

Integration And New Product Development Success: The Role Of Formal And Informal Controls

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Abstract

The authors test a model that suggests that new product success is a function of the relational norms and integration between marketing and R&D. Integration and norms are influenced by formal controls such as centralization and formalization. The findings from a survey of 152 product managers demonstrate the importance of promoting collaborative relationships between R&D and marketing. The study found positive relationships between collaborative relationships and the creation of successful new products. The study also found that such relationships can be fostered by decentralizing decision making and clarifying the roles of new product development personnel.

Introduction

The successful development of new products continues to be a critical business activity as companies, both large and small, strive to maintain or acquire competitive advantage. In 1997 alone, 25,261 new products were launched (Fellman 1998). That comes out to be almost 486 products launched per week or 69-plus each and every day. In 1998, investment in R&D in the United States climbed to \$221 billion. In 1999, total R&D investment is expected to increase an additional 6-plus percent to \$236 billion (Studt and Duga 1999). In industry after industry, countless thousands of individuals make their living

producing and marketing new products. In short, new product development is not only a big business, it is a requisite for business survival.

Unfortunately, successful new product development remains difficult, especially for innovative and truly new products. Externally, companies face an increasingly hostile environment characterized by shortening product life cycles, capital shortages, government restrictions, fragmented markets, intensifying global competition, and rapid technological change. More daunting is the process of even getting a product to the stage where it can be commercially launched. Indeed, the magic in new product development efforts lies not in an organization's ability to generate new product ideas for they truly are a dime a dozen; but, rather in an organization's

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ability to nurture and manage the product development process (Sheridan 1998). The management of the new product development process determines a company's success in introducing new products, which, in turn, determines the firm's competitiveness in the global marketplace (Jenkins, Forbes, Durrani, and Banerjee 1997).

A good portion of the difficulty in managing the new product development process can be directly attributed to the multi-functional nature of the process. The new product development process encompasses a series of activities which, depending on type and duration, are usually led by different departments or teams, each with disparate structures, skills, cultures, people and resources. Contrary to the beliefs of many, successful new product development efforts usually are not as dependent on the prowess of any one department such as the engineering, R&D, or marketing functions, as they are on the ability of management to call on and successfully coordinate and integrate the efforts of many functions within the company including engineering, marketing, manufacturing, maintenance, and purchasing (Sinclair 1998). Thus, due to the complexities associated with having people from differing functions work together, development of new products is not programmable. Rather, it is inherently complex, iterative, and difficult to define and execute. It is for this reason that, in many cases, team members are chosen not only for their expertise and availability, but also for their personality and communication skills.

The purpose of the current study is to test a model of new product development organization. The model focuses on organizational control mechanisms (both formal and informal) which shape interactions between functional areas involved in new product development activities. The contention tested by this model is that the proper blend of organizational controls will enhance the likelihood of new product success. A main emphasis of the current study lies in evaluating the importance of both quality and quantity/frequency facets of cross-functional relationships versus the sole evaluation of frequency

facets. Due to the exploratory nature of the research, the current study focuses exclusively on the relationships between marketing and R&D personnel although the implications of the findings may be applicable across all functions.

The study contains six parts. First, relevant literature focusing on organizational control mechanisms, R&D and marketing integration, and new product success is reviewed. Second, hypotheses are developed which comprise a model of organizational control of R&D and marketing integration. Third, the methodology of the current study is presented. Fourth results of the empirical study involving R&D and marketing personnel are discussed. Fifth, implications and conclusions are drawn as to how the results of the current study can affect efforts to improve the new product development process. Sixth, suggestions for future research are given.

Literature Review

R&D and Marketing Integration and New Product Success

Substantial research has been devoted to uncovering the antecedents to new product success. This research has yielded a host of factors which influence the likelihood that a new product will achieve the objectives set for it. These factors can be divided into three categories; environmental factors (e.g. competitive intensity, market growth rates, etc.), product-specific factors (e.g. differentiation, performance-to-cost ratios, etc.) and organizational factors (e.g. organizational structure, senior management commitment, the use of cross-functional teams, etc.). While both environmental and product-specific factors play important roles in influencing new product success, organizational factors such as senior management commitment and organizational processes and structure that support new product development efforts remain dominant (Lester 1998; Barclay and Benson 1990). For example, product differentiation is the result of proper new product development organization. Likewise, proper organizational processes for examining

the environment can steer new product development efforts towards receptive markets and away from hostile ones.

Key among the organizational factors that have received considerable attention, both in the academic and general business press, is the notion of functional integration. The new product development process requires the integration (to some degree) of all business functions. The marketing function, in and of itself, does not dominate successful new product development efforts, nor does R&D, Operations, Logistics, Finance, or any other function. Successful new product development efforts require a balanced, cross-functional approach. If one function in the organization gains an upper hand, eventually, if not sooner, something will go wrong (Ettlie 1997).

While acknowledging the importance of integration across all functions, most research to-date has focused on the nature of integration efforts between marketing and R&D as this linkage represents the cornerstone of cross-functional efforts. To put it briefly, integration between R&D and marketing is necessary to ensure that market realities are included in technological development. Expertise in either R&D or marketing taken singularly, or even coexisting in the same organization, will not necessarily translate into product success. As a result, the building of cross-functional teams to forge a strong linkage between R&D and marketing is crucial (Gupta and Wilemon 1996).

Effective integration between R&D and marketing continues to be empirically linked to new product success (Griffen and Hauser 1996). Unfortunately, it cannot be taken for granted that a high degree of R&D and marketing integration exists in most organizations. Because the R&D and marketing functions are often structurally different, the personnel in each lack common frames of reference. In fact, R&D and marketing are typically characterized by strongly contrasting organizational subcultures with different values, conflicting motivations and goals, differ-

ing status structures and reward systems and differing concepts of procedure and control (Hendry 1989). Thus, the dilemma faced by management is clear. Effective integration between R&D and marketing is a key determinant of new product success; however, such integration is not easily achieved.

Structuring the Organization for Successful R&D and Marketing Integration

Several researchers (Jaworski, Stathakopoulos, and Krishnan 1993; Ouchi 1979) have argued that individuals in organizations are simultaneously subject to various controlling influences in carrying out their duties. Further, the use of such various controlling influences may improve the new product development process (Bart 1994). These controlling influences include formal controls and informal controls. Formal controls are written, management initiated mechanisms which influence the probability that employees or groups will behave in ways that support the stated objectives of the organization (Jaworski 1988). Such formal controls include organizational structure elements such as decision making rules, clear-cut statements of expectations, and explicit reward structures and evaluation criteria (Song, Montoya-Weiss, and Schmidt 1997)

In contrast to formal controls, informal controls are typically unwritten, worker initiated mechanisms that influence the behavior of organizational members (Jaworski 1988). An example of an informal control would be the norms or standards for behavior generated within a work group.

The power of the control combination concept lies in the recognition that organizations employ a wide range of formal and informal controls to manage themselves (Vagneur 1996). As a result, individuals themselves in organizations are subject to multiple control mechanisms simultaneously. Accordingly, to uncover the effects of organizational control on organizational outcomes, one must investigate both the formal

and informal controls most likely to be in operation. What follows is a model of how formal and informal controls affect both the integration between R&D and marketing and new product development success.

Model and Hypotheses Development

The model depicted in Figure 1 has the following rationale. Actions taken by management (formal controls such as centralization and formalization) impact the relationships formed and enacted by new product development personnel (integration and informal controls such as relational norms) which ultimately affect the success/failure of products developed by said personnel. This model explicitly links managerial control actions to new product development outcomes. Additionally, it demonstrates the mechanisms through which managerial controls affect new product development success.

Hypotheses 1-2: Linking Formal Controls to Informal Controls

The first set of hypotheses concerns the effect of formal control mechanisms (centralization and formalization) on informal control mechanisms (relational norms). Relational norms tend to develop over time as parties to a relationship interact. Such norms are characterized by solidarity and trust. Accordingly, centralized organizational structures are thought to: 1) limit the involvement of parties in decision making; 2) not communicate the value of cooperation and mutual trust (cf. Dwyer and Oh 1987); and 3) enhance dysfunctional conflict (Menon, Bharadwaj, and Howell 1996). Thus, centralized structures are unlikely to encourage the development of relational norms.

Conversely, formalization may actually encourage the development of relational norms. Formalization has been shown to clarify roles (cf. Organ and Greene 1981) and ensure that individuals and teams do not pursue random or superfluous opportunities that are inconsistent with the organization's strategic direction (Caruana,

Morris, and Vella 1998). When R&D and marketing personnel understand their roles and live up to them, they are likely to develop reputations for trustworthiness. Formalization should illuminate for R&D and marketing personnel who is responsible for what in the new product development process. This clarification of responsibilities should lead to an appreciation of the inter-dependencies between R&D and marketing. When R&D and marketing personnel recognize their mutual dependencies and develop reputations for role performance; mutual respect and commitment to the relationship should result. Thus, the following hypotheses can be tested:

