

## **Competitive Paper**

### **After von Hippel: The State of User Involvement Research in New Product Development**

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### **After von Hippel: The State of User Involvement Research in New Product Development**

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#### **Abstract**

In the late 1970s, a new research impetus occurred in the new product development literature with the publications of Eric Von Hippel's two seminal investigations (1976; 1977), where he advocated the involvement of users in the idea generation stage of the new product development process. Von Hippel's conceptualisation of a customer active paradigm (1978) gave focus to a new generation of researchers and an emerging field of study into the involvement of users not only in the creation of ideas but to the whole new product development process. Over the last 25 years an impressive body of research has accumulated on the topic of user involvement and the purpose of this article is to synthesise and analyse that literature in order to assess the research progress in the area and also to assess our understanding of involving users in the development process. Based on the evidence reviewed, observations are drawn for future theoretical and empirical development in the field of user involvement

#### **Introduction**

In the late 1970s, a new research impetus occurred in the new product development literature with the publications of Eric Von Hippel's two seminal investigations (1976; 1977), where he advocated the involvement of users in the idea generation stage of the new product development process. Von Hippel's conceptualisation of a customer active paradigm (1978) gave focus to a new generation of researchers and an emerging field of study into the

involvement of users not only in the creation of ideas but to the whole new product development process (Foxhall and Tierney, 1984; Shaw, 1985; Voss, 1985; Parkinson, 1982; Biemans, 1991; Hakansson, 1987; Grooner and Humburg, 2000). Empirical analyses from numerous research studies offer convergent evidence of the positive influence user involvement has on the development process and consequently product success. (Gruner and Humburg, 2000). Maidique and Zirger (1985) analysis of 40 products demonstrated that customer involvement was a necessary ingredient for product success. Similarly in Germunden et al's (1992) study, which concentrates on new product development in a network context, nearly 50 per cent of companies claimed that forming relationships with customers "had been a precondition for innovation success" (1992: 367). From analysing 34 medical equipment innovations, Shaw (1985) found that successful innovation is associated with continuous customer interaction throughout the development process. Additionally, research conducted by the International Marketing and Purchasing group (IMP) has provided supporting evidence that successful product development is significantly correlated to relationships with other parties such as a customer (Hakansson, 1987).

Over the last 25 years an impressive body of research has accumulated on the topic of user involvement and the purpose of this article is to synthesise and analyse that literature in order to assess the research progress in the area and also to assess our understanding of involving users in the development process. Due to the heterogeneous and somewhat contradictory nature of the literature, assimilating findings both within and across topical areas has seldom been conducted (Biemans, 1992). In the first part of the paper, extant research is classified based on research approaches used and into four themes. These themes are subsequently explored in detail. Observations are then drawn on the research approaches, the themes and the general state of the user involvement research post von Hippel.

### **Classification of the Literature and Dominant Themes**

The literature has been reviewed, analysed and classified utilising an approach that was adapted from the general outlines depicted by Hunt (1976), Krause and Ellram (1997), and Olsen and Ellram (1997). First, the contributions of the reviewed literature to the user involvement concept were identified and categorised under comparable headings. Four dominant categories or research themes emerged that appeared to integrate the key aspects of the research in the field, explicitly the foundations to user involvement, the methods of involvement, managing the process and the potential outcomes of user involvement in new product development. To facilitate a logical and straightforward approach to this paper, these research themes were utilised as a structural basis for this review.

Next, the literature was classified along two dimensions concerning their research methodology (see Table 1). The literature was first classified as either (1) empirical literature based on surveys, case studies, interviews or anecdotal evidence\* (2) conceptual / theoretical based literature which focuses on the development of models, concepts or propositions or (3) conceptual theoretical and empirical literature which typically develops a number of hypothesis and then tests these hypotheses empirically (Olsen and Ellram, 1997). The literature was further classified between the polarised dimensions of positive/ descriptive and normative / prescriptive. The key distinction between these two classifications is that the literature

in the positive / descriptive category attempt to describe, explain, predict, and understand processes, activities and phenomena that actually exist, while [the literature] in the normative / descriptive category seek to prescribe the activities in which organisations and individuals should be engaged (Olsen and Ellram, 1997: 222).

The research studies are classified between the prescriptive / descriptive dimension based on their main focus as some research studies while being primarily descriptive do provide some

normative prescriptions. In the following sections, the research approaches taken to the concept, post von Hippel are illustrated and described, as are the contributions of these studies to the understanding of the user involvement concept. It is important to note that only a few of the research writings listed in Table 1 directly and exclusively address user involvement. Other studies have been included in this review, because in their course of discussion about topics such as buyer-seller and supplier relationships, market competence, new product success and failure etc., they have identified and addressed issues that impact on the user involvement concept and so warrant inclusion. Finally, this review should indicate the existence of any research gaps in both the current literature and also in the research approaches taken to the concept, as well as providing researchers with an up to date assessment of the field. Table 1 depicts the classification of the selected literature according to the research approach taken.

