

The Effects Of Organisational Structure, Interpersonal Trust And Communication During New Product Development Projects

Elias Kyriazis, University of Wollongong
Graham R. Massey, University of Technology, Sydney

Abstract

This study examines the antecedents of effective working relationships between Marketing and R&D managers during NPD projects. Adopting both a structural and individual-level perspective, we examine the impact on relationship effectiveness of formalisation, centralisation, communication frequency and bidirectionality, and interpersonal trust between Marketing Managers and R&D Managers during NPD product development projects. Our hypothesised model is tested using a sample of 184 product development projects conducted in Australia, and our findings reveal two dimensions of interpersonal trust (cognition- and affect-based trust) are potent factors driving effectiveness during product development projects. We also reveal differential effects of the two communication behaviours, and demonstrate that unlike bidirectional communication, communication frequency does not increase relationship effectiveness. Similarly, whilst formalisation can help improve relationship effectiveness on product development projects, centralisation does not have any positive effect.

Key words: Interpersonal trust; Cross-functional relationships; Marketing/R&D integration; new product development.

Introduction

Converting abstract ideas into tangible products during product development involves interdependent specialists providing or exchanging resources such as information, expertise, and money (Lawrence and Lorsch 1967; Olson, Walker, and Ruekert 1995). Effective cross-functional relationships are therefore important because they facilitate these exchanges. The focus of this study is on Marketing/R&D relationships, because they are among the most critical during new product development (Wind 1982; Souder 1987). The issue is not trivial because there is strong evidence that the better these two functions are integrated, the greater the likelihood of successful new product outcomes (cf. Griffin and Hauser 1996; Maidique and Zirger 1984; Maltz, Souder, and Kumar 2001; Souder 1981, 1988). Empirical evidence suggests however, that Marketing/R&D relationships during product development are often poor (Shaw and Shaw 1998), therefore improving these relationships is a critical managerial challenge.

A wide range of factors can affect Marketing/R&D relationships, including organisational structure, e.g., centralisation and formalisation (Burns and Stalker 1961; Lawrence and Lorsch 1967), managers' communication behaviours (Gupta, