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**A Knowledge Based View on Product Development: Managerial concerns at the  
Marketing –Operations Interfaces**

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**1. Introduction**

New Product Development (NPD) is an interdisciplinary activity requiring contributions from nearly all the functions of a firm, whether it is an upgrade of an existing product or a new concept either to the firm or the market. Traditionally NPD has been viewed as an organizational activity due to various functional activities performed in stages from concept development to product delivery. The new product development (NPD) process has a long history of academic and practitioner interest and a well-established foundation

linking innovation development success and overall business achievement (Cooper, 1990).

The concept of NPD process has been described, researched (Booz Allen and Hamilton, 1982; Cooper and Kleinschmidt, 1986; Nakata, 1996), and adopted by a majority of firms engaged in innovation development and implementation (Griffin, 1997). There is general agreement among researchers that a new product is derived from being conceived, tangibly developed, produced, and launched into the marketplace.

It has been noted in the context of NPD, information must be shared between multiple departments over the course of a project and at the appropriate time as successful development requires communicating and integrating information (Griffin and Hauser, 1996). Information sharing is achieved when there is timely and free exchange in the form of plans, goals, and motives (Ayers *et al.*, 1997) and the dissemination of market-oriented information. Greater information sharing can facilitate NPD, as team members better understand the outcome of their behaviors.

Research evidence has suggested that the effect on new product performance is stronger with integration measures of inter-functional collaboration than simply measures of information flow between functions (Kahn, 1996; Kahn and McDonough, 1997). In order to achieve higher levels of performance in new product development (NPD), what is also needed is the integration of knowledge from past product development projects (Adams, Day, and Dougherty, 1998).

Innovation is a form of knowledge development or learning (Argyris and Schon, 1996; Nonaka and Takeuchi, 1995), and the cross-functional transfer of knowledge on an ongoing basis will make it much easier to forge links in terms of co-operation and mutual understanding in the NPD environment. An ongoing transfer of knowledge is enhanced by more frequent contact, which encourages the development of personal relationships and helps solidify existing relations between marketing and manufacturing personnel.

Environmental uncertainty has long been modeled as playing an important role in models of strategy, organizational structure and performance (Miles and Snow, 1978). In an environment characterized by high uncertainty, innovation strategy and organizing for innovation can make the difference between long term success or failure of the firm (e.g. aggressive “prospectors” versus the more cautious “analyzers” and “reactors” in the seminal Miles and Snow (1978)).

## **2. The NPD Process**

NPD is a complicated and time-consuming process in which several different activities are involved. Various researchers have proposed different ways of classifying the NPD process. Ulrich and Eppinger (1995) have established a generic development process that consists of five phases:

1. concept development
2. system level design;
3. detail design;

4. testing and refinement; and
5. production ramp up

Peters *et al.*(1999) identified three main process identification sections of the model:

1. Pre-design and development
2. Design and development
3. Post-design and development

Johne (1984), Nakata (1996) and Olson *et al.* (2001) suggest that the NPD process may be simplified into two main phases:

1. initiation, covering idea generation, screening and concept testing; and
2. implementation, embracing product development, test marketing, and product launch.

Rosenthal (1992) suggested four identification phases of NPD:

Phase 1 – Idea Generation and Conceptual Design.

Phase 2 – Definition and Specification.

Phase 3 – Prototype and Development.

Phase 4 – Commercialization.

It is widely recommended that NPD should overcome the phase-based process and move to the integrated and concurrent approach. While recognizing the benefits of concurrent engineering (CE), some researchers believe that all activities and phases will merely ‘phase out’, leaving the focus on parallel issues. However, even in the CE environment,

these physical phase or activities remain and are not completely mixed or blurred (Sun and Wing, 2005).

### **3. The Knowledge Based View**

Every theory of the firm is an abstraction of the real-world business enterprise which is designed to address a particular set of its characteristics and behaviors (Machlup, 1967).

Although strategic management has drawn its theories of the firm from both economics and organization theory, its area of interest is different from both. Its primary goals are to explain firm performance and the determinants of strategic choice. The resource-based view perceives the firm as a unique bundle of idiosyncratic resources and capabilities where the primary task of management is to maximize value through the optimal deployment of existing resources and capabilities, while developing the firm's resource base for the future.

To the extent that it focuses upon knowledge as the most strategically important of the firm's resources, it is an outgrowth of the resource-based view. At the same time, knowledge is central to several quite distinct research traditions, notably organizational learning, the management of technology, and managerial cognition. The issues with which the knowledge-based view concerns itself extend beyond the traditional concerns of strategic management – strategic choice and competitive advantage-and address some other fundamental concerns of the theory of the firm, notably the nature of coordination within the firm, organizational structure, the role of management and the allocation of

decision making rights, determinants of firm boundaries, and the theory of innovation (Grant, 1996).

The management literature has clearly recognized the epistemological distinction between “knowing how” and “knowing about” which is captured by distinctions between subjective vs. objective knowledge, implicit or tacit vs. explicit knowledge. ‘All learning takes place inside individual human heads; an organization learns in only two ways:(a) by the learning of its members, or (b) by ingesting new members who have knowledge the organization didn’t previously have’ (Simon, 1991). ‘Impersonal’ approaches to coordination involve ‘plans, schedules, forecasts, rules, policies and procedures, and standardized information and communication systems’ (Van de Ven *et al.*, 1976). Grant (1996) views organizational capability as the outcome of the firms’ ability to harness and integrate the knowledge of many individual specialists.

#### **4. Review of Literature**

Marketing experts have noted that NPD results are highly dependent on relationships between cross-functional team members (Kahn and Mentzer, 1998; Maltz and Kohli, 2000; Maltz *et al.*, 2001). This emphasis is understandable since sharing and using marketing information can only be done well when there is involvement (Song *et al.*, 2000), collaboration (Kahn, 1996; Kahn and McDonough, 1997), and managed conflict (Ayers *et al.*, 1997). Much of the research conducted in NPD focuses on integration between marketing and other cross-functional units such as engineering (Michalek *et al.*, 2005), R&D (Song *et al.*, 1996; Gupta *et al.*, 1985; Rein, 2004), industrial design

(Nussbaum, 2003; Veryzer, 2005), manufacturing (Kahn and McDonough, 1997), finance (de Ruyter and Wetzels, 2000), and information management (Bondra and Davis, 1996). Only recently has NPD research included three departmental perspectives such as manufacturing, R&D, and finance (Maltz *et al.*, 2001; Maltz and Kohli, 2000), and marketing, manufacturing and R&D (Olson *et al.*, 2001; Bond *et al.*, 2004). This is primarily due to the confidential nature of NPD and the labor and time intensive nature of securing responses from multiple participants within single or numerous organizations.

Potentially, conflict can arise between any two functional areas within a firm: marketing, manufacturing, design engineering, research and development, management information systems, accounting, finance, purchasing, and so on. Manufacturing and marketing can have diverse perspectives and motivations, which can be both advantageous and increase the potential for conflict (Crittenden *et al.*, 1993; Parker, 1994). However, the conflict between marketing and manufacturing is much more frequent (Hayes and Wheelwright, 1984) and has maximal impact on the customer and can potentially jeopardise the firm's survival in the marketplace.

Marketing and manufacturing functions are organisationally separate in most firms (Karmarkar and Lele, 1989). Marketing is concerned with revenue maximisation net of marketing and sales expenses through customer focus, competitive advantage, and environmental sensitivity; while manufacturing is typically concerned with cost minimisation (Brooksbank, 1991; Lilien and Weinstein, 1984). Marketing is rewarded for maximising customer satisfaction, providing a variety of options to the customers, and

achieving higher market share and market growth rate goals (Wind, 1981). Marketing, therefore, prefers short production lead times with many different product models, frequent model changes, customised orders, quick delivery and tight quality control. Manufacturing is rewarded for efficient resource utilisation, maximizing productivity, minimising production costs and achieving acceptable levels of service and quality (Janson, 1987). Consequently, manufacturing wants long and smooth production runs, standardised product, and minimum inventory. Design engineers get rewarded for keeping design of the products as simple and efficient as possible but at the same time reflecting the needs and preferences of the consumers. In trying to satisfy varied needs of consumers, they need to incorporate additional features and improvements in the product, making it more complex. Increased complexity of the product increases the design department's conflict with manufacturing (Mukhopadhyay and Gupta, 1998).

Marketing sets the policies of promotion and pricing and may not be aware of the constraints imposed by those policies on manufacturing and inventory decisions. Davis (1977) also describes the mismatch between sales and production regarding quantity and timing. Shapiro (1977) lists eight problem areas of necessary co-operation but potential conflict between marketing and manufacturing (Capacity planning and long range sales forecasting, Production scheduling and distribution, Delivery and physical distribution, Quality assurance, Breadth of product line, Cost control, New product introductions and Adjunct services), which has guided research on interfaces between the two functional areas.

Design as a separate functional area works closely with marketing (incorporating customer preferences) and manufacturing (receiving the design for production). Design influences the flexibility of sales strategies, speed of field repair, and efficiency and flexibility of manufacturing (Takeuchi and Nonaka, 1986). Interaction of design engineering with marketing and manufacturing gives rise to mutual conflict due to four of the eight problem areas identified by Shapiro (1977). These problem areas are: quality assurance, cost control, new product introductions, and adjunct services. A marketing manager acts as the channel of communication between the marketing environment and customer preferences, and the design department. Effective co-ordination among these areas, therefore, is vital for the effectiveness of the organisation. A marketing manager, therefore, needs to have an understanding of the nature of conflict that can arise between any two of these three areas and needs to have a framework for co-ordination.

Hausman and Montgomery (1990) argue that a linkage be established between the production priorities (cost, quality, dependability, short-term flexibility, and innovation), and the customer priorities – (price, quality, availability, variety, feature and post-sale service), using conjoint analysis. DeGroot (1991) first chooses the optimal mix of product variety as a function of the process flexibility and then considers optimal investment in process flexibility as a function of the variety of product line. He concludes that changes in marketing and manufacturing strategy should be planned and evaluated jointly. Cohen *et al.* (1992) focus their analysis on the new product development process to address the co-ordination between marketing and manufacturing by conceptually

dividing the process into three stages of activity: (1) development; (2) process (production); and (3) marketing.

Researchers from diverse disciplines have emphasized functional area interfaces (e.g. Clark and Fujimoto, 1991; Clark and Wheelwright, 1993; Hayes *et al.*, 1988; Souder, 1987; Urban and Hauser, 1993; Hill, 1994; Wheelwright and Clark, 1995). Interface approaches have been successful in conceptualising co-operation between the functional areas while preserving their separate identities. It seems appropriate, then, that a set of interfaces be used by a firm to minimise the conflicts between the two areas. The analysis will not be complete if we fail to recognise the design function as a closely related area. Ghose and Mukhopadhyay (1993) conceptualise quality as an interface between marketing and manufacturing with feedback mechanism for communication between the two departments.

Concurrent Engineering (CE) is defined as the systematic approach to the integrated, simultaneous design of both products and their related processes, including manufacturing, test, and product support. Objectives of CE are to achieve shorter time to market; lower product development costs; higher product quality; lower manufacturing, service, and testing costs; enhanced competitiveness; and improved profit margins (Mukhopadhyay and Gupta, 1998).

Leonard-Barton's (1992) knowledge set consists of four different knowledge dimensions:

1. Knowledge and skills embodied in employees.

2. Employee knowledge and skills embedded in technical systems.
3. The managerial system is the creation and control of knowledge.
4. The fourth dimension, values and norms, is infused through the other three dimensions.

According to the competence perspective and Leonard-Barton (1992), one must take in all four knowledge dimensions to understand variance in company performance and success. Furthermore, researchers in the competence perspective argue that the second and third knowledge dimensions stated above would be relatively easy for other companies to copy, and, as a consequence, they cannot alone explain differences in performance and success (Barney, 1991; Prahalad and Hamel, 1990).

## **5. Research Propositions**

There has been considerable research in the NPD arena and to a certain extent on the marketing-operations interfaces in the NPD process. The scope of research has varied from organisational decision making at the interfaces, attitudes and perceptions of both marketing and operations management towards each other and of their roles in the strategy process to behavioural issues and case study evidence of enhanced strategic performance by closer integration. However, there is not sufficient literature of knowledge based perspective on the marketing-operations interface areas in the NPD process. This paper is an attempt to present a knowledge based view proposed by Grant (1996) on a complex process of product development, with special reference to marketing-operations interfaces.

The product development process in our study has been divided into four stages drawing mainly from Rosenthal's model (1992): idea and concept development, specification and design, prototype and development, and production ramp up/ commercialization stage. It can be seen from literature survey that marketing, R&D and operations interaction is necessitated at different levels in the above stages. Although, the scope of our study involves marketing - operations interfaces, the importance of R&D / Design cannot be underestimated. Marketing would include sales and distribution activities, Operations in this paper would consider production and manufacturing issues, while R&D would signify design, development and engineering. In a functional perspective, marketing would define market segments and identify lead users and competitive products, design would investigate feasibility of product concepts and develop industrial design concepts while operations would estimate manufacturing costs and assess production feasibility (Ulrich and Eppinger, 1995).

It can be observed from literature that the maximum interaction between marketing and operations personnel occur at the initial concept development stage and later at the commercialization stage. Hence we shall narrow our scope to the marketing – operations interactions at these stages of product development only. However, the kinds of knowledge interactions vary considerably in these two stages.

The idea and concept stage in NPD involves a lot of brainstorming and intense cross departmental interactions between the different stakeholders. It calls for expertise in the

knowledge of the product, the market, the technology and the competitors. Most of the knowledge transfer at this stage is tacit in nature. In contrast, the stakeholders have a realistic picture of the environment in the final stage. They can utilize the distribution network at their disposal to ensure the delivery of the right quantity of the product at the right place. They also have the luxury of reorganizing the product volumes from the reaction of the market. In short, this stage calls for efficiency in utilizing the resources at the organization's disposal. Hence, most of the knowledge transfer that would occur in this stage would be explicit in nature.

For a better understanding of the idea and concept stage of NPD, it helps to break this stage (we call this stage as stage I subsequently in our paper) into five sub-stages based on past literature survey: Engineering and design feasibility, manufacturability, marketability, product value chain design and fulfillment of customer aspirations. It is interesting to note the varied degree of interaction between R&D, marketing and operations in the above sub-stages.

Similarly, the post production stage of NPD (we call this stage as stage IV subsequently in our paper), is broken into five sub-stages based on past literature survey for better clarity: Product variety capability, product volume capability, segment-wise value proposition to customer, supply chain strategy and design and PLC aspects. A critical examination will also reveal the varied degree of interaction between R&D, marketing and operations in these sub-stages.

Considering the knowledge based view stated earlier, we have grouped the issues to be investigated under three broad categories as under and can infer the following for the above two stages of the NPD process:

i) **Nature of Coordination:** The transfer of knowledge in stage I is predominantly tacit in nature. Tacit knowledge is not directly appropriable because it cannot be directly transferred: it can be appropriated only through its application to productive activity. A lot of the knowledge retained depends on the absorptive capacity of the recipient. Efficiency of knowledge aggregation is vastly enhanced when knowledge is expressed in terms of common language. Moreover, the type of interdependence within a task determines the mode of coordination (pooled, sequential, reciprocal and team) deployed. It is very important therefore, to explicitly state the roles, responsibilities, information flow and cross-functional groups at this stage for the later part of the NPD process. As this stage is characterized by increased task complexity and uncertainty, the mode of coordination tends to be non-standardized and highly interactive. This stage also requires cross-functional training of personnel involved in the NPD process as the complexity of 'broad-scale' integration creates higher causal ambiguity and greater barrier to replication (Grant, 1996). The higher the level and sophistication of common knowledge among the team, the more efficient is integration likely to be and also enhance the organizational capability.

The transfer of knowledge in stage IV is primarily explicit in nature. Most of the knowledge in this phase can be codified, ensuring that its transfer between personnel involved in this stage is faster and less costly (Kogut and Zander, 1992). Except for

patents and copyrights where knowledge owners are protected by legally established property rights, knowledge in this stage is generally inappropriable by means of market transactions. Much of this knowledge is created within the firm and is firm specific by integrating the knowledge of different individuals involved in this stage gained through routines guiding behavior. This stage is characterized by formal rules and directives to enhance efficiency and minimize communication gaps. The characteristics of the product, its physical inputs, and its production technology strongly influence the potential for sequencing, namely a product comprised of multiple components facilitates sequencing much more than a commodity produced by continuous processes. The organizational capability depends more upon the firm's mechanisms of integration rather than the extent of specialist knowledge which employees possess.

This would lead to the following propositions:

Proposition 1A: Transfer of knowledge between marketing and operations, as reported in stage I, is predominantly tacit in nature.

Proposition 1B: Transfer of knowledge between marketing and operations, as reported in stage IV, is predominantly explicit in nature.

Proposition 2A: It is difficult to appropriate knowledge transfer between marketing and operations in stage I.

Proposition 2B: It is relatively easier to appropriate knowledge transfer between marketing and operations in stage IV.

Proposition 3A: Stage I is characterized by pooled interdependence between marketing and operations personnel.

Proposition 3B: Stage IV is characterized by sequential interdependence between marketing and operations personnel.

ii) **Role of Management and Organizational Structure:** The conceptualization of the firm as a knowledge integrating institution has two main implications for the internal structure of the firm: the role of hierarchy and the location of decision making (Grant, 1996). Hierarchy is an efficient mechanism for coordinating a complex system because of its evolutionary and problem solving advantages (Simon, 1991). The grouping of individuals in this phase should be based on the intensity of interaction within the individuals (Thompson, 1967). Effective knowledge utilization in this phase requires that individuals occupy multiple organizational roles involving membership of multiple teams. Since the decisions involved in this stage make maximum use of tacit and idiosyncratic knowledge, it is in the best interest of the firm to have a decentralized structure. The role of the management is crucial in the way

they delegate decision making authority and frame incentive structures to achieve organizational goal alignment over divergent individual goals (Jensen and Meckling, 1976). It is also imperative for the management to create efficient report systems for controlling knowledge within the firm (Leonard-Barton, 1992).

Wruck and Jensen (1994) identify total quality management as a nonhierarchical, team-based organizing technology that permits an organization to access and utilize individuals' knowledge located at low levels of the organization. This would be an ideal structure for stage IV of the NPD process. Explicit knowledge in this stage is transferable, but cannot necessarily be aggregated at a single point. Decisions requiring access and processing of information are more likely to be centralized.

This would lead to the following propositions:

Proposition 4A: Organization structure in stage I should be decentralized, allowing for maximum utilization of tacit knowledge.

Proposition 4B: Organization structure in stage IV should be centralized, allowing for maximum utilization of explicit knowledge.

Proposition 5A: The training needs of personnel involved in stage I should be predominantly cross-functional in nature.

Proposition 5B: The training needs of personnel involved in stage IV should be predominantly specialized in nature.

iii) **Determination of Firm Boundaries:** An interesting feature of the knowledge-based approach is that it offers a theoretical basis for understanding a number of recent organizational innovations and trends. These include the renovation of traditional organizational structures through de-layering and empowerment and the development of new organizational forms including horizontal and team-based structures and inter-firm alliances. The knowledge-based approach also calls into question other contemporary trends in corporate management. The primary driving force behind corporate restructuring and strategic change has been the quest for shareholder power. If the primary resource of the firm is knowledge, if knowledge is owned by employees, if most of this knowledge can only be exercised by the individuals who possess it, then the theoretical foundations of the shareholder value approach are challenged. The amount of knowledge exchange within this phase is characterized by the firm's product variety (single product, multiple products) and its willingness to forge strategic alliances.

Proposition 6A: The amount of knowledge exchange within stage I is increased by the firm's product variety (single product, multiple products) and its willingness to forge strategic alliances.

Proposition 6B: The amount of knowledge exchange within stage IV is increased by the firm's product variety (single product, multiple products) and its willingness to forge strategic alliances.

## **6. Limitations and Future Scope**

This research has been primarily chosen for a knowledge based view on the NPD process. It is based on the assumption that the respondents are familiar with NPD processes. The authors have primarily taken the approach of Grant (1996) for postulating the knowledge based view. This article may be treated as a working paper as the propositions are still untested. The research propositions need to be empirically tested in the industry for validation and can be considered as future scope of work.

## **7. Reference**

Adams, M.E., Day, G.S. and Dougherty, D. (1998), “Enhancing New Product Development Performance: An Organizational Learning Perspective”, *Journal of Product Innovation Management*, Vol.15, No.5, pp.403–422.

Argyris, C. and Schon, D.A. (1996), *Organizational Learning*, Addison-Wesley, Reading, MA.

Ayers, D., Dahlstrom, R. and Skinner, S.J. (1997), “An exploratory investigation of organization antecedents to new product success”, *Journal of Marketing Research*, Vol.34, pp.107-16.

Barney, J. (1991), "Firm resources and sustained competitive advantage", *Journal of Management*, Vol. 17, pp. 99-120.

Booz, Allen and Hamilton (1982), *New Products Management for the 1980s*, Booz, Allen and Hamilton, Inc., New York, NY.

Bond, E.U. III, Walker, B.A., Hutt, M.D. and Reingen, P.H. (2004), "Reputational effectiveness in cross-functional working relationships", *Journal of Product Innovation Management*, Vol. 21, pp. 44-60.

Bondra, J.C. and Davis, T.R.V. (1996), "Marketing's role in cross-functional information management", *Industrial Marketing Management*, Vol. 25, pp. 187-95.

Brooksbank, R.W. (1991), "Successful marketing practice: a literature review and checklist for marketing practitioners", *European Journal of Marketing*, Vol. 25, No. 5, pp. 20-9.

Clark, K. and Fujimoto, T. (1991), *Product Development Performance*, Harvard Business School Press, Boston, MA.

Clark, K. and Wheelwright, S. (1993), *Managing New Product and Process Development*, The Free Press, New York.

Cohen, W. and Levinthal, D. (1990), "Absorptive capacity: A new perspective on learning and innovation", *Administration Science Quarterly*, Vol.35, pp.128-152.

Cooper, R.G. (1990), "Stage-gate system: a new tool for managing new products", *Business Horizons*, pp. 44-54.

Cooper, R.G. and Kleinschmidt, E.K. (1986), "An investigation into the new product process: steps, deficiencies and impact", *Journal of Product Innovation Management*, Vol. 3, pp. 71-85.

Crittenden, V.L., Gardener, L.R. and Stam, A. (1993), "Reducing conflict between marketing and manufacturing" *Industrial Marketing Management*, Vol.22, No.4, pp.299–309.

Davis, K.R. (1977), "The process of problem finding: a production-marketing example", *Interfaces*, Vol. 8, No. 1, pp. 82-6.

DeGroot, X. (1991), "Flexibility and marketing/manufacturing co-ordination", Working Paper, 91/60/TM, INSEAD, November.

de Ruyter, K. and Wetzels, M. (2000), "The marketing-finance interface: a relational exchange perspective", *Journal of Business Research*, Vol. 50, pp. 209-15.

Ghose, S. and Mukhopadhyay, S. (1993), "Quality as an interface between manufacturing and marketing: a conceptual model and an empirical study", *Management International Review*, Vol. 33, No. 1, pp. 39-52.

Grant, R.M. (1996), "Toward A Knowledge-Based Theory of the Firm", *Strategic Management Journal*, (Winter Special Issue), Vol.17, pp.109-122.

Grant, R.M. (1996), "Prospering in dynamically-competitive environments" Organizational capability as knowledge integration", *Organization Science*, Vol.7, pp.375-387.

Griffin, A. (1997), "PDMA research on new product development practices: updating trends and benchmarking best practices", *Journal of Product Innovation Management*, Vol. 14, pp. 429-58.

Griffin, A. and Hauser, J. (1996), "Integrating R&D and marketing: a review and analysis of the literature" *Journal of Product Innovation Management*, Vol.13, pp.191–215.

Gupta, A., Raj, S.P. and Wilemon, D. (1986), "A model for studying R&D–marketing interface in the product innovation process" *Journal of Marketing*, Vol.50, pp.7–17.

Hausman, W.H. and Montgomery, D.B. (1990), "Making manufacturing market driven", Working Paper No. 1103, Stanford University, Stanford, CA, October.

Hayes, R.H. and Wheelwright, S.C. (1984), *Restoring Our Competitive Edge: Competing through Manufacturing*, John Wiley, New York, NY.

Hayes, R., Wheelwright, S. and Clark, K. (1988), *Dynamic Manufacturing*, The Free Press, New York.

Hill, T. (1994), *Manufacturing Strategy: Text and Cases*, 2<sup>nd</sup> Edition, Richard D. Irwin, Burr Bridge, IL.

Janson, R.L. (1987), "Strategic market planning", in Greene, J.H. (Ed.), *Production and Inventory Handbook*, McGraw-Hill, New York, NY.

Jensen, M.C. and Meckling, W.H. (1976), "Theory of the firm: Managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, Vol.3, pp.305-306.

Johne, F.A. (1984), "How experienced product innovators organize", *Journal of Product Innovation Management*, Vol. 4, pp. 210-23.

Kahn, K.B. (1996), "Interdepartmental Integration: A Definition with Implications for Product Development Performance", *Journal of Product Innovation Management*, Vol.13, No.2, pp.137–151.

Kahn, K.B. and McDonough, E.F. (1997), “An Empirical Study of the Relationship among Collocation, Integration, Performance, and Satisfaction”, *Journal of Product Innovation Management*, Vol.14, No.3, pp.161–178.

Kahn, K.B. and McDonough, E.F. (1997), “Marketing integration with R&D and manufacturing: a cross-regional analysis”, *Journal of International Marketing*, Vol. 5, No. 1, pp. 51-76.

Kahn, K.B. and Mentzer, J.T. (1998), “Marketing’s integration with other departments”, *Journal of Business Research*, Vol. 42, pp. 53-62.

Karmarkar, U.S. and Lele, M.M. (1989), “The marketing/manufacturing interface: strategic issues”, Working Paper CMOM 89-10, Centre for Manufacturing and Operations Management, William E. Simon Graduate School of Business Administration, University of Rochester, Rochester, NY, December.

Kogut, B. and Zander, U. (1992), “Knowledge of the firm, combinative capabilities and the replication of technology”, *Organization Studies*, Vol.3, pp.383-397.

Leonard-Barton, D. (1992), “Core capabilities and core rigidities: a paradox in managing new product development”, *Strategic Management Journal*, Vol. 13, pp. 111-25.

Levin, R.C., Klevorick, A.K., Nelson, R.R. and Winter, S.G. (1987), "Appropriating the returns from industrial research and development", *Brookings Papers on Economic Activity*, pp.783-820.

Lilien, G. and Weinstein, D. (1984), "An international comparison of the determinants of industrial marketing expenditures", *Journal of Marketing*, Vol. 48, No. 1, Winter, pp. 46-53.

Machlup, F. (1967), "Theories of the firm: Marginalist, behavioral, managerial", *American Economic Review*, Vol.57, pp.201-220.

Maltz, E. and Kohli, A.K. (2000), "Reducing marketing's conflict with other functions: the differential effects of integrating mechanisms", *Journal of the Academy of Marketing Science*, Vol. 28, No. 4, pp. 479-92.

Maltz, E., Souder, W.E. and Kumar, K. (2001), "Influencing R&D/marketing integration and the use of market information by R&D managers: intended and unintended effects of managerial action", *Journal of Business Research*, Vol. 52, pp. 69-82.