**Table 1:** Classification of Research Approaches

		<b>Prescriptive/normative</b>	<b>Descriptive/positive</b>
Empirical	2,3	Dolan and Matthews (1993) (I)	
- Survey (S)			2 Pullman et al (2000) (S)
- Case Study (C)			2 Cristiano et al (2000) (S)
- Anecdotal (A)			2 Moore (1982) (I)
- Interviews (I)			2 Olson and Blake (2001) (C)
Conceptual and empirical	1,3,4	Biemans (1992) (C)	1,3,4 Gruner and Humburg (2000) (S)
	1,3,4	Hakansson, 1987 (C)	1,3 Hutt et al (2000) (C)
	2	Cicantelli et al (1993) (C)	1,3 Bruce et al (1995) (S)
			1,3 Johnsen and Ford (2000) (I)
			1,3 Biemans (1991) (C)
			1 Adams et al (1998) (I)
			1 Lukas and Ferrell (2000) (S)
			1 Shaw (1985) (I)
			1,3 Li and Calantone (1998) (S)
			2 Lilen et al (2002) (I + S)
			3 Reindfleish and Moorman(2001)
			3 Markham and Griffin (1998) (S)
			3 Littler et al (1995) (S)
			3 Schrader and Copfert (1998) (I)
			3 Bidault and Cummings (1994) (C)
			3 Athaide and Stump (1999) (S)
			3,4 Campbell and Cooper (1999) (S)
			4 Gales and Mansour-Cole (1995)(S)
			4 Germunden et al (1992) (S)
Conceptual / theoretical	1	von Hippel (1986)	2 Kaulio (1988)
	1	Milson et al (1996)	1,3 Biemans (1995)
	1	Tidd et al (2001)	
	1	Johne (1994)	
	1,3	Mohr and Spekman (1996)	
	2	von Hippel and Katz (2002)	
	2	Von Hippel (2001)	
	3	Pitta et al (1996)	

The numbers indicate the themes in the research studies:

1 Foundations of user involvement

2 Methods of user involvement

3 Managing user involvement

4 Outcomes of user involvement

### **Theme 1: Foundations for Successful User Involvement**

A number of research studies classified in Table 1 have identified and described a number of strategic foundations that are necessary prerequisites to successfully involving users in the product development process. Without the presence of these supporting foundations, the relationship may be unsound and consequently collapse and fail. The importance of these strategic foundations is apparent in the quantity of studies that have investigated the phenomenon (Gruner and Humburg, 2000; Li and Calantone, 1998; Bruce et al, 1995; Hutt et al., 2000; Mohr and Spekman, 1996; Hakansson, 1987; Milson et al, 1996). Under this theme, the research approaches are both descriptive and normative, with the majority of studies employing an empirical methodology favouring the use of surveys and case study. A number of research writings also provide normative suggestions, prescribing activities organisations should engage in. These articles are classified as both conceptual/theoretical and conceptual/empirical (von Hippel, 1986; Milson et al, 1996; Tidd et al 2000; Biemans, 1992; Hutt et al, 2000; Hakansson, 1987). In the next three sections, the strategic foundations that provide the necessary antecedent conditions to successful user involvement are reviewed under three recurring categories in the literature, namely 1) *Internal Foundations*, 2) *External Foundations* and 3) *Interaction Foundations*.

#### *Internal Foundations*

Explicit discussion in the new product development literature has revealed that successful product development and successful user involvement in the development process depends upon the support of the internal organisation and can be conceptualised as follows:

##### 1) Fit with Business Strategy

A very important internal foundation to successfully involving users in the development process is the understanding of the fit between the proposed collaboration and the existing competence base within the organisation (Tidd et al 2001; Cooper and Campbell, 1999). Johnes (1994) suggest that companies must listen to their internal market in order to assess the extent to which the company is capable of meeting the identified challenge. Poor exploration of fit with business strategy can result in insufficient allocation of resources (time, money, technology and human) to the development project which can cause significant problems in the development process such as development activities taking longer than expected, consequently increasing costs, delaying time to market and even product failure (Biemans, 1992).

##### 2) Shared Vision Towards External Focus

A dominant uncertainty that emerges from the product development literature concerns understanding customer needs. There is little disagreement in the literature that meeting these needs is a prerequisite for successful product development. Tidd et al (2001) suggests understanding marketplace needs requires an organisational wide orientation to new stimuli from the outside, such as the involvement of users in the development process. Successfully involving an external party in the development process is a difficult task to achieve but is made even more complex when there is an absence of a shared organisational vision of the perceived importance of such an involvement (Tidd et al 2001). If a company does not understand or appreciate the value and importance of user involvement to successful product development, it is likely that this will contribute towards a myopic view towards external interaction. Such a company is unlikely to pursue any collaborative activities with the necessary enthusiasm that is needed for success. Creating an organisational atmosphere conducive to user involvement also requires the support and commitment of top management (Biemans, 1992).

##### 3) Marketing-R&D interface

The importance of the marketing-R&D interface to new product development is significantly highlighted by the amount of research that is emerging from the literature (Souder and Song, 1999; Song, Thieme and Xie, 1998; Jassawalla and Sashittal, 1999a; Kahn, 2001; Song,

Montoya-Weiss and Schmidt, 1997; Souder, 1988; Gupta et al. 1986; Olson et al. 2001; Norrøgen and Schaller, 1999). In general, findings from these empirical studies have found a positive influence between cross-functional interfaces and enhanced new product advantage as intra-firm competencies are brought together to develop a product that meets customer needs. To facilitate internal coordination between different boundaries, teams often referred to as cross-functional teams, are operationalized. Successful collaboration between functions requires a propensity from the participants to communicate, trust, coordinate, cooperate and to have an “integrated understanding of the breadth and often divergent motivations, agendas and constraints that exist at all times” (Jassawalla and Sashittal, 1999: 5). In actuality, the presence of these relational attributes is often cited as the cornerstones of most successful relationships, whether they are internal or external. However, the traditionally theoretician’s view of new product development contained no explicit recognition of the relationship between internal collaboration (e.g. the marketing – R&D interface) and external collaboration (e.g. manufacturer-user NPD relationship). On closer examination, these two forms of collaboration are highly interwoven, as the efficiency and effectiveness of the external relationship with the user depends upon and is influenced by the quality of the interface between the various functions within the organisation that are involved in the product development process (Biemans, 1991). Conversely, relationships with users can facilitate the inter-functional relationships. Users can provide stimulation of communication and often adopt the mediating role of conflict reducer (Li and Calantone, 1998).

#### *External Foundations*

A frequently mentioned antecedent to successful new product collaboration and user involvement is the consideration given to certain external issues such as:

##### 1) Customer knowledge competence

An important trend that is emerging in the new product development literature is the conceptualisation by several authors that new product development is an organisational learning process involving the acquisition, dissemination and utilisation of information (Li and Calantone, 1998; Adams, Day and Dougherty, 1998; Lukas and Ferrell, 2000). The extent to which a company has a competent customer knowledge process will be evident in the emphasis top management places on the perceived importance of involving customers in the development process. The ability of a firm to extract and integrate customer knowledge into the development process is considered by some as a strategic asset of the firm (Glazer, 1991), and by others as a core competence (Li and Calantone, 1998) that can have a serious impact on product success “because it enables a firm to explore innovative opportunities created by emerging market demand and reduce potential risk of missfitting buyer needs” (Li and Calantone, 1998: 16). Effective user involvement will be greatly enhanced by the presence of a competent customer knowledge process.

##### 2) The External Environment

The business network concept suggests that in order to successfully involve users in the new product development process, the two relationship partners must take the activities of their partners in connected relationships into consideration, thereby widening the scope of management, to include a set of connected relationships in a business network (Hakansson, 1987). In a strategic context, managing networks is crucial as networks can act as an enabler or as a constraint to collaborative new product development (Johnsen and Ford, 2000). The major disadvantages associated with developing new products in a network are the loss of proprietary information and critical knowledge, increased cost of coordination and dependency, the risk of dominance and exploitation and the lack of commitment of other parties. However, the literature reveals that the core issues of concern in managing user involvement within networks, is managing the position of the firm in the network and also managing the relationship with the firm’s environment (McLoughlin and Horan, 2000).

#### *Foundations for User Interaction*

The growing literature on new product development partnerships has indicated that successful management of user involvement in the product development process necessitates an undertaking of certain strategic issues prior to formal negotiations and involvement (Milson et al, 1996; Biemans, 1992).

### 1) User Characteristics

Prior research in new product development indicates that the characteristics of the customers in the new product development relationship will impact on product success, explicitly, characteristics such as the relative size of the two parties (Milson et al, 1996), the financial attractiveness of users (Gruner and Humburg, 2000), reputation (Gansen, 1994), technological expertise (Hakansson, 1987), knowledge (Shaw, 1985) and past experience with co-development (Bruce et al., 1985). Additionally, Biemans proposes that in order to fully optimise user involvement in new product development activities, manufacturers should “determine the partner’s representativeness, knowledge, objectivity, willingness to cooperate, market position, ability to keep confidential information, and ties to competitors” (1992: 210).

Johne (1994) warns that cooperative manufacturers “may end up acting as nothing more than a sub contractor for key customers” (52) and in order to overcome this limitation of collaborative relationships, manufacturers need “to discriminate between different types of customers” (52). In his study on the development of industrial new products, von Hippel distinguishes between general market users and lead users on two attributes; [1] lead users face needs that will be general in a marketplace - but face them months or years before the bulk of the marketplace encounters them and [2] they are well positioned to benefit significantly by obtaining a solution to those needs (von Hippel, 1986: 796). Numerous empirical studies offer supporting evidence that the involvement of users who possess these characteristics can result in higher novelty, higher sales and greater market acceptance of products developed as they are deemed to address more original needs (Lilien et al. 2002; Urban and von Hippel, 1988; Herstatt and von Hippel, 1992). Due to different user types and characteristics, users will vary in importance from stage to stage and so the identity of users employed will also vary during the development process (Biemans, 1992). The selection of users should be made very carefully and should be based on specific characteristics (Gruner and Humburg, 2000).

### 2) Compatibility of culture

Another strategic issue that needs to be considered is the compatibility of culture, which embraces goals, values, policies and managerial procedures (Bruce et al, 1995). Maron and VanBremen (1999) maintain that failure to accommodate for differing organisational cultures can result in the demise of a partnership, as underlying qualities (e.g. management and decision making styles) inherent in both partners can inhibit the collaboration success if they are not properly identified. Handy asserts that different cultural types “work on quite different assumptions about the basis of power and influence, about what motivates people, how they think and learn, how things can be changed. These assumptions result in quite different styles of management, structures, procedures and reward systems (1995: p. 11). For example a partner with a bureaucratic culture could have a climate not very conducive to collaboration, due to the lack of decision-making authority of executives. Similarly, an aggressive culture can induce a climate in which trust is diminished as the interpersonal relationship between partners can be dampened (Hutt et al., 2000). However, Kanter (1994) states that although differences between companies do not evaporate because of a partnership, “they can be handled so they don’t jeopardize it. Companies that are good at partnering take the time to learn about the differences early and take them into account as events unfold” (1994:105).

### 3) Clear objectives and division of roles

A third strategic issue that impacts on the positive outcome of the manufacturer-user new product development relationship is the establishment from the outset, a set of clear objectives, which will provide direction for the partnership (Millson et al, 1996). Biemans

determined that failure by partners to “unequivocally state their objectives, their expectations, and the criteria they will use to evaluate the cooperation...led to lack of commitment, unclear agreements, and delays and inefficiencies during the development process” (1992: 194). Similarly, Bruce et al (1995) states that establishing the roles and responsibilities of the parties is a necessity if the relationship is going to be successful. Joint participation in the setting of goals can establish mutual expectations and specifies to each party the cooperative efforts needed (Mohr and Spekman, 1996). Millson et al (1996) propose that new product development partners need written agreements as they “can provide clear direction for NPD programs and... eliminate some uncertainty” (43).

### **Theme 2: Methods of User Involvement**

A diversity of research approaches has been used to study the modes of user involvement in the development process as is evident from Table 2. The research approaches are represented by both descriptive and normative studies, as well as conceptual and empirical studies. The majority of research studies are categorised as empirical and descriptive/positive, which indicates a strong practitioner oriented focus to the research approach (Olson and Blake, 2001; Pullman et al 2000; Cristiano et al 2000; Moore, 1982; Lilen et al 2002). Empirical methodologies tend to favour surveys and interviews. A number of the articles also provide normative suggestions for involving users in the development process, such as Cicantelli's et al (1992) experience with consumer idealised design, von Hippel's lead user analysis and Dolan and Matthews (1993) managerial guide to beta testing. From the research studies reviewed, five dominant methods emerge for involving users in the development process and are described as follows:

#### *Lead User Analysis*

This method is an approach that aims to incorporate highly innovative users in the development process through four phases: [1] Identify the key company stakeholders and select the general target market and the type and level of innovation required, [2] Identify leading experts in the field who understands and recognises the important market and technical trends in that field, [3] Identify, learn from and analyse lead users in the field of interest, and [4] Improving the preliminary concepts and evaluating them in terms of technical feasibility, market appeal and management priorities (Lilien et al, 2002). Lead users are described as knowledgeable, often technically trained and have considerable interest in and experience with the manufacturers product (von Hippel, 1986) and are extensively involved in the process of finding solutions to their own problems (Kaulio, 1998). Although traditionally this method was confined to the involvement of users in the idea generation stage of product development, it has however, in recent studies been extended to include users in the preliminary design and prototyping stages through the use of innovation toolkits (von Hippel, 2001; von Hippel and Katz, 2002). However, recent research has shown that while lead user analysis can be a valuable means of generating ideas, its implementation requires extensive effort on the part of manufacturers and so can be quite easily discontinued by manufacturers (Olson and Blake, 2001).

#### *Consumer Idealised Design*

This method involves the consumer in the actual design of a new manufactured product. From a functional point of view, this approach proposes that the average user, equipped with the proper tools is the most suitable candidate to design a product. In a process similar to that of focus groups, a small group of selected target market users, lead by a moderator are asked to design a completely new product instead of an existing one. Specifications can include any feature desired by the participant, no matter how outrageous. All design options are then debated and modified until one remains that incorporates all of the participants idealizations (Ciccantelli and Madigson, 1993).

#### *Quality Function Deployment*

This is a method for bringing the voice of the customer into the development process and as being described as a technique to guarantee that customer needs drive the product design and manufacturing process (Kaulio, 1998). The typical approach to quality function deployment centres around a four phase process: [1] customer needs are translated into one or more design independent and measurable engineering characteristics using a product planning matrix often referred to as the House of Quality. After prioritising the quality characteristics from a customer perspective, preliminary specifications for the desired level of performance are selected based on competitive benchmarking. [2] After selecting the design concept, components are designed or features specified that would satisfy the desired quality performance level. [3] A production process is designed that can manufacture design features, parts or components from the second phase and [4] The key manufacturing processes are translated into work instructions, control and reaction plans, and the training requirements necessary to ensure manufacturing quality (Pullman et al. 2002; Cristiano et al. 2000). However, with this method feedback from customers in the latter stages of the new product development process is not explicitly sought, the involvement of users only occurs in the initial stages of the design process.

#### *Beta testing*

In a consumer setting, this approach aims to determine if the product does what it is designed to do (Kaulio, 1998). In order to test customer satisfaction and the products ability to perform in a real working situation, a prototype is placed with specific customers. Feedback is collected through retrospective studies or observation and any deficiencies in the product are rectified (Dolan and Matthews, 1993). Beta testing is frequently used in software engineering, for example, Microsoft incorporated users into all phases of their new software development process through the establishment of beta sites (Li and Calantone, 1998).

#### *Concept testing*

The purpose of the concept test centres around generating representative estimations of market reaction to, their intentions to buy, positioning and perceptions of a proposed concept (Rosenau et al., 1996; Moore, 1982). After the information is collected and analysed, decisions have to be made regarding the continuation of the concept to the next stage, because the decision to move beyond this stage can involve substantial monetary costs (Baker and Hart, 1988). In order to extract specific responses from customers, a number of stimulus materials can be used such as prototypes, mock-ups, sketches etc and this should provided the customer with a realistic description of the proposed product. Kaulio (1998) recommends that concept testing should be supplemented with later prototype evaluations such as beta testing.

### **Theme 3: Managing User Involvement: The Relationship**

A number of studies attempt to describe the management of seller-buyer interactions during new product development (Biemans, 1991, 1992; Hutt et al, 2000; Bruce et al, 1995; Athaide and Stump, 1999; Bidault and Cummings, 1994; Mohr and Spekman, 1996; Johnsen and Ford, 2000). The research studies are primarily classified as prescriptive/normative and conceptual/empirical in Table 2. Among these empirical studies, there is an emphasis on case study methodology. Articles have also been classified as positive descriptive and empirical/conceptual and theoretical (Gruner and Humburg, 2000; Li and Calantone, 1998; Campbell and Cooper, 1998; Markham and Griffin, 1998; Littler et al, 1995; Scrader and Copfert, 1998; Reindfeish and Moorman, 2001; Biemans, 1995). While some of these studies are not specifically investigating the management issue, they have contributed to the understanding of the phenomenon through their descriptions and explanations of certain enabling and prohibiting relationship processes and so they are included in Table 1.

An important point to make is that apart from the managerial models presented by Biemans (1992), there is a paucity of managerial models to maximise user involvement in the development process. This absence of managerial guidelines has serious consequences for

practitioners. There is evidence to suggest that the manner in which the user involvement is managed will affect the success of the outcome and consequently reduce the likelihood of guaranteeing success (Hakansson, 1987). Illustrating the need for managerial guidelines, Bidault and Cummings warns that the rewards of cooperative relations with users may not be realised in practice as a result of the fundamental tension that exists “between the dynamics of innovation and the logic of partnering” (1994: 33). This tension may arise due to the dangers of opportunism, the leakage of proprietary information, the allocation of property rights, the reduction in direct control over the development process, the additional financial and time costs associated with the management of the user relationship and the generation of inaccurate or unrepresentative information due to the limited domain of customer expertise (Schrader and Copfert, 1998; Dolan and Matthews, 1993; Littler et al. 1995). Research has also identified and highlighted some additional uncertainties associated with involving users in new product development such as increased dependency, lack of commitment, partner selection, timing and intensity of user involvement, market knowledge competence and damaged relationships (Biemans, 1991; 1992; 1995; Dolan and Matthews, 1993; Leonard-Barton 1995; Li and Calantone, 1998). However, these uncertainties do not imply that practitioners or academics should disregard the importance of actively acquiring, interpreting and integrating customer knowledge in to the development process, it merely emphasises that in order to fully optimise user participation and overcome the problems associated with effective user cooperation, careful consideration must be given to the management of the process (Biemans, 1992; Schilling and Hill, 1998; Campbell and Cooper, 1999). The literature highlights seven factors that contribute to successful management of users in the development process: [1] *Appropriate Project Structures* [2] *Contending with a Taxonomy of relationships*, [3] *Building and Maintaining Trust*, [4] *Identifying and Motivating the right people*, [5] *Equity*, [6] *Communication* and [7] *Auditing the Relationship*.

#### *Appropriate Project Structures*

Crucial to successfully involving users is the need for a good match between the demands for the development and the operating structure that enables it (Tidd et al 2001). To achieve this balance, Pitta et al (1996) suggest that companies must meld the contribution of internal cross-functional teams and external teams into an organisational boundary spanning team. Within these teams, customers are considered partners in the development and have equal responsibility for problem solving. Pitta et al also suggest that the team must be structured to ensure continuous communication between members as this can avoid misunderstandings and conflict. Also the team must be structured to allow for managing performance. Vital to the success of boundary spanning teams are some of the strategic foundations already discussed such as having internal cross functional teams, clear roles and objectives and selecting the customer based on their characteristics and their commitment to contributing to the solution (Pitta et al 1996).