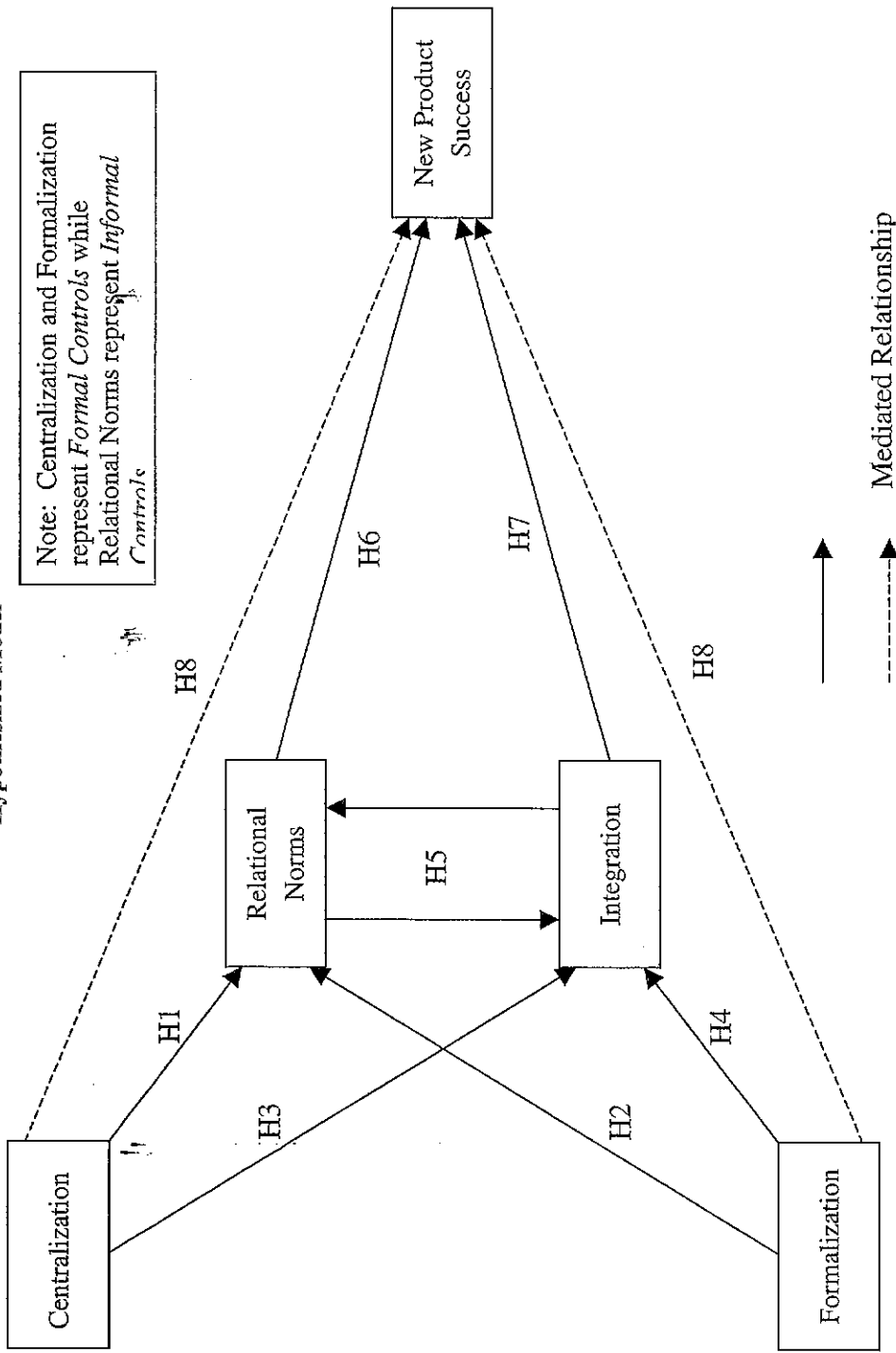
H1: Centralized decision making impedes the development of relational norms between R&D and marketing personnel involved in new product development.

H2: Formalization of roles and responsibilities enhances the development of relational norms between R&D and marketing personnel involved in new product development.

Hypotheses 3-4: Linking Formal Controls to Integration between R&D and Marketing

The second set of hypotheses relates to the impact of formal controls (centralization and formalization) on the amount of interaction (integration) between R&D and marketing personnel on a given new product development project. While relational norms reflect the nature or climate of the relationship between R&D and marketing personnel, integration reflects the actual amount of interaction between these two parties on specific new product development tasks. It has been empirically shown that formal control mechanisms can either encourage or discourage interaction between parties (cf. Gupta et al 1985). When decision making is centralized, communication tends to be vertical. However, functional integration requires considerable horizontal communication (cf. Galbraith 1973). Thus, it is expected that centralized decision making would deter integration between R&D and marketing.

Figure 1
Hypothesized Model



As described earlier, formalization clarifies the roles of R&D and marketing personnel and thus, highlights the dependencies between them. Further, formalization has been shown to increase the amount of communication between R&D and marketing (Moenaert, Souder, Meyer, and Deschoolmeester 1994) As a result, formalization should lead to increased integration between the two functions. The above stated relationships can be verified by testing the following two hypotheses:

H3: Centralized decision making deters integration between R&D and marketing personnel involved in new product development.

H4: Formalization of roles encourages integration between R&D and marketing personnel involved in new product development.

Hypothesis 5: Informal Controls and Integration between R&D and Marketing Personnel

As described above, both relational norms and integration are characteristics of a relationship. The norms describe the climate of the relationship and represent the underlying rules for engagement of the relationship. Integration on the other hand, describes the amount of interaction between parties to a relationship. While these two variables are similar they are distinct. For example, as members of a cross-functional team, R&D and marketing personnel may interact frequently in the course of completing a new product development project. However, frequent meetings and interaction alone does not guarantee that participants will abandon narrow, compartmentalized views or attitudes and view the relationship between groups as one characterized by trust and solidarity (Jassawalla and Sashittal 1996).

Relational norms result in mutual expectations of concern for the well being of the relationship and in cooperative behavior (cf. MacNeil 1980). When a relationship is characterized by relational norms, parties to the relationship take action to promote the well being of

the relationship. For example, marketing may actively involve R&D personnel in visits to customer sites. In essence, effective relationships develop because R&D and marketing personnel are aware that they must work together to achieve their goals (cf. Gupta et al. 1985). Thus, the presence of relational norms should result in increased integration between R&D and marketing. Conversely, it has been demonstrated that relational norms develop over time through repeated interactions (Bettenhausen and Murnighan 1985). In sum, the presence of relational norms leads to increased interaction and increased interaction may lead to the development of relational norms. The following hypothesis represents the likely reciprocal relationship existing between relational norms and integration.

