e. information transfer rather than cognitive aspect of involvement. A higher proportion of the generated items for the cognitive aspect of involvement were deleted during scale refinement because of awkward wording with the "never-always" scale. The inability of the cognitive-oriented subscale to maintain consistency with the Phase Two study sample may have stemmed from this initial design limitation.

A future research recommendation would be to measure the cognitive aspect of involvement with a second Likert scale that would be attitudinal or "agree-disagree" in meaning. In such a design, involvement would be separated into two variable measures of cognitive interest and physical, i.e. information transfer. Each of these variables, and viable subscales, would then have item wording and response scoring consistent with the underlying dimension of the variable.

Limitations of the Sample

Data collection for the study was limited to three firms during scale development and nineteen during model testing. An additional twelve firms declines to participate, thereby introducing the possibility of bias from the firms that were involved in the research. Most of the firms that participated in the study were either associated with Oregon or the researcher. A future recommendation would be to use a national organization such as the New Product Management Association to solicit a more geographic and industry representative sample.

Study samples were limited to American high-tech and industrial firms. Consequently, additional variables such as industry type, service vs. product sales, or relationships between NPD involvement and NPD country location were not tested. Larger samples may also have facilitated exploring the association between salesperson involvement and gender, previous work experience, or college major. All of these additional sample characteristics and data collection perspectives are valid research objectives, and should be pursued in future studies of salesforce involvement in NPD.

Limitations of Analyses

This study was exploratory in nature, focusing on the establishment of a criterion measure and an initial look into simple associations between the measure and other variables. As such, salesforce involvement was not studied as part of a model based on confirmatory factor analysis. Future research should explore which, if any, of the variables that relate to involvement are direct or indirect influences. Such analyses would be appropriate for future research into the dynamics of salesforce involvement, especially in understanding the linkage between individual and organization level effects.

Measure for the salesperson's age, sales experience and education were collected as ordinal categories. The relationships between these three variables and other study measures indicated that the categories used in data collection may not have been appropriate. Data should have been captured in a nominal format, and then analyzed for appropriate coding. Future studies that utilize this approach will be in a better position to assess the true relationship between the age, experience, and education of a salesperson and the degree of involvement.

Hierarchical regression was not used in this study to test overall model fit to the involvement variables. This limitation was set by the scope of the study, namely to investigate a series of associations between selected organizational or individual level attributes and sales involvement. Multiple regressions were used to assess unique relationships between predictor variables and involvement, but the technique was limited to simple variable enter and not more elaborate hierarchical approaches. A future research project would be to assimilate the variables from this study, and any others subsequently correlated, into a comprehensive model used to explain overall variance of salesforce involvement at organization and individual levels. The research design could also separate the cognitive and physical aspects of involvement into two models, or limit model fit to either organization salesforce involvement or individual participation.

This study laid the empirical foundation for more complex models and further analyses of the dynamics of salesforce involvement in NPD. Over time, research should move beyond involvement as a criterion variable into the study of salesforce involvement as a predictor of NPD success or market orientation of the NPD process. Studying the intricate linkage of salesforce information contribution and improved market understanding is the end vision of this exploratory endeavor. As

such, this research should be viewed as an initial effort into increasing our knowledge of the interconnections between salespeople and new product development.

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APPENDIX A

SUGGESTED ITEM POOL FOR INVOLVEMENT SCALE

(*INVOLVE*)

Appendix A
Suggested Item Pool for Involvement Scale
(INVOLVE Variable)

The following items would be tested using a Likert scale of 1 - 5 as follows:

	1 - Never	2 - Rarely	3 - Sometimes	4 - Often	5 - Always
Question	Never.....Always				
1. I participate in new product brainstorming sessions.	1	2	3	4	5
2. I am asked to forecast sales for products that are still in development.	1	2	3	4	5
3. I participate in meetings that evaluate new product ideas or features.	1	2	3	4	5
<u>4.</u> My customers and I do <u>not</u> discuss product concepts my firm is considering for development.	1	2	3	4	5
5. I am told about a new product idea before it is built.	1	2	3	4	5
6. I am invited to participate in new product disclosures that are given to my customers.	1	2	3	4	5
7. I am asked for my opinion on new product ideas.	1	2	3	4	5
<u>8.</u> I don't inform my company about needs my customer has unless there is a good chance we can provide a solution today.	1	2	3	4	5
9. I am asked for suggestions on improvements on our products.	1	2	3	4	5
<u>10.</u> When I hear a rumor about a new competitive product from my customers, I keep it to myself.	1	2	3	4	5
11. I call or meet with the people in new product development when I have an idea for a new product.	1	2	3	4	5
<u>12.</u> I place more emphasis on telling my company about sales I lost because of price, than sales I lost because we didn't have the right product.	1	2	3	4	5
<u>13.</u> If a customer suggests an improvement for a product, I tell him who to contact in our company.	1	2	3	4	5
<u>14.</u> I don't communicate directly with people in new product development	1	2	3	4	5
15. I am asked to participate in customer visits that engineers or development people make in my territory.	1	2	3	4	5

		179				
<u>Question</u>		<u>Never.....Always</u>				
<u>16.</u>	I have no knowledge of what product ideas are under evaluation in my firm.	1	2	3	4	5
17.	I contact people in new product development when I hear about competitive new products or product improvements.	1	2	3	4	5
18.	Before anyone in the company selects my customers for new product research, I am notified.	1	2	3	4	5
<u>19.</u>	People from my company discuss new product plans with my customers before informing me.	1	2	3	4	5
20.	I am involved in design of customer surveys on new product requirements.	1	2	3	4	5
<u>21.</u>	I am aware of future products only when they are ready to be field tested or announced to the customers.	1	2	3	4	5
22.	If I attend a trade show, I inform my company about any new competitive products I see or hear about.	1	2	3	4	5
23.	I am asked to recommend customers to be part of new product focus groups.	1	2	3	4	5
24.	I am able to initiate discussions on joint development projects between my customer and my company.	1	2	3	4	5
<u>25.</u>	I am not asked by new product development people to provide feedback on their ideas or designs before they have been approved as funded projects.	1	2	3	4	5
<u>26.</u>	I am excluded from the process that decides on new products.	1	2	3	4	5
27.	I participate in market research that evaluates needs for new product ideas.	1	2	3	4	5
<u>28.</u>	My territory reports do not include items related to new product or product feature ideas.	1	2	3	4	5
29.	My firm asks me what I think of new product ideas or designs before they are developed.	1	2	3	4	5
30.	Evaluating product prototypes are part of my job.	1	2	3	4	5
<u>31.</u>	I don't report to my company information on competitors' products still in development.	1	2	3	4	5
32.	I enjoy talking to engineers about new product ideas.	1	2	3	4	5
<u>33.</u>	My time is used inappropriately when I am involved in market research on new products my company plans to develop.	1	2	3	4	5

		180				
<u>Question</u>		<u>Never.....Always</u>				
34.	I would like to contribute in a group that develops new products.	1	2	3	4	5
<u>35.</u>	Leading edge customers are more difficult to sell to than the average customer.	1	2	3	4	5
<u>36.</u>	I don't participate in product updates unless it is something I can sell today.	1	2	3	4	5
37.	It's important for me to pass on to my firm any new product ideas.	1	2	3	4	5
38.	It is important to inform my company what the customer wants in future products.	1	2	3	4	5
39.	I can make an important contribution to my firm's new product development efforts.	1	2	3	4	5
40.	My input has little value to new product decisions at my firm.	1	2	3	4	5

note: underlined item numbers denote negatively worded items.