#### *Contending with a Taxonomy of relationships*

Not all relationships are created equally, nor do they provide the same value or contribution to a company. Within the context of new product development, depending on the contribution or resource, the identity of the users actually employed typically varies with the stage of the product development process as does the extent and intensity to which the user is involved (Biemans, 1992; Gruner and Humburg, 2000). However, one of the critical elements in obtaining the benefits of user involvement in product development is an understanding of the appropriate form that involvement should take, as the time and effort spent on coordinating and managing their involvement in the process will vary depending on the intensity of involvement. For example, a relationship characterised by a high degree of user involvement would warrant a greater amount of management attention in relation to communication, coordination, commitment etc. and a higher reliance on partnership trust, than a low user involvement product development relationship. If a manufacturer does not distinguish between different types of user involvement, then they will ultimately spend as much time coordinating and managing non-essential relationships as they would the more profitable ones

(Wynstra and Pierick, 2000). By prioritising the degree of involvement a party may have in the new product development process, management are provided with the necessary support to make decisions relating to the optimal use of strategic and non- strategic resources. Hence, ensuring that the most appropriate party is involved at the right time, at the right intensity of involvement and with the most appropriate form of governance in place (Wynstra and Pierick, 2000). Biemans proposes that the extent of user involvement can be conceptualised along a continuum ranging from no interactive relationship to joint performance of activities because “in some cases the interaction may consist of no more than an ad hoc visit in order to gather specific information, other interactions may amount to an extensive cooperation project” (1992: 143) (see Table 2).

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**Table 2:** A Continuum of Customer Interaction Intensities in the New Product Development Process

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No interactive relationship: The user is not involved in the product development process

Passive acquisition of resources: In a passive, ad hoc way a manufacturer can obtain resources, usually information as input to the NPD process.

Active acquisition of resources: In a predetermined manner, the manufacturer can obtain resources such as information through a systematic interviewing process of a selected group of major customers in order to determine future requirements

Response, feedback on specific issues: Manufacturers may approach major customers in order to acquire a response on a specific issue such as evaluating a tentative concept

Separate performance of specified activities: Manufacturers and users conduct clearly defined of activities separately

Joint performance of specified activities: The manufacturer and the user jointly perform clearly defined activities

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(Source: Biemans, 1992)

Viewing customers as portfolios of new product development relationships, Athaide and Stump (1999) maintain that customers can be managed strategically between two diametrically opposed dimensions, namely unilateral-seller led interactions and bilateral collaborations. At the lowest level of customer involvement, product development is depicted as a unilateral process. This relationship type is characterised by low levels of commitment from either party. Conversely, a bilateral product development relationship encompasses mutual commitment to the development project, “involves more intense bi-directional flows, and entails active buyer involvement from the outset of the NPD process” (Athaide and Stump, 1999: 12).

#### *Building and Maintaining Trust*

Foremost among the cited influences on manufacturer-user relationships is commitment and trust as “successful alliances, like successful marriages, don’t just happen; both require commitment to make them work, and both can be destroyed by mistrust” (Morgan and Hunt 1994: 25). A posited consequence of trust and commitment is cooperation, firms learn that coordinated, joint efforts can achieve mutual or singular outcomes that far exceeds the benefits a firm can procure by acting solely in its own best interest (Anderson and Narus, 1990). Building and maintaining trust results from frequent communication among the partners and the belief that the other is reliable and has high integrity, which are associated

with the partner's consistency, competence, honesty, fairness, responsibility, willingness to act, helpfulness and benevolence (Morgan and Hunt, 1994; Buttle, 1996). Trust is also fostered, by encouraging individuals from both the manufacturer and customer companies to interact with one another, in an attempt to develop interpersonal ties (Hutt et al. 2000). These social ties provide an alternative route to conflict as "personal relationships increasingly supplement formal role relationships and informal psychological contracts increasingly substitute for formal legal contracts" (Hutt et al 2000: 52). Additionally, strong social ties promote the exchange of information. Organisations are less fearful of being opportunistically exploited by companies that they share high levels of embeddedness with (Reindfleish and Moorman, 2001).

### *Identifying and Motivating the right people*

Relationships are socially constructed, people interact with one another across organisations and it is these individuals who construct relationships (Granvotter, 1985). The people factor is central to all relationships and so the actions and commitments of the people involved in a collaborative relationship are paramount to success (Bruce et al. 1995). Motivating certain individuals to take an active role in the development can have a fundamental impact on the success of the project. Numerous authors refer to individuals [from both manufacturing and consumer companies] who are capable of marshalling support, overcoming obstacles and virtually pulling the development project to completion by their sheer will and energy as product champions (Biemans, 1992; Markham and Griffin, 1998). These are individuals characterised by energy and passion and who will act as the driving force behind the venture. Numerous studies have concluded that product champion can be an essential ingredient to the success of new product development (Biemans, 1992; Frey, 1991; Howell and Higgins, 1990). Additionally, Tidd et al (2001) highlights the importance of identifying other key enabling figures such as organisational sponsors, team members and the business innovator.

### *Equity*

The presence of mutuality and reciprocity within a relationship has been acknowledged in the literature has been an essential ingredient for success in any collaboration (Morgan and Hunt, 1994; Hutt et al, 2000). Dissatisfaction and resentment may ensue if one party believes that its contribution to the new product development relationship far exceeds that of its counterpart. On an equitable basis, both parties to the relationship must receive added benefits (Bruce et al, 1995). Expectations of perceived equality can be reduced with one party's failure to adhere to agreements (Biemans, 1992). Ensuring perceived equality between collaborators does not become a major issue, Bruce et al. (1995) suggests that the "level of contribution can be monitored during progress reviews"