H5: Relational norms and integration between R&D and marketing personnel involved in new product development are positively related.

Hypotheses 6-7: Informal Controls, R&D and Marketing Integration and New Product Success

R&D and marketing interactions characterized by relational norms should enhance the likelihood of new product success. Souder (1988) found that R&D and marketing relationships characterized as "harmonious" were closely linked to new product success. The relationships he described as harmonious exhibited the presence of relational norms. When both R&D and marketing personnel are committed to the relationship, they are likely to take actions which benefit the mutual goals of the relationship. Thus, they are likely to put the goals (including creating successful new products) of the relationship ahead of other goals (e.g. meeting departmental commitments, individual recognition, etc.).

The amount of interaction between R&D and marketing continues to be empirically linked to new product success (Strieter and Tankersley 1998; Song and Perry 1997; Gupta et al. 1985;

Souder and Chakrabarti 1978). Each party to the relationship (R&D and marketing) possesses critical skills and information that must be joined to develop successful new products. Accordingly, the more integrated these parties become, the more likely that the necessary blending of skills and information will occur. The following hypotheses demonstrate the impact of relational norms and integration on new product success.

H6: Relational norms between R&D and marketing personnel involved in new product development enhance the likelihood of new product success.

H7: Integration between R&D and marketing personnel involved in new product development enhances the likelihood of new product success.

Hypothesis 8: Formal Controls and New Product Success

The final hypothesis concerns the relationship between formal controls and new product success. The effects of centralization and formalization on various organizational outcomes has been investigated extensively over the last thirty years. While these variables have been strongly linked to perceptual measures of individual and organizational outcomes (e.g. satisfaction, perceived effectiveness, organizational commitment, etc.), their success at explaining more objective measures of outcomes (e.g. profit, sales, etc.) has been limited. It is proposed that formal controls do have an impact on organizational outcomes of interest but in an indirect manner. More specifically, it is proposed that centralization and formalization impact new product success through their impact on informal controls and integration. Thus, the latter two variables mediate the effect of formal controls on new product success.

H8: The effects of centralization and formalization on new product success are mediated by the levels of relational norms and integration existing between R&D and marketing per-

sonnel involved in new product development.

Method

The authors tested the model's hypotheses using a survey instrument created based upon previous work in the areas of new product development and organizational theory. The sample was drawn from the members of a national association of product development managers. This sampling frame would solicit responses from managers who were deeply involved in the new product development process. Of the 837 deliverable surveys, 152 usable responses were obtained for an effective response rate of 18.2%. Although response rates of less than 30% are common when sampling business practitioners (McDaniel and Burnett 1990; Akaah and Riordan 1990; Hunt, Chonko, and Wilcox 1984), there is a chance of a significant non-response bias. In this study, one primary non-response concern would be that unsuccessful new product projects would be underrepresented.

Each respondent was asked to answer questions with respect to the most recent new product development project with which they had been involved and which had been commercially launched. This way, respondents were able to evaluate and comment knowledgeably on the commercial success of the product. Respondents answered questions related to the success of the project, as well as to the levels of centralization, formalization, relational norms, and integration existing in the new product development process. Each of the scales developed for this study was reliable (see Table 1).

The scale for centralization was comprised of five seven-point Likert-type items that were adapted from Gupta, Raj, and Wilemon's (1986) study. Formalization, which represents the extent to which management explicitly states a person's role responsibilities, was measured on a three-item, seven-point Likert-type scale that was adapted from John and Martin's (1984) study.

Table 1
Scale Reliability Analysis

| <u>Scale (Variable)Name</u> | <u>Number of Items</u> | <u>Coefficient Alpha</u> |
|-----------------------------|------------------------|--------------------------|
| Centralization | 5 | .8474 |
| Formalization | 3 | .9256 |
| Relational Norms | 9 | .8861 |
| Integration | 10 | .8229 |
| Success | 3 | .8817 |

Integration, defined as the extent of information sharing and involvement across functional areas, was measured using ten, seven-point Likert-type items adapted from Gupta, Raj, and Wilemon's (1985) study. The ten items can be broken into three categories: marketing's involvement with engineering in front-end new product development activities, the extent of information provided by marketing to engineering with regard to new product development activities, and engineering's involvement with marketing in various new product development activities. These categories represent specific integration factors that together represent integration between R&D and marketing.

Relational norms refer to the extent to which people seek to maintain and enhance interpersonal relationships. It is a second-order construct that is manifest in norms of solidarity, flexibility, and conflict harmonization (Macneil 1980). These norms approximate the harmonious R&D and marketing relationship described by Souder (1988). Nine seven-point Likert-type items were constructed on the basis of the scale developed by Heide and John (1992).

Success was defined as the extent to which the project met its business goals. Three seven-point Likert-type items were used to measure new product success in terms of sales objectives, profit objectives and overall commercial objectives.

Discussion of Results

Path analysis was utilized to test the model depicted in Figure 1. A total of three structural equations were estimated to test the hypotheses (one for each of the endogenous variables). Fig-

ure 2 shows the model with all paths estimated (standardized partial regression coefficients are reported). Figure 3 shows the trimmed model with significant paths only.