APPENDIX B

SUGGESTED ITEM POOL FOR SALESPERSON'S BELIEF
IN INFORMATION USAGE
(*BELIEF*)

Appendix B
Suggested Item Pool for Scale of Salesperson's Belief In Information Usage Scale
(BELIEF Variable)

The following items would be tested using a Likert scale of 1 - 5 as follows:

1 - Strongly Disagree 2 - Disagree 3 - Neutral 4 - Agree 5 - Strongly Agree

<u>Question</u>	<u>Strongly Disagree.....Agree</u>				
1. When I pass on new product ideas, they are given serious consideration for new product development.	1	2	3	4	5
2. New product development people care about my opinion of their new product designs.	1	2	3	4	5
3. I am confident that when I pass on information about new customer needs, it is evaluated by the people in new product development.	1	2	3	4	5
<u>4.</u> New product development people would rather talk directly to customers about their needs than ask me what my customers want.	1	2	3	4	5
5. My company wants to know my opinion about their new product prototypes and designs.	1	2	3	4	5
<u>6.</u> In this company, the salesforce is not respected as a source for new product ideas.	1	2	3	4	5
<u>7.</u> The only way I get my new product ideas to be evaluated is to get a customer to tell our product development or marketing people.	1	2	3	4	5
<u>8.</u> You need to be an engineer or in marketing to be valued in new product development meetings.	1	2	3	4	5
<u>9.</u> New product development people only ask for my opinion on their plans when they are told to by management.	1	2	3	4	5
10. I am involved in new product development at my firm because I am respected for my opinion.	1	2	3	4	5
11. I am viewed as an important source of market information about new products and features that should be developed by my firm.	1	2	3	4	5
<u>12.</u> In order to get my opinion on new products heard, I have to be aggressive.	1	2	3	4	5

<u>Question</u>	183				
	Strongly	Strongly			
	Disagree.....	Agree			
	1	2	3	4	5
13. New product development people want more participation from me in their meetings.	1	2	3	4	5
14. I am confident that the new product development group uses information they receive from me wisely.	1	2	3	4	5
15. My views are not considered in new product plans.	1	2	3	4	5
<u>16.</u> The new product development group only hears what they want to when I provide feedback on new products.	1	2	3	4	5
<u>17.</u> The new product development group's use of my feedback on new products is only superficial.	1	2	3	4	5
<u>18.</u> The new product development group is defensive when I give them negative feedback on new product ideas.	1	2	3	4	5

note: underlined item numbers denote negatively worded items.

APPENDIX C

INTERVIEW SUMMARIES: SALESFORCE ACTIVITIES THAT ARE ASSOCIATED WITH PREDEVELOPMENT INVOLVEMENT

Appendix C
Interview Summaries:
Salesforce Activities that are Associated With Predevelopment Involvement

Activity Categories ¹						
Subject Code	Meeting Participation	Customer Interface	Idea Communication	Idea Screening	Market Intelligence	Features Definition
Manager	1a, 1b	2c	3a, 3c	4b		6a
Manager	1a	2c	3a, 3c			6b
Manager	1a, 1c	2c	3a, 3b, 3c	4a, 4b	5a	6b
Manager	1a, 1b, 1c	2a	3a, 3b, 3c	4a, 4b	5a, 5b	6b
R&D	1a, 1b	2c	3a, 3b, 3c	4a, 4b	5a, 5b	6a, 6b
R&D	1a, 1b		3a, 3b, 3c		5a	6b
R&D	1a		3a, 3b, 3c	4b	5a	6a
R&D	1a		3a, 3b, 3c	4b		6a
R&D			3a, 3b	4a, 4b		6a
Sales	1a, 1b	2a, 2b	3a, 3b	4b	5a, 5b	6b
Sales	1a, 1c	2b	3a, 3b	4b	5a	6a, 6b
Sales	1a, 1b	2c	3a, 3b, 3c	4a, 4b		6a, 6b
Sales	1c	2b	3a, 3b	4b		6a
Sales	1b	2a, 2cb	3a, 3b, 3c	4a		6a
Sales	1b	2a, 2c	3a, 3b, 3c	4a	5a	6a, 6b

¹ For descriptions of each activity code, see next page.

Descriptions of Activity Codes

Meeting Participation	1a. Participation in brainstorm sessions.	1b.. Membership or participation in concept/prototype evaluation meetings.	1c. Representation on NPD committees
Customer Interface	2a. Ability to disclose customers on new product prototypes or ideas	2b. Involvement/Review of customer surveys, user groups	2c. Sponsor lead user partnerships, be included in all related activities
Idea Communication	3a. Routine submission of new product ideas and improvements over E-Mail	3b. Phone calls or Voicemail to R&D of new product ideas and improvements	3c. Field visits or conference calls by R&D for idea solicitation
Idea Screening	4a.. Disclosure on current product ideas via E-Mail or conference calls	4b. Sales input formally solicited on ideas and "breadboards"	
Market Intelligence	5a. Routinely communicate competitive NPD "rumors"	5b. Participation in formal surveys on competitor activities	
Features Definition	6a. Be solicited for input on feature needs	6b. Participate in formal "concept testing"(surveys, demonstrations)	

APPENDIX D

EXCERPTS OF INTERVIEWS:
RELATIONSHIP OF SALESPERSON INVOLVEMENT,
AND BELIEF THAT INVOLVEMENT IS VALUED BY FIRM

Appendix D**Excerpts of Pilot Study Interviews:****Relationship of Salesperson Involvement, and Belief That Involvement
is Valued by Firm****Salesperson A**

I have enough to do without looking for more things to keep me busy. If the company isn't going to use information I give it...then it is no skin off my back to quit letting them know what I hear in the territory.

Salesperson B

Every time I get assigned to some sort of a task force or committee on deciding what a customer wants, I cringe. The truth is the engineers already know what they are going to make, for all I know they have already developed the product. I feel like I am being manipulated when I say something so that its just used to confirm what marketing or whoever has already decided to do. I don't need my time wasted like that.

Salesperson C

I only talk to certain people about my ideas for products. I don't want to waste my time with someone who is just asking me questions so he can check off some box on his form. I'll spend my time with someone who really cares what I think, and will use the information. Around here you can tell who the people are that listen to the salesforce. They are the ones that have no problem getting us to return their calls or take them on customer visits.

Salesperson D

I do what I can to help the company design better products. After all, I am the one that has to sell them sooner or later. The truth is there are sometimes I don't think anyone even thinks about what I tell them, but most of the time those staff guys are glad I said something about what the customers really want to see. I want the company to succeed as much as the next guy, but I do get the feeling that some of these staff types think we are a bunch of dummies out here and really don't understand what the customer wants next year.

We call ourselves "mushrooms" sometimes. You know the old saying, salespeople are like mushrooms because corporate likes to keep them in the dark and feed them a lot of manure. Well, those people that treat us that way, we don't bother to talk to them, fill out their forms or attend their meetings.

Salesperson E

I don't remember the last time someone asked me for ideas or my opinion on some new products to be developed. On the other hand, I often get suggestions from my customers or find out about some great feature our competitors are developing, and feel I should pass on the information. In that case, I tell my manager or some of the folks in marketing that I know. I'm certainly not going to get involved in anything to do with new product development unless I know ahead of time that they aren't going to just trash the input. Some of the people around here have big egos and don't want someone suggesting they don't know everything that goes on in the field.

APPENDIX E

COVER LETTER AND QUESTIONNAIRE FOR THE
SURVEY OF JUDGES

Candace Petersen
Doctoral Student, Portland State University
Systems Science Ph.D. Program
P. O. Box 751
Portland, OR 97207 - 0751

January 8, 1994

NAME,

I'd like to ask for your assistance in my research study. As you know, I am doing my doctoral dissertation in the Systems Science Program at Portland State University. I am studying the involvement of salespeople in the early stages of new product development (NPD). The results of my study may be useful in understanding what influences salespeople to be involved in NPD activities, and how firms can make that involvement more productive. I want to test what organizational and individual factors predict the degree of involvement a salesperson has in initial NPD activities - activities such as generating new product ideas, determining market requirements, and defining product features from a customer perspective.