Michalek, J., Finberg, F.M. and Papalambros, P.Y. (2005), "Linking marketing and engineering product design decisions via analytical target cascading", *Journal of Product Innovation Management*, Vol. 22, No. 1, pp. 42-62.

Miles, R. and Snow, C. (1978), *Organizational Strategy, Structure, and Process*, McGraw-Hill, New York.

Mukhopadhyay, S.K. and Gupta, A.V. (1998), "Interfaces for resolving marketing, manufacturing and design conflicts- A conceptual framework", *European Journal of Marketing*, Vol.32, No.1/2, pp.101-124.

Nakata, C. (1996), "National culture and new product development", *Journal of Marketing*, Vol. 40, No. 1, pp. 61-72.

Nonaka, I. and Takeuchi, H. (1995), *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press, New York.

Nussbaum, B. (2003), "Winners: the best product designs of the year", *Business Week*, 7 July, pp. 68-76.

Olson, E.M., Walker, O.C. Jr, Ruekert, R. and Bonner, J.M. (2001), "Patterns of cooperation during new product development among marketing, operations, and R&D: implications for project performance", *Journal of Product Innovation Management*, Vol. 18, pp. 258-71.

Parker, G.M. (1994), *Cross-functional Teams: Working with Allies, Enemies, and Other Strangers*, Jossey-Bass Publishers, San Francisco, CA.

Peters, A.J., Rooney, E.M., Rogerson, J.H., McQuater, R.E., Spring, M. and Dale, B.G. (1999), "New product design and development: a generic model", *The TQM Magazine*, Vol.11, No.3, pp.172-179.

Prahalad, C.K. and Hamel, C. (1990), "The core competence of the corporation", *Harvard Business Review*, May-June, pp. 79-91.

Rein, G.L. (2004), "From experience: creating synergy between marketing and research and development", *Journal of Product Innovation Management*, Vol. 21, No. 1, pp. 33-43.

Rosenthal, S.R. (1992), "Effective product design and development – how to cut lead time and increase customer satisfaction", *Business one Irwin*, pp.21-30.

Shapiro, B.P. (1977), "Can marketing and manufacturing coexist?" *Harvard Business Review*, Vol. 55, No. 5, pp. 104-114.

Simon, H.A. (1991), "Bounded rationality and organizational learning", *Organization Science*, Vol.2, pp.125-134.

Song, M.X., Neeley, S.M. and Zhao, Y. (1996), "Managing R&D-marketing integration in the new product development process", *Industrial Marketing Management*, Vol. 25, pp. 545-53.

Song, M.X., Xie, J.H. and Dyer, B. (2000), "Antecedents and consequences of marketing managers' conflict-handling behaviors", *Journal of Marketing*, Vol. 64, pp. 55-66.

Sun, H. and Wing, W.C. (2005), "Critical success factors for new Product development in the Hong Kong toy industry", *Technovation*, Vol.25, pp.293-303.

Takeuchi, H. and Nonaka, I. (1986), "The new product development game", *Harvard Business Review*, Vol. 64, No. 1, January-February, pp. 137-46.

Ulrich, K.T. and Eppinger, S.D. (1995), *Product Design and Development*, McGraw-Hill, New York, NY.

Urban, G. and Hauser, J. (1993), *Design and Marketing of New Products*, Prentice-Hall, Englewood Cliffs, NJ.

Van de Ven, A.H., Delbecq, A.L. and Koenig, R. (1976), "Determinants of coordination modes within organizations", *American Sociological Review*, Vol.41, pp.322-338.

Veryzer, R.W. (2005), "The roles of marketing and industrial design in discontinuous new product development", *Journal of Product Innovation Management*, Vol. 22, No. 1, pp. 22-41.

Wind, Y. (1981), "Marketing oriented strategic planning models", in Schultz, R.L. and Zoltners, A.A. (Eds), *Production and Inventory Handbook*, North-Holland, New York, NY.

Wruck, K.H. and Jensen, M.C. (1994), "Science, specific knowledge, and total quality management", *Journal of Accounting and Economics*, Vol.18, pp.247-287.