Formal Controls and Informal Controls

The first structural equation examined the link between formal controls (centralization and formalization) and informal controls (relational norms). As hypothesized (H1), increasing levels of centralization impeded the development of relational norms ($\beta = -.186$; $\text{sig.} = .016$). Concentrating decision making authority in the hands of a limited number of people does not foster a sense of cooperation and shared destiny. The hypothesized relationship between formalization and relational norms did not materialize. Increasing levels of formalization were not associated with higher levels of relational norms ($\beta = .099$; $\text{sig.} = .205$). Accordingly, H2 is not supported. The structural equation was respecified, dropping the insignificant path between formalization and relational norms. This resulted in a strengthening of the exhibited relationship between centralization and relational norms ($\beta = -.318$; $\text{sig.} = .007$) (See Table 2).

Formal Controls and Integration

The second structural equation examined the link between formal controls (centralization and formalization) and integration between R&D and marketing. Increasing levels of centralization did not result in lower levels of integration between R&D and marketing as hypothesized ($\beta = -.055$; $\text{sig.} = .492$). Thus, H3 is not supported. There is partial support for the relationship between formalization and integration between R&D and marketing ($\beta = .145$; $\text{sig.} = .066$). Thus, there

Figure 2
 Path Estimates (Betas)
 (All paths estimated)

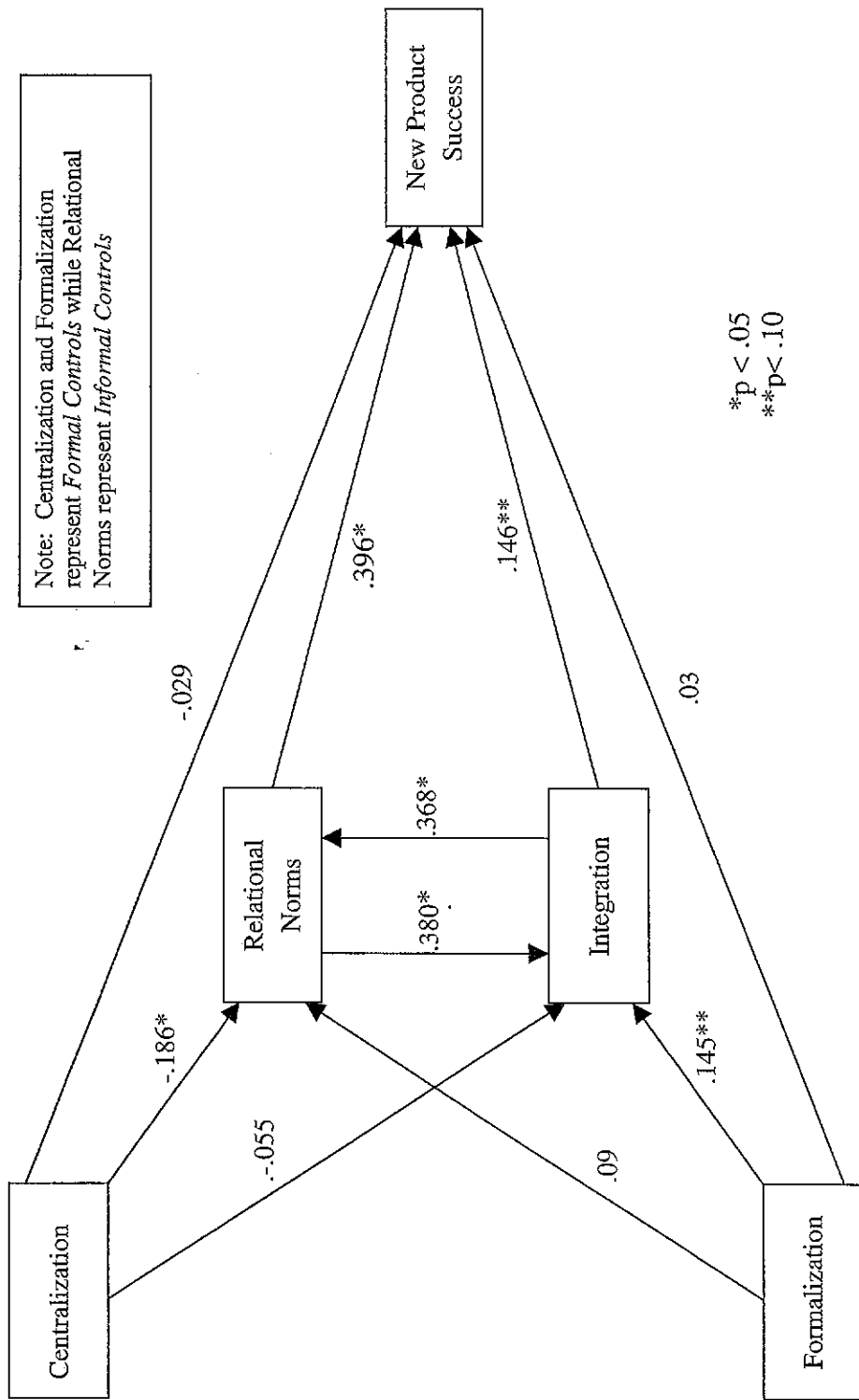


Table 2
Results From Path Analysis With All Paths Estimated

| <u>Predictor Variable</u> | <u>Path Estimated</u> | <u>Dependent Variable</u> | <u>Beta</u> | <u>Significance</u> |
|---------------------------|-----------------------|---------------------------|-------------|---------------------|
| centralization | | relational norms | -.186 | .016* |
| formalization | | relational norms | .099 | .205 |
| integration | | relational norms | .386 | .000* |
| centralization | | Integration | -.055 | .492 |
| formalization | | Integration | .145 | .066** |
| relational norms | | Integration | .380 | .000* |
| centralization | | new product success | -.029 | .710 |
| formalization | | new product success | .037 | .635 |
| relational norms | | new product success | .396 | .000* |
| integration | | new product success | .146 | .080** |

* p < .05
** p < .10

is some evidence that clarification of roles enhances integration between R&D and marketing. While the relationship is in the predicted direction, it falls just short of the .05 level of significance. The structural equation was respecified, dropping the insignificant path between centralization and integration. The respecified model showed very little change in the relationship between formalization and integration (beta = .137; sig. = .076).

Informal Controls and Integration

Hypothesis 5 predicted that the relationship between relational norms and integration between R&D and marketing is positive and non-recursive. As the level of relational norms increases(decreases), so too should the amount of integration between R&D and vice versa. To test this hypothesis, the structural equation described previously with relational norms as the dependent variable included integration as a predictor variable. The relationship was significant (beta = .386; sig. = .000). Likewise, the structural equation with integration as the dependent variable included relational norms as a predictor variable. This relationship was also significant (beta = .380; sig. = .000). Accordingly, H5 is supported. The more strongly group members felt the tie to the relationship, the more frequently they inter-

acted. Additionally, more frequent interaction illuminated common bonds and built solidarity. As mentioned above, each of these structural equations was trimmed to reflect only significant paths. The result was a slight increase in strength in each of the paths between relational norms and integration (see Figure 3).

Formal Controls, Informal Controls, Integration and New Product Success

The final structural equation examines the relationships between formal controls (centralization and formalization) and new product success, informal controls (relational norms) and new product success (H6) and integration between R&D and marketing and new product success (H7). Hypothesis 6 posits that increasing levels of relational norms will lead to new product success. This hypothesis is supported (beta = .396; sig. = .000). Thus, projects for which the participants felt a greater sense of commitment to the group and its outcomes experienced higher levels of success.

The relationship between integration and new product success is not as strong (beta = .146; sig. = .08). The direction is as hypothesized but the relationship fails to reach the commonly accepted significance standard of .05. This finding is con-

Figure 3
 Path Estimates (Betas)
 (Trimmed Model)

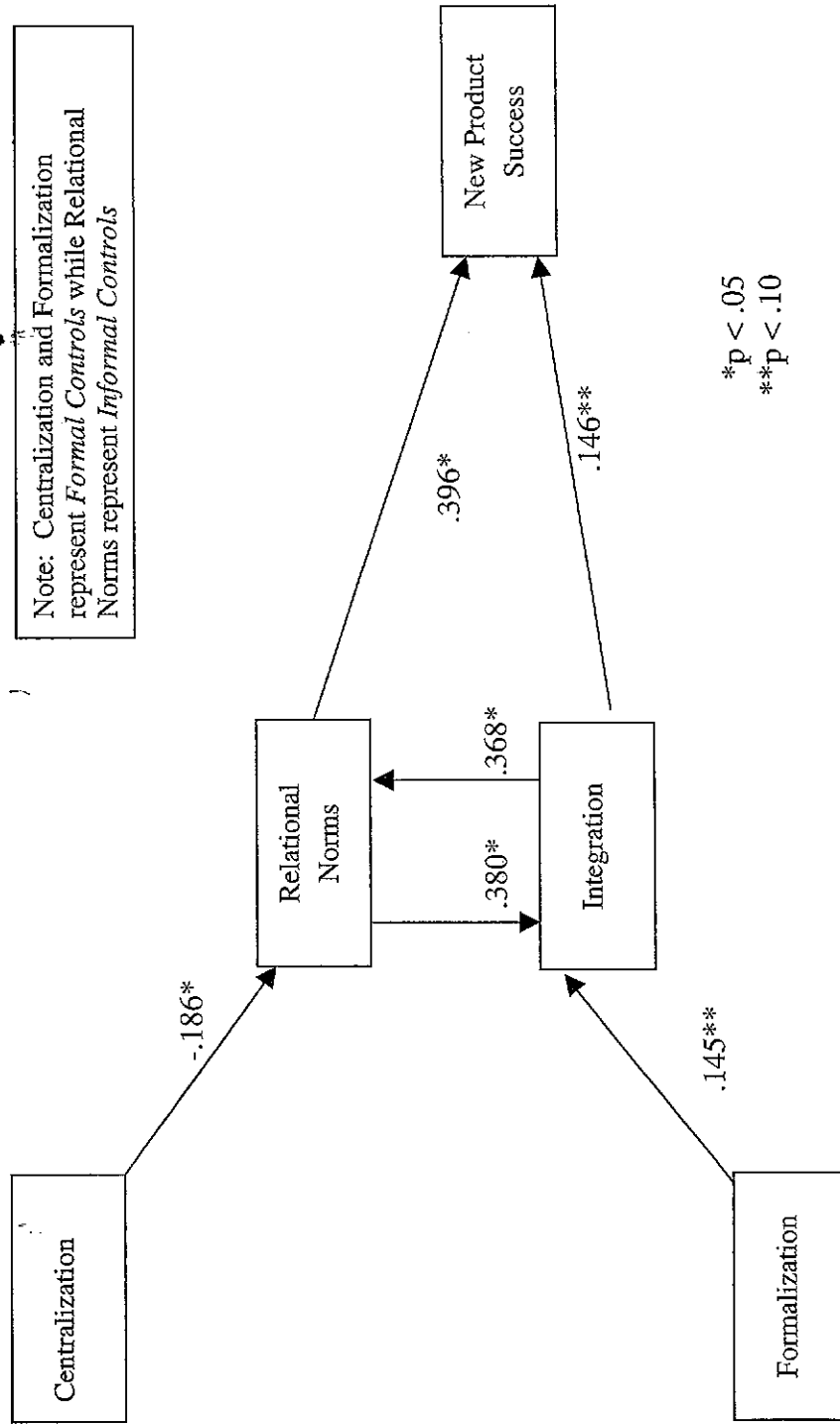


Table 3
Trimmed Path Model

| <u>Path Estimated</u> | | <u>Beta</u> | <u>Significance</u> |
|---------------------------|---------------------------|-------------|---------------------|
| <u>Predictor Variable</u> | <u>Dependent Variable</u> | | |
| centralization | relational norms | -.205 | .007* |
| integration | relational norms | .394 | .000* |
| formalization | Integration | .137 | .076** |
| relational norms | Integration | .401 | .000* |
| relational norms | new product success | .419 | .000* |
| integration | new product success | .160 | .047* |

* p < .05

** p < .10

sistent with recent work by Kahn (1996) which demonstrates that interaction between R&D and marketing (similarly defined to integration in this study) had a smaller impact on new product success than did collaboration between R&D and marketing (similarly defined to relational norms in this study).

Centralization does not directly impact new product success (beta = -.029; sig. = .710) nor does formalization (beta = .037; sig. .635). Accordingly, the structural equation was respecified omitting the non-significant paths between formal controls (centralization and formalization) and new product success (see Table 3). The strength of the relationship between relational norms and new product success increased slightly (beta = .419; sig. = .000). Also, the strength of the relationship between integration and new product success increased enough to reach significance at the .05 level (beta = .160; sig. = .047). Thus, both H6 and H7 are supported.

The last hypothesis (H8) posits that the impact of formal controls (centralization and formalization) on new product success is mediated through their impact on informal controls (relational norms) and integration between R&D and marketing. As stated above, there are no significant direct effects between formal controls (centralization and formalization) and new product success. However, formal controls (centralization and formalization) do impact informal controls (relational norms) and integration between R&D and marketing which in turn impact new product success. To test H8, the direct, indirect and total

effects of formal controls (centralization and formalization) on new product success were examined (see Table 4). In order for a mediating effect to exist, three conditions must be met (Barron and Kenny 1986). First, variations in the independent variables (centralization and formalization) must account for variations in the mediating variables. As discussed above, centralization impedes the development of relational norms and formalization increases (sig. = .076) the level of integration between R&D and marketing. Thus, the first condition is partially met.

The second condition for mediation is the presence of significant relationships between the mediating variables and the dependent variable. Both informal controls (relational norms) and integration between R&D and marketing are significantly related to new product success. Thus, the second condition for mediation is met.

Finally, the last condition for mediation calls for the disappearance of, or a significant reduction in a previously significant relationship between the independent variables (centralization and formalization) and the dependent variable (new product success) when controlling for the mediating variables (informal controls (relational norms) and integration). The total effects reported in Table 4 show the relationships between formal controls (centralization and formalization) and new product success when controlling for informal controls (relational norms) and integration between R&D and marketing. While the relationships are not significant at the .05 level (centralization and new product success: beta = -.137; sig.

Table 4
Results from Test of Mediation

| <u>Predictor</u> | <u>Dependent</u> | <u>Direct Effects</u> <u>Beta (sig.)</u> | <u>Indirect Effects</u> <u>Beta</u> | <u>Total Effects</u> <u>Beta (sig.)</u> |
|------------------|---------------------|---|--|--|
| centralization | new product success | -.029(.710) | -.108 | -.137(.103) |
| formalization | new product success | .037(.635) | .116 | .153(.069) |

Table 5
Hypotheses Results

| | | |
|----|--|----------------------|
| H1 | Centralization impedes development of relational norms | Supported |
| H2 | Formalization promotes development of relational norms | Not Supported |
| H3 | Centralization discourages integration between R&D and marketing | Not Supported |
| H4 | Formalization promotes integration between R&D and marketing | Partially Supported* |
| H5 | Relational norms are positively related to integration between R&D and marketing | Supported |
| H6 | Relational norms promote new product success | Supported |
| H7 | Integration between R&D and marketing promote new product success | Supported |
| H8 | The relationship between formal controls and new product success is mediated by relational norms and integration between R&D and marketing | Partially Supported |

* p < .10

= .103 and formalization and new product success: beta = .153; sig. = .067), they approach significance. Thus the third condition for mediation is partially met and accordingly H8 is partially supported. To summarize, there is some evidence that managerial efforts to improve new product success through changes to formal control mechanisms will only be successful if those changes have the necessary effect on informal controls (relational norms) and integration between R&D and marketing.

Managerial Implications and Conclusion

Table 5 summarizes the eight hypotheses tested and the results of this research. Based on these findings, several managerial implications are apparent. Organizations are continually trying to improve new product development processes and ultimately, the success rate associated with new product development activities. It is common knowledge that “effective integration” between key functional areas; namely, R&D and marketing, is crucial to new product development success. This study demonstrates that interaction between R&D and marketing and “effective integration” between the two functions are not the same. New product development success was

positively related to the presence and strength of relational norms. Such norms create a climate of interaction whereby individuals are willing to set aside individual goals in the interest of promoting group goals.

Thus, R&D personnel may be willing to actively seek marketing input during the product design phase since they (R&D) recognize the importance of such input in creating successful new products. Likewise, marketing personnel may actively include R&D in uncovering and defining customer needs. In both situations, the sense of mutual interdependence and common goals overrides the tendency to protect turf and to stick with one’s own kind. In short, “effective integration” of R&D and marketing encompasses not only interaction (or a high level of interaction) between R&D and marketing but; rather, it requires interaction characterized by the presence of relational norms. The climate of the interaction must be collaborative.

As seen by the results of the study, the amount of interaction between R&D and marketing had considerably less impact on new product success than did the presence and strength of relational norms. This finding supports earlier work

by Kahn (1996) which found that collaboration between R&D and marketing (defined as the presence of collective goals, mutual understanding and "Esprit de Corps") had a strong impact on new product development success while interaction between R&D and marketing had no significant relationship to new product development success.

So, what lesson can managers draw from the results of the current study? Foremost, efforts to increase R&D and marketing interaction may only meet with limited success if said interaction does not create a stronger relational bond between these two parties. In other words, it is important to recognize that frequency (quantity) of interactions is not equivalent to quality of interactions. Thus, managerial actions such as formalizing integration through: 1) holding mandatory weekly meetings; 2) creating cross-functional new product development committees; 3) implementing information exchange programs such as e-mail, GroupWare, etc.; or 4) even physically relocating R&D and marketing so that they are in closer proximity may be ineffective if all these actions accomplish is to increase the frequency of interaction.

What is needed is for these activities to enhance the level of relational norms existing among the new product development process personnel. Unfortunately, management too often sees efforts to increase interaction as the only-needed fix to R&D and marketing problems. Yet, if the relationship between R&D and marketing is dysfunctional or even hostile, increased and forced interaction is not likely to be the appropriate cure. Relational norms are developed over time and thus, management quick fixes are likely to have, at best, limited success in generating the desired collaboration between R&D and marketing, particularly in the short-term.

How then can managers foster the development of relational norms in R&D and marketing relationships? This is where the power of the control combination concept is demonstrated. The findings of this study indicate that changes in the organizational structure of new product development efforts can enhance or impede the emer-

gence and growth of relational norms. By decentralizing decision making early on in a new product development project, management can create an atmosphere which requires and encourages participative decision making. In other words, management vests the new product development personnel (most notably R&D and marketing) with the decision making authority to match the responsibility they hold for successfully completing the new product development project. As a result, new product development personnel are charged with controlling their own destiny. Such responsibility should illustrate the importance of collaboration and mutual interdependence.

Along with dispersing decision making among the new product development personnel, management should clarify the roles and responsibilities of new product development personnel. Past research has found a positive link between formalization of roles and effective R&D and marketing integration (Ayers, Dahlstrom, and Skinner 1997; Saghafi, Gupta and Sheth 1990, Souder 1988). This formalization of roles demonstrates the interdependencies between R&D and marketing. When marketing and R&D understand (as individual functions) the crucial role that R&D/marketing (as a combined group) plays in developing successful new products, they (the individuals within and the individual functions) are more likely to share common goals with R&D/marketing (as a combined group). Thus, greater understanding of the critical role that all parties play illustrates the importance of collaboration.

A note of caution regarding the closeness of relationships is also warranted. It is possible for relationships between R&D and marketing to become so close that the relationship becomes dysfunctional. Some researchers (Ayers, Dahlstrom, and Skinner 1997; Souder 1988) have found that in certain cases, the relationship between R&D and marketing is so close that new product development efforts are hampered. For example, when the relationship between R&D and marketing becomes too close, individual parties to the relationship may hesitate to point out problems to superiors. Souder (1988) refers to this situation as a "too good friends syndrome." Too much confor-

mity to group norms may inhibit the conflict, debate and disagreement necessary for innovation. As evidence of the existence of this problem, during a recent conference on innovations in new product development, a manager for a large consumer goods manufacturer made the following statement: "We don't want our marketing and R&D people to be friends."

Suggestions for Future Research

One goal of the new product development process is to create a R&D and marketing relationship characterized by mutual respect and common goals. However, the relationships between R&D and marketing can become so close that the original end goal of the relationship, successful new product development processes, can become compromised. Future research needs to be conducted to determine the best means by which (and to what degree) collaborative and close relationships can be forged between functions such as R&D and marketing, while at the same time, still optimizing new product development. □□

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