To do this, I am developing two sets of questions that will be included in my research questionnaires. The first set of questions is to measure the degree of involvement a salesperson has in early NPD activities. The other set will measure the degree of belief that a salesperson has that information he contributes to NPD will be evaluated and used appropriately in the firm. These concepts are discussed in research literature, but to my knowledge have never been measured. Because of your expertise in managing sales and marketing people, your opinion is important to me in choosing the best items in the two sets of questions to use in my survey questionnaire.

This will probably take about 30 minutes of your time. In thanks for your participation, I will send you a copy of the final questionnaire and my research results. The attached material contains a definition of the two concepts - involvement in NPD activities, and belief in appropriate usage of information - and instructions for rating the items. Also enclosed is a stamped, addressed envelope for return of the materials to me. Thank you for your generosity in considering this request. I appreciate your participation and support so please don't hesitate to contact me if you have questions or concerns on this request.

Sincerely,

Candace Petersen

(503) 650 - 8459 (Home)
(503) 685 - 8542 (Work)

PART A:
Item Rating for the Concept of Salesforce Involvement in Early NPD Activities

Definition

Salesforce involvement in early activities of new product development (NPD) contains three main ideas. The first is what is meant by early activities of NPD. The two remaining ideas pertain to the physical and mental aspects of involvement. Together, these views create a concept that represents the level of both physical and mental involvement a salesperson has in early NPD activities.

Early, or predevelopment activities of NPD refer to those tasks that occur before formal product development. These include idea generation and evaluation, understanding and defining customer requirements, defining the product concept in terms of features and functions, and "customer-orientated" evaluation of prototypes. Physical involvement in these activities ranges from participation in committees to submitting of product ideas over an electronic mail system. Physical involvement can be viewed as a salesperson contributing data into the early steps of new product development. Mental involvement refers to the cognitive awareness of these activities and the value placed on them.

The following set of forty items are designed to specifically address mental or physical involvement in the various possible activities of early NPD.

Instructions

Salespeople will be asked to assess their behavior on a five point scale for each of the items. The scale is:

1 - Never 2 - Rarely 3 - Sometimes 4 - Often 5 - Always

Some item numbers are underlined and in bold text. These items are "reversed" and are used to keep respondents from being lulled into marking a choice without really comprehending the question. When evaluating these "reversed" items, simply use the bold text instructions found within parenthesis in each code explanation below.

Please review each of the next forty items pertaining to salesforce involvement. Evaluate each item by circling either a "C", "S", or "N" to the right of each question, by using the following criteria:

If you feel that a response of 5 - ALWAYS (1 - NEVER) is CLEARLY indicative of a high degree of involvement in early activities of NPD, then circle the letter "C", for "Clearly", at the right of the item.

If you feel that a response of 5 - ALWAYS (1 - NEVER) is SOMEWHAT indicative of a high degree of involvement in the early activities of NPD, then circle the letter "S", for "Somewhat", at the right of the item.

If you feel that a response of 5 - ALWAYS (1 - NEVER) is NOT indicative of a high degree of involvement in the early activities of NPD, then circle the letter "N", for "Not", at the right of the item.

Comments and suggestions for other items are certainly welcome, and can be written in the margins or on the back of the page.

1. I participate in new product brainstorming sessions.	C	S	N
2. I am asked to forecast sales for products that are still in development.	C	S	N
3. I participate in meetings that evaluate new product ideas or features.	C	S	N
<u>4.</u> My customers and I do <u>not</u> discuss product concepts my firm is considering for development.	C	S	N
5. I am told about a new product idea before it is built.	C	S	N
6. I am invited to participate in new product disclosures that are given to my customers.	C	S	N
7. I am asked for my opinion on a new product idea.	C	S	N
<u>8.</u> I don't inform my company about needs my customer has unless there is a good chance we can provide a solution today.	C	S	N
9. I am asked for suggestions on improvements on our products.	C	S	N
<u>10.</u> When I hear a rumor about a new competitive product from my customers, I keep it to myself.	C	S	N
11. I call or meet with the people in new product development when I have an idea for a new product.	C	S	N
<u>12.</u> I place more emphasis on telling my company about sales I lost because of price, than sales I lost because we didn't have the right product.	C	S	N
<u>13.</u> If a customer suggests an improvement for a product, I tell him who to contact in our company.	C	S	N
<u>14.</u> I don't communicate directly with people in new product development	C	S	N
15. I am asked to participate in customer visits that engineers or development people make in my territory.	C	S	N
<u>16.</u> I have no knowledge of what product ideas are under evaluation in my firm.	C	S	N
17. I contact people in new product development when I hear about competitive new products or product improvements.	C	S	N
18. Before anyone in the company selects my customers for new product research, I am notified.	C	S	N
<u>19.</u> People from my company discuss new product plans with my customers before informing me.	C	S	N
20. I am involved in design of customer surveys on new product requirements.	C	S	N
<u>21.</u> I am aware of future products only when they are ready to be field tested or announced to the customers.	C	S	N

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22. If I attend a trade show, I inform my company about any new competitive products I see or hear about.	C	S	N
23. I am asked to recommend customers to be part of new product focus groups.	C	S	N
24. I am able to initiate discussions on joint development projects between my customer and my company.	C	S	N
<u>25.</u> I am not asked by new product development people to provide feedback on their ideas or designs before they have been approved as funded projects.	C	S	N
<u>26.</u> I am excluded from the process that decides on new products.	C	S	N
27. I participate in market research that evaluates needs for new product ideas.	C	S	N
<u>28.</u> My territory reports do not include items related to new product or product feature ideas.	C	S	N
29. My firm asks me what I think of new product ideas or designs before they are developed.	C	S	N
30. Evaluating product prototypes are part of my job.	C	S	N
<u>31.</u> I don't report to my company information on competitors' products still in development.	C	S	N
32. I enjoy talking to engineers about new product ideas.	C	S	N
<u>33.</u> My time is used inappropriately when I am involved in market research on new products my company plans to develop.	C	S	N
34. I would like to contribute in a group that develops new products.	C	S	N
<u>35.</u> Leading edge customers are more difficult to sell to than the average customer.	C	S	N
<u>36.</u> I don't participate in product updates unless it's something I can sell now.	C	S	N
37. It's important for me to pass on to my firm any new product ideas.	C	S	N
38. It is important to inform my company what the customer wants in future products.	C	S	N
39. I can make an important contribution to my firm's new product development efforts.	C	S	N
40. My input has little value to new product decisions at my firm.	C	S	N

PART B:

Item rating for the concept of salesforce belief that their information contributed would be appropriately evaluated and used in NPD.

Definition

Research has suggested that one reason people may not be involved in an activity is that they perceive their input or participation is not valued or used. A person may not attend a meeting, or fill out a survey if he feels his contribution will only be discounted or even ignored in the process. On the other hand, people are more apt to be involved in they believe their opinion or information is highly regarded in an activity or team.

These next items are designed to measure the level of belief a respondent has that his input and contribution will be valued in the company's NPD process.

Instructions

Salespeople will be asked to agree or disagree with each item, using a five point scale of:

1 - Strongly Disagree 2 - Disagree 3 - Neutral 4 - Agree 5 - Strongly Agree

Some item numbers are underlined and in bold text. These items are "reversed" and are used to keep respondents from being lulled into marking a choice without really comprehending the question. When evaluating these "reversed" items, simply use the bold text instructions found within parenthesis in each code explanation below.