### *Communication*

Central to connecting people together and consequently developing relationships is the act of communication. It has been described "as the glue that holds together a channel of distribution" (Mohr and Nevin, 1990: 36) and as the lifeblood and circulatory system of the organisation (Schein, 1994). The communication process underlies most aspects of organisational functioning and without it "organising could not occur" (Euske and Roberts, 1987: 42). In order to ensure an effective and efficient coordination and management of activities, responsibilities and people within the manufacturer-user new product development relationship, an atmosphere conducive to frequent and timely communication, both internally and externally must be created and maintained (Biemans, 1992; Bruce et al, 1995; Donaldson and O' Toole, 2002; Mohr and Spekman, 1994; Hakansson, 1987). Regular communication (such as consultations at all levels, progress reviews etc.) reduces uncertainty and ambiguity in the relationship by achieving a shared understanding of the goals and objectives of the partnership (Hutt et al., 2000). Additionally, communication between the manufacturer and user should facilitate the development of trust and social ties between personal from both companies and result in a higher degree of reciprocity, closeness and sharing of proprietary information among the relationship participants (Reindfleish and Moorman, 2001).

Underlying anxieties, concerns, frictions or conflicts may be resolved amicably in relationships characterised by good quality communication flows (Mohr and Spekman, 1996), as disagreements are seen as being “just another way of doing business” (Anderson and Narus, 1990).

#### *Flexibility*

Managing change can be very problematic as human beings have a tendency to view change as threatening or problematic and consequently tend to resist or to be cautious about change. Within the context of cooperative development project, surprises are likely to occur and management must be flexible in order to adapt and respond to change (Biemans, 1992). A relationship that does not accommodate for flexibility cannot implement quickly any desired response when circumstances change such as market conditions (Bruce et al, 1995; Biemans, 1992).

#### *Auditing the New Product Development Relationship*

Regular progress reviews on the relationship have been quoted as having a positive influence on the success of the new product development collaboration (Bruce et al. 1995; Hutt et al. 2000). A regular audit allows parties to assess the performance of the relationship, while also addressing issues relating to management and leadership, team building, control processes, conflicts etc. Audits can be particularly beneficial in identifying, isolating and rectifying any problems that may exist in the relationship, as well as creating the perception that each party must adhere to pre-determined agreements. An additional benefit of these progress reviews is that participants are continuously learning through communication, the process of interaction. Auditing the relationship also provides relationship benefits in terms of “identifying loose connections, key personnel who are not part of the central flow, and relationship ties that are a major asset – as well as those that require special attention” (Hutt et al. 2000:61).

#### **Theme 4: Outcome of User Involvement in the New Product Development Process**

Apart from Biemans (1992) case research in the Dutch medical industry, the research approaches are primarily conceptual empirical with a strong emphasis on survey methodology. These studies typically provide only descriptive data on the performance implications of customer interaction. However, from the literature the potential outcomes of user involvement can be categorised between macro and micro outcomes.

At a macro level, the product development outcome is products and services that fits the needs and wants of the market better, a reduction in the cost of development, improved product quality, access to new technologies, reduced development time and an enhanced likelihood of product success (Hakansson, 1987; Biemans, 1992; Germunden et al 1992; Gales and Mansour-Cole, 1995; Gruner and Humburg, 2000).

At a micro level, the outcome of user involvement can be significant in terms of its contribution to the development process. These contributions relate to the generation of new ideas, providing information on user requirements, commenting on new product concepts, assisting in the development and testing of prototypes and providing assistance in the marketing of the innovation (Biemans, 1992).

#### **Observations on The Current State of User Involvement Research in New Product Development**

A number of important observations can be made about the current state of research in the field. Chief among these is the paucity of the literature, post the call by von Hippel for more work. His seminal legacy of ideas still requires much research. Perhaps, one of the reasons for the slow progress in the field of user involvement research is that past research as tended to approach the concept from a mechanistic perspective – the focal firm organises user involvement in a hierarchical rather than a collaborative way. User involvement implies a collaborative approach to new product development. Involving users in this deep sense is

likely to be the preserve of the few. Making users equal partners is challenging to employees and to firms boundaries. Indeed network embeddedness presents a further layer of complexity to this dyad. If collaborative user involvement is scarce, then it implies an impetus to research it even greater as it might provide potential competitive advantage.

The immediate context for the instigation of this review has been the growing importance the literature assigns to the involvement of customers in the development process. Development projects that 'build in the voice of the consumer' have been reported with double the success rates and up to 70% higher market shares than those projects that do not involve users (Cooper, 1999). In fact, from a performance perspective, it is almost an axiom of the literature that user involvement in the development process is a necessary precondition to success (Maidique and Zirger, 1985; Germunden et al, 1992; Voss, 1985). However, despite the importance that these studies assign to the user involvement concept, only a small few could be considered specialist studies, in that they have specifically investigated the performance implications of customer interaction or involvement in the new product development process (Biemans, 1992; Parkinson, 1982; Grooner and Humburg, 2000; Shaw, 1985; Campbell and Cooper, 1999). Moreover, with the exception of Campbell and Cooper's (1999) study and Gruner and Humburg's (2000) empirical investigation in to customer interaction and new product success, the few existing specialist studies typically provide only descriptive data on the performance implications of customer interaction, illustrating a major research deficit in the area. This echoes the warnings of Johnsen and Ford (2000), who stated that it has not been well established in the literature whether and how the potential outcomes of user involvement materialise, emphasising the need for more in-depth research on the performance implications and outcomes of involving users in the development process.