Please review each of the next forty items pertaining to salesforce belief in the appropriate usage of their information in NPD. Evaluate each item by circling either a "C", "S", or "N" to the right of each question, by using the following criteria:

If you feel that agreement with the item (**disagreement**) is CLEARLY indicative of a high degree of a salesperson's belief that their information is appropriately used in NPD, then circle the letter "C", for "Clearly", at the right of the item.

If you feel that agreement with the item (**disagreement**) is SOMEWHAT indicative of a high degree of a salesperson's belief that their information is appropriately used in NPD, then circle the letter "S", for "Somewhat", at the right of the item.

If you feel that a response of 5 - ALWAYS (1 - NEVER) is NOT indicative of a high degree of a salesperson's belief that their information is appropriately used in NPD, then circle the letter "N", for "Not", at the right of the item.

Comments and suggestions for other items are certainly welcome, and can be written in the margins or on the back of the page.

1. When I pass on new product ideas, they are given serious consideration for new product development.	C	S	N
2. New product development people care about my opinion of their new product designs.	C	S	N
3. I am confident that when I pass on information about new customer needs, it is evaluated by the people in new product development.	C	S	N
<u>4.</u> New product development people would rather talk directly to customers about their needs than ask me what my customers want.	C	S	N
5. My company wants to know my opinion about their new product prototypes and designs.	C	S	N
<u>6.</u> In this firm, the salesforce is not respected as a source for new product ideas.	C	S	N
<u>7.</u> The only way I get my new product ideas to be evaluated is to get a customer to tell our product development or marketing people.	C	S	N
<u>8.</u> You need to be an engineer or in marketing to be valued in new product development meetings.	C	S	N
<u>9.</u> New product development people only ask for my opinion on their plans when they are told to by management.	C	S	N
10. I am involved in new product development at my firm because I am respected for my opinion.	C	S	N
11. I am viewed as an important source of market information about new products and features that should be developed by my firm.	C	S	N
<u>12.</u> In order to get my opinion on new products heard, I have to be aggressive.	C	S	N
13. New product development people want more participation from me in their meetings.	C	S	N
14. I am confident that the new product development group uses information they receive from me wisely.	C	S	N
15. My views are not considered in new product plans.	C	S	N
<u>16.</u> The new product development group only hears what they want to when I provide feedback on new products.	C	S	N
<u>17.</u> The new product development group's use of my feedback on new products is only superficial.	C	S	N
<u>18.</u> The new product development group is defensive when I give them negative feedback on new product ideas.	C	S	N

APPENDIX F

RESULTS OF EXPERT JUDGES' RATINGS OF INDIVIDUAL ITEMS

APPENDIX F
SURVEY RATINGS OF "INVOLVE" SCALE ITEMS

ITEM	Sales Manager's Rating	Professor's Rating	Overall Rating	Salesperson Evaluation Comments
1	2.2	2.6	2.4	
2	2.2	2.2	2.2	
3	2.6	2.8	2.8	
4	2.0	2.8	2.4	
5	1.8	1.8	1.8	confusing
6	1.6	1.8	1.7	not applicable to all firms
7	2.6	2.6	2.6	
8	1.3	2.3	1.8	confusing, not clear
9	2.6	2.8	2.7	
10	2	2.4	2.2	
11	2.4	3	2.7	
12	1.6	2	1.8	not related to involvement
13	1.2	1.6	1.4	not relevant to concept
14	2.6	2.6	2.6	
15	2.2	2.4	2.3	
16	2.2	2.6	2.4	
17	2.4	2.4	2.4	
18	1.2	2.0	1.6	for some firms, impractical
19	2.2	2.4	2.3	
20	2.4	3	2.7	
21	2.2	2.2	2.2	
22	2	2.6	2.3	
23	2.2	2.4	2.3	
24	2.6	2.4	2.5	
25	3.2	2.8	3	
26	2.8	3	2.9	
27	2.6	2.8	2.7	
28	2.2	2.2	2.2	
29	2.6	3	2.8	
30	2.4	2.2	2.3	
31	1.8	1.8	1.8	confusing, not clear wording
32	1.6	1.8	1.7	not related to involvement
33	2.4	2.4	2.4	
34	2.4	2.2	2.3	
35	2	1.8	1.8	unrelated to NPD involvement
36	1.8	1.6	1.7	product updates may not exist
37	2.2	2.6	2.4	
38	2.6	2.6	2.6	
39	2.8	2.6	2.7	
40	2	2.4	2.2	

SURVEY RATINGS OF "BELIEF" SCALE ITEMS

ITEM	Sales Manager's Rating	Professor's Rating	Overall Rating	Salesperson Evaluation Comments
1	2.6	3.0	2.8	
2	2.4	3.0	2.7	
3	2.6	3.0	2.8	
4	1.8	2.4	2.1	maybe NPD would rather not talk to customers or sales
5	3.0	2.4	2.7	
6	2.8	2.8	2.8	
7	2.0	2.0	2.0	too emotional, negative impression of question as 'bad'
8	1.8	2.4	2.1	not related to information being evaluated
9	2.6	2.8	2.7	
10	2	2.0	2.0	
11	2.8	2.6	2.7	
12	2.2	2	2.1	not related to involvement
13	1.8	2.4	2.1	not relevant to concept
14	2.6	2.6	2.6	
15	3.0	2.4	2.7	
16	2.2	1.8	2.0	should be dropped as wording suggests "negativism" in attitude
17	2.8	2.6	2.7	
18	2	2.2	2.1	for some firms, impractical

APPENDIX G

**SALESPERSON SURVEY PACKET FOR
FINAL SCALE DEVELOPMENT**

January 18, 1995

Dear **PARTICIPANT:**

This questionnaire is part of a research project being undertaken by me for a doctoral thesis at Portland State University. The purpose of the project is to increase understanding of processes for new product development.

This study is being conducted with the consent of **FIRM NAME** in cooperation with human resources and top management. However, all information provided in this questionnaire is **STRICTLY CONFIDENTIAL**. Individual responses will **NEVER** be made available to any member of your company. Only the student researcher will examine your responses to the enclosed questions.

You will note that your questionnaire contains a code number on the first page. The number is necessary for the student researcher to analyze the data completely. Please be assured, however, that protection of your confidentiality is the first priority in this study. Although the student researcher will process your responses and corresponding code number, there is no means to match the numbers to employee names. In addition, the study data will be presented to your company only in terms of company averages. There will be no means to identify individual employees from the report provided at the conclusion of the study.

Your participation in this study is **VOLUNTARY**. Please respond to the questionnaire with as much frankness and accuracy as possible. There are no right or wrong answers as the research is interested only in your experience and perspective. If you have any questions regarding the enclosed questions, or the study in general, please use the contact information listed at the bottom of this letter.

YOUR TIME AND PARTICIPATION IS GREATLY APPRECIATED!

Sincerely,

Candace Petersen - Ph. D. Candidate
Systems Science Doctorate Program
Portland State University

If you have concerns or questions about this study, please contact the Chair of the Human Subjects Research Review Committee, Office of Research and Sponsored Projects, 105 Neuberger Hall, Portland State University, (503) 725-3417.

SURVEY

Involvement in New Product Development

The following is a series of questions about your *impression of how you are involved* in various activities in your company's new product development process. Please answer each question in terms of the feeling you most often had about your involvement during the past year. Use this scale to indicate your response by circling the corresponding number to the right of each question:

1 - Never

2 - Rarely

3 - Sometimes

4 - Often

5 - Always

<u>Question</u>	<u>Never.....Always</u>				
1. I participate in new product brainstorming sessions.	1	2	3	4	5
2. I am asked to forecast sales for products that are still in development.	1	2	3	4	5
3. I participate in meetings that evaluate new product ideas or features.	1	2	3	4	5
4. My customers and I do <u>not</u> discuss product concepts my firm is considering for development.	1	2	3	4	5
5. I am asked for my opinion on new product ideas.	1	2	3	4	5
6. I am asked for suggestions on improvements on our products.	1	2	3	4	5
7. When I hear a rumor about a new competitive product from my customers, I keep it to myself.	1	2	3	4	5
8. I call or meet with the people in new product development when I have an idea for a new product.	1	2	3	4	5
9. I don't communicate directly with people in new product development	1	2	3	4	5
10. I am asked to participate in customer visits that engineers or development people make in my territory.	1	2	3	4	5
11. I have no knowledge of what product ideas are under evaluation in my firm.	1	2	3	4	5
12. I contact people in new product development when I hear about competitive new products or product improvements.	1	2	3	4	5
13. People from my company discuss new product plans with my customers before informing me.	1	2	3	4	5
14. I am involved in design of customer surveys on new product requirements.	1	2	3	4	5

<u>Question</u>	<u>Never.....Always</u>				
15. I am aware of future products only when they are ready to be field tested or announced to the customers.	1	2	3	4	5
16. If I attend a trade show, I inform my company about any new competitive products I see or hear about.	1	2	3	4	5
17. I am asked to recommend customers to be part of new product focus groups.	1	2	3	4	5
18. I am able to initiate discussions on joint development projects between my customer and my company.	1	2	3	4	5
19. I am not asked by new product development people to provide feedback on their ideas or designs before they have been approved as funded projects.	1	2	3	4	5
20. I am excluded from the process that decides on new products.	1	2	3	4	5
21. I participate in market research that evaluates needs for new product ideas.	1	2	3	4	5
22. My territory reports do not include items related to new product or product feature ideas.	1	2	3	4	5
23. My firm asks me what I think of new product ideas or designs before they are developed.	1	2	3	4	5
24. Evaluating product prototypes are part of my job.	1	2	3	4	5
25. My time is used inappropriately when I am involved in market research on new products my company plans to develop.	1	2	3	4	5
26. I would like to contribute in a group that develops new products.	1	2	3	4	5
27. It's important for me to pass on to my firm any new product ideas.	1	2	3	4	5
28. It is important to inform my company what the customer wants in future products.	1	2	3	4	5
29. I can make an important contribution to my firm's new product development efforts.	1	2	3	4	5
30. My input has little value to new product decisions at my firm.	1	2	3	4	5

Belief That Your Information Is Used In New Product Development:

The following is a series of questions about your *degree of belief* that information you provide to your company is used in its new product development process. Please answer each question in terms of the belief you most often had this past year concerning your company's use of your information in its new product development efforts. Use this scale to indicate your response by circling the appropriate number to the right of each question:

1 - Strongly Disagree 2 - Disagree 3 - Neutral 4 - Agree 5 - Strongly Agree

	<u>Question</u>	<u>Strongly Disagree.....Agree</u>				
		1	2	3	4	5
1.	When I pass on new product ideas, they are given serious consideration for new product development.	1	2	3	4	5
2.	New product development people care about my opinion of their new product designs.	1	2	3	4	5
3.	I am confident that when I pass on information about new customer needs, it is evaluated by the people in new product development.	1	2	3	4	5
4.	My company wants to know my opinion about their new product prototypes and designs.	1	2	3	4	5
5.	In this company, the salesforce is not respected as a source for new product ideas.	1	2	3	4	5
6.	New product development people only ask for my opinion on their plans when they are told to by management.	1	2	3	4	5
7.	I am viewed as an important source of market information about new products and features that should be developed by my firm.	1	2	3	4	5
8.	I am confident that the new product development group uses information they receive from me wisely.	1	2	3	4	5
9.	My views are not considered in new product plans.	1	2	3	4	5
10.	The new product development group's use of my feedback on new products is only superficial.	1	2	3	4	5

***You have completed the survey! Please place in the self-addressed, stamped envelope that was enclosed in your survey packet, and return it to
Candace Petersen via U. S. Mail.
Your participation is greatly appreciated!***

APPENDIX H

TEN ITEM INTERCORRELATIONS:

BELIEF SCALE

APPENDIX H

Ten Items in BELIEF Pool and Their Zero-Order Correlations.

1	When I pass on new product ideas, they are given serious consideration for new product development.
2	New product development people care about my opinion of their new product designs.
3	I am confident that when I pass on information about new customer needs, it is evaluated by the people in new product development.
4	My company wants to know my opinion about their new product prototypes and designs.
5	<i>In this company, the salesforce is not respected as a source for new product ideas.</i>
6	<i>New product development people only ask for my opinion on their plans when they are told to by management.</i>
7	I am viewed as an important source of market information about new products and features that should be developed by my firm.
8	I am confident that the new product development group uses information they receive from me wisely.
9	<i>My views are not considered in new product plans.</i>
10	<i>The new product development group's use of my feedback on new products is only superficial.</i>

Reverse-worded items are italicized.

Item #	1	2	3	4	5	6	7	8	9	10
1	1.00									
2	.68	1.00								
3	.63	.65	1.00							
4	.36	.51	.47	1.00						
5	.52	.53	.63	.56	1.00					
6	.33	.42	.52	.53	.64	1.00				
7	.38	.50	.38	.64	.59	.52	1.00			
8	.55	.64	.62	.50	.69	.66	.54	1.00		
9	.45	.53	.43	.56	.59	.46	.70	.67	1.00	
10	.60	.55	.56	.44	.66	.58	.50	.69	.63	1.00

n = 136

All correlations are significant at the .05 level

Ten item scale α = .9224

Items 5, 6, 9, 10 are corrected for reversed item wording.

APPENDIX I

THIRTY ITEM INTERCORRELATIONS:
INVOLVE SCALE

APPENDIX I

Zero - Order Correlations for Thirty Item INVOLVE Scale

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1.00														
2	.48	1.00													
3	.57	.44	1.00												
4	.02	.05	0	1.00											
5	.54	.41	.54	.14	1.00										
6	.40	.41	.28	.16	.54	1.00									
7	.23	.18	-.13	.24	.18	.25	1.00								
8	.42	.17	.15	.22	.35	.25	.25	1.00							
9	.37	.23	.29	.14	.47	.44	.16	.39	1.00						
10	.34	.14	.30	0	.37	.21	-.05	.50	.29	1.00					
11	.24	.40	.28	.14	.40	.39	.11	.16	.49	.12	1.00				
12	.43	.18	.16	.21	.29	.10	.27	.66	.34	.38	.17	1.00			
13	.09	.10	0	.02	.18	.13	.21	.22	.03	.14	.17	.08	1.00		
14	.41	.24	.20	.16	.45	.40	.17	.46	.38	.34	.27	.30	.06	1.00	
15	.31	.36	.48	.04	.31	.20	-.12	.14	.33	.20	.25	.22	.23	-.08	1.0
16	.19	.11	-.02	0	.16	.03	.23	.35	.20	.05	.09	.48	.17	.19	.14
17	.28	.27	.19	.05	.38	.38	.08	.27	.33	.21	.17	.26	.12	.41	.13
18	.34	.29	.36	-.06	.52	.34	.04	.30	.22	.36	.22	.24	.18	.38	.30
19	.13	.12	.15	.35	.27	.06	.13	.25	.27	.14	.26	.10	-.04	.16	.10
20	.37	.14	.31	.05	.45	.19	.11	.37	.49	.28	.25	.23	-.01	.27	.09
21	.37	.26	.17	.14	.40	.34	.11	.37	.39	.27	.22	.33	.09	.52	.01
22	.22	.04	.01	.10	.14	.07	.15	.47	.36	.22	.25	.42	-.02	.18	.03
23	.41	.23	.29	.04	.32	.36	-.01	.35	.26	.27	.12	.23	.02	.38	.26
24	.46	.33	.42	.04	.44	.22	.11	.33	.34	.29	.16	.35	.02	.35	.25
25	.01	.01	.07	-.10	.15	-.12	.11	.16	-.03	.11	0	.21	.12	.03	.02
26	.07	.10	-.08	-.05	.03	.09	.21	.18	.16	.15	-.07	.07	.02	.07	.04
27	-.01	-.10	-.22	.13	-.05	-.15	.33	.31	.02	.06	-.09	.35	.05	.22	.19
28	-.21	-.12	-.11	-.01	-.16	-.10	-.09	-.16	-.16	-.14	-.04	-.03	-.11	-.04	-.18
29	.28	.29	.17	.12	.16	.16	.08	.32	.29	.11	.09	.26	-.07	.22	.16
30	.32	.28	.29	0	.37	.15	.07	.38	.43	.23	.30	.31	.11	.18	.24