The next observation that can be made relates to managerial issues. While few would disagree that fundamental to new product success is a strong customer and market orientation, there is however a scarcity of guidelines on how this should be accomplished (Biemans, 1992). From Table 1, it can be readily observable, that the research approaches taken to the management of user involvement lacks an empirical normative focus. With the exception of Biemans (1992), very little empirical research has been devoted to how practitioners can achieve the potential advantages of involving users. Normative prescriptions that do exist tend to be few, broad in nature and borrowed from other research fields. This absence of empirically tested normative guidelines has serious consequences for practitioners. Without a clearer understanding by academics of the managerial guidelines necessary to effectively involve users in the development process, the benefits of actually collaborating with users in practice will be even more difficult to achieve. In this regard, this article may provide some assistance, a tentative managerial model is proposed that encapsulates the main issues identified in this review in relation to the management of users in the development process (see Table 3). The model follows the prescriptions of Moller and Halinen, who suggest that management can be segregated into "interrelated clusters of managerial issues and the domains of scientific explananda" (1999: 416). They along with other authors such as Ford and McDowell (1999), Donaldson and O' Toole (2002), Biemans (1992) have conceptualised the complexity of relationship management as existing on several dimensions. The logic pertaining to this tentative framework is straightforward; the interrelated management of the three levels is a prerequisite for managing user involvement in the new product development process. The model illustrates that managing user involvement is not a static process but must be conceptualised as a set of interrelated activities that are constantly in a state of dynamics. This model is only a starting point on the path to understanding the complexity of the dynamics that is occurring in the manufacturer-user relationship. To understand and capture this complexity would involve researching and identifying the sub-enabling process of managing user involvement in the new product development process. For a managerial model to rely on normative prescriptions alone would be tangential. User involvement is a fluid, dynamic process. Capturing this process represents a methodology for change in practice and in the mindset needed for a partnering perspective.

**Table 3:** A Tentative Framework for Managing User Involvement in the New Product Development Process

Managerial Issues	Description of Activity
Foundations to user Involvement	
Internal Foundations	<ul style="list-style-type: none"> <li>- Ensure a fit with business strategy</li> <li>- Have a external focus</li> <li>- Ensure an effective intra-functional collaboration exists</li> </ul>
External Foundations	<ul style="list-style-type: none"> <li>- Develop a strong customer knowledge competence</li> <li>- Monitor network influences on the new product development relationship</li> </ul>
Interaction Foundations	<ul style="list-style-type: none"> <li>- Select the user carefully</li> <li>- Accommodate for differing organisational cultures</li> <li>- Establish clear objectives and division of roles</li> </ul>
Methods of User Involvement	<ul style="list-style-type: none"> <li>- Identify and target lead users</li> <li>- Use appropriate mode of involvement depending on the stage</li> </ul>
Managing User Involvement	<ul style="list-style-type: none"> <li>- Establish appropriate project structures</li> <li>- Contending with a taxonomy of relationships</li> <li>- Determine the extent of user involvement</li> <li>- Determine the timing for user involvement</li> <li>- Build and Maintain Trust</li> <li>- Identify and Motivate the right people</li> <li>- Ensure a presence of mutuality and equity exists within the relationship</li> <li>- Communicate openly and extensively</li> <li>- Establish social ties</li> <li>- Audit the Relationship.</li> </ul>

The third observation that has emerged from this review concerns research methodology. Understanding, integrating and managing the how, when and extent of user involvement requires investigative research methodologies that will capture and provide analysis of the context and the process involved in the user participation. Considering the number of variables one must take into account when investigating the concept, it is surprising that apart from a small number of specialist studies conducted in the IMP, very few investigations have employed in-depth case research to the concept (Biemans, 1991; Hakansson, 1987). Conceivably, an under utilisation of case research may result in a less than comprehensive understanding of the concept. Regarding the application and utilisation of the survey methodology, there is a serious deficit of measurable scales to investigate the phenomenon. In the past researchers "have drawn on very simple and mostly single item measures" (Gruner and Humburg, 2000:12). Greater emphasis must be placed on scale development and validation, which will provide a greater clarification and understanding of the key constructs of the phenomenon and allow researchers to build upon each other's work. It is important to note that the authors are not advocating one methodology over the other, in fact the authors believe that in order for this field of research to grow and develop, consideration must be given to both. This belief stems from the realisation that case research can be utilised to capture the dynamics that is occurring in the collaborative relationship, while surveys can be

used to generalise findings. Furthermore, the field of user involvement research can be greatly advanced by more longitudinal studies; for example, researchers could establish research panels of organisations and their users and continuously monitor developments over time.

Finally, despite the prognosis of many authors that the user involvement concept would transform and improve product development and performance, the disconcerting evidence shows a very slow up take among practitioners of the user involvement concept. For the literature to move forward and to be of use to practitioners, research efforts must be directed towards addressing some of the key issues addressed in this paper. Over the last twenty-five years we have learned a lot about user involvement in the development process, however a lot more work needs to be done. This article is part of an ongoing research project in to the integration and management of users in the new product development process.

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