Reverse-worded items noted by italics (#4, 7, 9, 11, 13, 15, 19, 20, 22, 25, 30)

Zero - Order Correlations for Thirty Item INVOLVE Scale
(continued)

Item	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
16	1.00														
17	.13	1.00													
18	.11	.48	1.00												
19	-.10	.21	.16	1.00											
20	.05	.32	.37	.54	1.00										
21	.14	.28	.27	.13	.40	1.00									
22	.23	.21	-.01	.35	.37	.20	1.00								
23	.21	.27	.25	.07	.24	.47	.12	1.00							
24	.22	.31	.25	.10	.31	.25	.11	.30	1.00						
25	.04	-.01	.08	0	.08	0	.02	.10	.18	1.00					
26	.03	.23	.11	.10	.19	.06	.19	.02	.31	.15	1.00				
27	.34	.14	.03	.13	.16	.16	.36	.05	.04	.05	.31	1.00			
28	.08	.01	.14	.04	-.16	.26	.03	.38	.18	.23	.13	.35	1.00		
29	.07	.33	.15	.07	.21	.16	.28	.21	.25	.07	.48	.28	.07	1.00	
30	.16	.39	.31	.29	.41	.11	.30	.16	.26	.15	.30	.20	.06	.41	1.00

Reverse-worded items noted by italics (#4, 7, 9, 11, 13, 15, 19, 20, 22, 25, 30)

APPENDIX J

ALTERNATIVE MEASURE OF SALESFORCE INVOLVEMENT

APPENDIX J

Alternative Measure of Salesforce Involvement

Question Instructions:

1. Review the list of five activities labeled "A" through "E" below.
2. You have a total of 100 points to divide among the five activities.
3. Assign points to each activity based on how much time you spend on the activity relative to the other four activities.
4. Assigning the same score to two activities means you spend about the same amount of time on each. If a score is twice as big for one activity group as another, then that means you spend twice as much time on the first activity group as compared to the second group.
5. A score of 0, indicates you do not spend any of your time on that activity.
6. All the activity scores should add up to 100.

ACTIVITY GROUPS

(A). Selling existing products to customers.	_____
(B). New product development activities.	_____
(C). Resolving customer satisfaction issues.	_____
(D). Territory reporting and forecasting.	_____
(E). Training and education.	_____

TOTAL	<u>100 pts</u>
--------------	-----------------------

APPENDIX K

SPONSORSHIP SOLICITATION PACKET

Candace Petersen
6353 Haverhill Ct.
West Linn, OR 97068
(H) 650 - 8459 or (W) 685 - 8542

J. Gerard Vieira
Director of World-wide Marketing
Planar Systems, Inc.
1400 N. W. Compton Dr.
Beaverton, OR 97006

August 29, 1995

Dear Mr. Vieira,

Thank you for taking the time today to return my phone call and discuss my research project. I appreciate your interest in supporting my completion of Portland State University's Ph.D. program. As background to the project, I have enclosed an executive summary of my dissertation proposal. A more detailed document is also available at your request.

You will note, that the core of the research is survey data from salespeople representing high technology firms. I have enclosed a copy of the survey packet for your review. Please note that the 60 questions require approximately 20 minutes of the respondent's time to complete (based on survey pre-test trials). In addition, individual participation is both anonymous and voluntary.

Your support for Planar's participation is very important to my research project. My study requires participation of at least 20 companies, each with a minimum of 15 salespeople. As a former sales manager, I understand how important a resource time is to a salesperson. Although I cannot offer any direct benefit to individuals for participating, I can provide to Planar a comparison of their consolidated results to those of other firms in the survey. Of course, no individual firm will be identified other than to itself in such summary reports.

Your interest and support are greatly appreciated. I will contact you in the next week to discuss possible study sponsorship. Please don't hesitate to contact me at work (685 - 8542) or home (650 - 8459) if you have any immediate questions or concerns. Thanks again on behalf of both my dissertation committee at PSU and myself...I look forward to your response!

Sincerely,

Candace Petersen

RESEARCH STUDY - EXECUTIVE OVERVIEW

Researcher - Institution:

Candace Petersen, doctoral candidate for Ph.D. in Systems Science - Business Administration

Dissertation Title:

"Salesforce Involvement in Early Stages of New Product Development Activities in High-Tech and Industrial Firms"

Study Background:

My interest in the salesforce as an important source of market information for new product development stems from over twenty years in field sales and marketing management. In my positions at various high-tech and industrial firms, I noted a wide variance in how field salespeople were involved in new product development (NPD). In particular, I found great difference in involvement in so-called early stage activities of NPD: idea generation, concept/feature definition, and initial market assessment.

Although academic literature has long noted the potential value of salespeople as a source of market information, research has been minimal. There has been significant research in NPD that points to adequate market knowledge early in the NPD process as the most critical determinant of product success. Furthermore, a majority of industrial firms indicate that the area of greatest deficiency for them in NPD is early market understanding. Clearly, research is long overdue on studying the role of the salesforce as one source of market information in early stages of NPD.

Key Premises of the Study:

The study is based on two widely accepted assumptions:

- (1) The most critical determinant of new product success is *adequate* market knowledge *early* in the NPD process.
- (2) Salespeople are a *unique* source of market knowledge because they:
 - *continuously interact* with customers,
 - are *directly rewarded* for recognizing and meeting customer needs.

However, the study does not advocate the salesforce as the one best or a complete source of market knowledge.

Research Purpose:

The study, based on data collected in the salesforce survey, is designed for two purposes:

- (1) To measure the relative level of involvement a salesperson or salesforce has in early stages of new product development (NPD).
- (2) To test for relationships between level of involvement and other variables such as:
 - formality of NPD process,
 - a salesperson's customer versus sales orientation,
 - interdepartmental conflict and communication,
 - accessibility and use of E-Mail and Voicemail systems,
 - length of NPD cycle time,
 - salesperson's experience and tenure.

In short, this research is largely exploratory in nature, focusing on basic definition and understanding of salesforce involvement in early stages of NPD.

Value of Proposed Study:

In addition to contributing new knowledge to academic research on NPD and marketing, the study is designed to also provide applied value to businesses. Intended benefits include: helping business leverage the salesforce as source of market information, identifying individual salespeople profiles with the greatest potential value to NPD processes, and identifying those organizational tools that facilitate salesforce involvement in NPD.

Participating firms also receive the benefit of summary reports outlining how their salesforce survey results compared to the consolidated results of all firms in the study.

Data Collection - Research Participants:

The research collects data using a survey with the following design characteristics:

- voluntary,
- self-administered (conducted via mail),
- less than twenty minutes for respondents to complete,
- respondent anonymity,
- direct mailing to respondent includes researcher addressed, stamped envelopes for returning the completed survey.

Research design also requires the following participant sample size:

- Minimum of twenty companies classified as either high-tech or industrial firms,
- Minimum of fifteen salespeople per firm must receive surveys. Salespeople are defined as having either territories or customers for which they are assigned quotas for product sales.

Requirements for Participation - Sponsorship:

- (1) Provide researcher, Candace Petersen, with business mailing addresses of a minimum of fifteen salespeople.
- (2) Provide permission for cover letter of survey packet to indicate approval of company for researcher to approach salespeople for voluntary participation.
- (3) Provide researcher with contact in New Product Development, and a contact in HR if appropriate to company policies.

Research Timeframe:

Survey packets should be mailed to salespeople by October 15 of this year. Data analysis and dissertation defense targeted to be complete by April, 1996.

Deliverables at Research Conclusion:

- Copy of completed dissertation
- Comparison of firm to consolidated data results
- Acknowledgment letter of participation (copy to PSU dean)

APPENDIX L

PHASE TWO SALESFORCE SURVEY

Questionnaire for
XXX's
SALESFORCE

Please Mail the Completed Survey By:

October 1, 1995

THANKS FOR YOUR SUPPORT!!!

Number of Questions: *60*
Estimated time to compete: *20 minutes*

August 20, 1995

Dear **PARTICIPANT:**

This questionnaire is part of a research project being undertaken by me for a doctoral thesis at Portland State University. The purpose of the project is to increase understanding of processes for new product development.

This study is being conducted with the consent of **FIRM NAME** in cooperation with human resources and top management. However, all information provided in this questionnaire is **STRICTLY CONFIDENTIAL**. Individual responses will **NEVER** be made available to any member of your company. Only the student researcher will examine your responses to the enclosed questions.

You will note that your questionnaire contains a code number on the first page. The number is necessary for the student researcher to analyze the data completely. Please be assured, however, that protection of your confidentiality is the first priority in this study. Although the student researcher will process your responses and corresponding code number, there is no means to match the numbers to employee names. In addition, the study data will be presented to your company only in terms of company averages. There will be no means to identify individual employees from the report provided at the conclusion of the study.

Your participation in this study is **VOLUNTARY**. Please respond to the questionnaire with as much frankness and accuracy as possible. There are no right or wrong answers as the research is interested only in your experience and perspective. If you have any questions regarding the enclosed questions, or the study in general, please use the contact information listed at the bottom of this letter.

YOUR TIME AND PARTICIPATION IS GREATLY APPRECIATED!

Sincerely,

Candace Petersen - Ph. D. Candidate
Systems Science Doctorate Program
Portland State University

If you have concerns or questions about this study, please contact the Chair of the Human Subjects Research Review Committee, Office of Research and Sponsored Projects, 105 Neuberger Hall, Portland State University, (503) 725-3417.

Involvement in New Product Development

The following is a series of questions about your *impression of how you are involved* in various activities in your company's new product development process. Please answer each question in terms of the feeling you most often had about your involvement during the past year. Use this scale to indicate your response by circling the corresponding number to the right of each question:

1 - Never 2 - Rarely 3 - Sometimes 4 - Often 5 - Always

#	Question	Never.....Always				
A1	It's important for me to pass on to my firm any new product ideas.	1	2	3	4	5
A2	If I attend a trade show, I inform my company about any new competitive products I see or hear about.	1	2	3	4	5
A3	I am involved in design of customer surveys on new product requirements.	1	2	3	4	5
A4	I participate in new product brainstorming sessions.	1	2	3	4	5
A5	I have no knowledge of what product ideas are under evaluation in my firm.	1	2	3	4	5
A6	I am asked to forecast sales for products that are still in development.	1	2	3	4	5
A7	I would like to contribute in a group that develops new products.	1	2	3	4	5
A8	I participate in meetings that evaluate new product ideas or features.	1	2	3	4	5
A9	I don't communicate directly with people in new product development	1	2	3	4	5
A10	I am asked for my opinion on new product ideas.	1	2	3	4	5
A11	Evaluating product prototypes are part of my job.	1	2	3	4	5
A12	When I hear a rumor about a new competitive product from my customers, I keep it to myself.	1	2	3	4	5
A13	I call or meet with the people in new product development when I have an idea for a new product.	1	2	3	4	5
A14	I contact people in new product development when I hear about competitive new products or product improvements.	1	2	3	4	5
A15	My input has little value to new product decisions at my firm.	1	2	3	4	5
A16	I am asked for suggestions on improvements on our products.	1	2	3	4	5

#	Question	Never.....Always				
A17	I participate in market research that evaluates needs for new product ideas.	1	2	3	4	5
A18	My firm asks me what I think of new product ideas or designs before they are developed.	1	2	3	4	5
A19	I can make an important contribution to my firm's new product development efforts.	1	2	3	4	5

Please indicate the extent to which you agree with each of the following statements.
Base your response on your experiences at your company over the past year.

1- Strongly Agree 2 - Disagree 3 - Neutral 4 - Agree 5 - Strongly Agree

#	Question	Disagree.....Agree				
B1	The product development group's use of my feedback on new products is only superficial.	1	2	3	4	5
B2	I am confident that the new product development group uses information they receive from me wisely.	1	2	3	4	5
B3	In this company, the salesforce is not respected as a source for new product ideas.	1	2	3	4	5
B4	I am viewed as an important source of market information about new products and features that should be developed by my firm.	1	2	3	4	5
B5	My views are not considered in new product plans.	1	2	3	4	5
C1	When members of several departments get together to discuss new product development, tensions run high.	1	2	3	4	5
C2	Most departments in our firm get along well with each other when it comes to new product development decisions.	1	2	3	4	5
C3	People generally dislike interacting with those from other departments.	1	2	3	4	5
C4	People from different departments feel that the goals of their respective departments for new product development are in harmony with each other.	1	2	3	4	5
C5	Protecting one's departmental turf is considered to be a way of life in this company.	1	2	3	4	5
C6	The objectives pursued by sales are incompatible with those of the engineering department when it comes to new product development.	1	2	3	4	5
C7	There is little or no conflict between departments in this company.	1	2	3	4	5
D1	In this company, it is easy to talk to anyone you need to, regardless of rank or department.	1	2	3	4	5
D2	There is plenty of opportunity for informal communication among individuals from different departments.	1	2	3	4	5

#	Question	Disagree.....Agree				
D3	Managers here discourage employees from discussing work-related matters with those who are not in their departments.	1	2	3	4	5
D4	In this company, employees from different departments feel comfortable calling each other when the need arises.	1	2	3	4	5
D5	People around here are quite accessible to those in other departments.	1	2	3	4	5
D6	Communications between departments are expected to be go through proper channels.	1	2	3	4	5
D7	People in my department can easily talk to people in other departments without getting managers involved.	1	2	3	4	5

Please answer the following questions about your company from *your* perspective.

1 - Never 2 - Rarely 3 - Sometimes 4 - Often 5 - Always 9 - Don't Know

#	Question	Never.....	Always	Don't Know
E1	I receive feedback from the new product development group on any comments or suggestions I provide the firm regarding new product ideas.	1	2 3 4 5	9
E2	I know where in the organization I should send any new ideas I have for products or product features.	1	2 3 4 5	9
F1	I use an electronic mail system or groupware to communicate with individuals in headquarters-staff functions at my firm.	1	2 3 4 5	9
F2	I use a voicemail system to communicate with individuals in headquarters-staff functions at my firm.	1	2 3 4 5	9

Please answer the following questions about your selling style from *your* perspective.

#	Question	Never.....	Always	Don't Know
H1	I decide what products to offer on the basis of what I can convince customers to buy, not on the basis of what will satisfy them in the long run.	1	2 3 4 5	9
H2	I try to help customers achieve their goals.	1	2 3 4 5	9
H3	I try to sell a customer all I can convince him to buy, even if I think it's more than a wise customer would buy.	1	2 3 4 5	9
H4	I try to achieve my goals by satisfying customers.	1	2 3 4 5	9
H5	I try to sell as much as I can rather than satisfy a customer.	1	2 3 4 5	9
H6	A good salesperson has to have the customer's best interest in mind.	1	2 3 4 5	9
H7	I keep alert for weaknesses in a customer's personality so I can use them to put pressure on him to buy.	1	2 3 4 5	9
H8	I try to get customers to discuss their needs with me..	1	2 3 4 5	9
H9	If I am not sure a product is right for a customer, I will still apply pressure to get him to buy.	1	2 3 4 5	9

(I) Question Instructions:

1. Review the list of five activities labeled "A" through "E" below.
2. You have a total of 100 points to divide among the five activities.
3. Assign points to each activity based on how much time you spend on the activity relative to the other four activities.
4. Assigning the same score to two activities means you spend about the same amount of time on each. If a score is twice as big for one activity group as another, then that means you spend twice as much time on the first activity group as compared to the second group.
5. A score of 0, indicates you do not spend any of your time on that activity.
6. All the activity scores should add up to 100.

ACTIVITY GROUPS

(A). Selling existing products to customers.	_____
(B). Participating in activities related to new product development activities.	_____
(C). Resolving customer satisfaction issues.	_____
(D). Territory reporting and forecasting.	_____
(E). Training and education.	_____

TOTAL 100 pts

PLEASE CIRCLE THE LETTER OF THE ONE BEST RESPONSE FOR EACH QUESTION.

E3. How many years have you been a salesperson for this firm?

- A. *Less than 1 year*
- B. *1 to 3 years*
- C. *4 to 9 years*
- D. *10 years or more*

E4. What is your age?

- A. *Less than 30 years old*
- B. *30 to 44 years old*
- C. *45 years or older*

E5. What is the highest level of education you have completed? (circle one response)

- A. *high school*
- B. *some college*
- C. *bachelor's degree*
- D. *master's degree*
- E. *Ph.D.*

E6. Are you a member of any new product development committees or teams?

- A. YES
- B. NO

F3. I have access to an electronic mail system or groupware at my company.

- A. YES
- B. NO

F4. I have access to a voicemail systems at my company.

- A. YES
- B. NO

F5. How far is it from your office to where the new product development group resides?

- A. *Same building*
- B. *Different building, but the same campus*
- C. *Different building/campus, but less than 50 miles away*
- D. *50 miles or more away*

G1. Overall, my company's new product development process is (circle one):

- A. Informal
- B. Neither formal or informal
- C. Formal
- D. Doesn't Exist

APPENDIX M

PHASE TWO NEW PRODUCT DEVELOPMENT QUESTIONNAIRE

New Product Development Questionnaire

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1. Company _____

2. Name _____

3. Title-Dept. _____
(i.e. *R&D, Engineering, Product Management, Marketing, Other*)

4. What percentage of your product **improvements** are developed in (from idea to launch):

6 months or less	_____ %
7 months to 12 months	_____ %
13 months to 24 months	_____ %
> 24 months	_____ %
TOTAL	100 %

5. What percentage of your **new products** are developed in (from idea to launch):

6 months or less	_____ %
7 months to 12 months	_____ %
13 months to 24 months	_____ %
> 24 months	_____ %
TOTAL	100 %

APPENDIX N

VARIABLES AND THEIR MEASURES CONTAINED IN PHASE TWO SURVEY

CRITERION VARIABLE
Salesforce Involvement in NPD Predevelopment Activities

Measure Subscale	Measure Type	Measure Source	Survey Questions
ABF	5 point Likert Scale Never - Always	Developed in Study (Factor: NPD-initiated sales physical involvement)	11 Items: A3, A4, A5, A6, A8, A9, A10, A11, A16, A17, A18
CE	5 point Likert Scale Never - Always	Developed in Study (Factor: Sales-initiated physical involvement)	5 Items: A1, A2, A12, A13, A14
G	5 point Likert Scale Never - Always	Developed in Study (Factor: Sales cognitive involvement)	3 Items: A7, A15, A19

ORGANIZATIONAL PREDICTOR VARIABLES

H1: The stronger the relationships between departments, the greater the level of salesforce involvement. Interdepartmental relationships are represented by the variables:

Variable	Measure Type	Measure Source	Survey Question(s)
Interdepartmental Conflict	5 point Likert scale, agree - disagree	Jaworski and Kohli (1993)	#C1 through #C7 (7 items)
Interdepartmental Connectedness	5 point Likert scale, agree - disagree	Jaworski and Kohli (1993)	#D1 through #D7 (7 items)

H2: The greater the formality of NPD processes, the greater the level of salesforce involvement.

Variable	Measure Type	Measure Source	Survey Question(s)
NPD Formality	one, ordinal variable	none	#G1 (1 item)

H3: The greater the NPD cycle time, the lower the salesforce involvement.

Variable	Measure Type	Source	Survey Question(s)
NPD Cycle Time	two interval data questions	none	NPD team member survey

PERSONAL LEVEL PREDICTOR VARIABLES

H4: The greater a salesperson's employment of communication enablers, the greater his involvement. Specifically, communication enablers include:

Variable	Measure Type	Measure Source	Survey Question(s)
Access to E-Mail	one, dichotomous	none	#F3 (1 item)
Access to Voicemail	one, dichotomous	none	#F4 (1 item)
Usage of E-Mail	5 point Likert item, never - always	none	#F1 (1 item)
Usage of Voicemail	5 point Likert item, never - always	none	#F2 (1 item)
Proximity to NPD	one ordinal item	none	#F5 (1 item)

H5: The greater the salesperson's customer orientation, the greater his involvement.

Variable	Measure	Measure Source	Survey Question(s)
Customer Orientation	5 point Likert scale, never - always	Modified from Saxe (1979)	#H1 through #H9 (9 items)

H6: The greater the salesperson's NPD knowledge, the greater his involvement. A salesperson's NPD knowledge is denoted by the following variables:

Variable	Measure	Source	Survey Questions
Sales Experience	one ordinal item	none	#E3 (1 item)
Age	one ordinal item	none	#E4 (1 item)
Education	one ordinal item	none	#E5 (1 item)
Committee Membership	one, dichotomous item	none	#E6 (1 item)
Know where to send NPD ideas	5 point Likert item, never - always	none	#E2 (1 item)

H7: The greater the salesperson's perception of his value to NPD functions, the greater his involvement. Specifically, this perception is represented by the following two variables:

Variable	Measure	Measure Source	Survey Questions
Belief Information is Used	5 point Likert scale, agree - disagree	Scale Developed in this study	#B1 through #B5 (5 items)
Receipt of Feedback from NPD	5 point Likert item, never - always	none	#E1 (1 items)

**CONTROL VARIABLES AND
RELIABILITY MEASURE FOR CRITERION VARIABLE**

Control Variables	Measure Type	Data Source	Coding
Firm Size (Revenue Dollars)	single ordinal variable	Annual reports or press releases	1 = \$0 to \$300M 2 = \$300M to \$1B 3 = >\$1B
Type of Customers	single nominal variable	Sales executive	1 = Direct to Final customer 2 = Intermediate channels, final goods producers 3 = Both 1 and 2

Validity Measure for INVOLVE	Measure Type	Measure Source	Survey Question(s)
Salesforce Involvement in NPD Activities as a % of Overall Work Time	ratio measure	none	I (B)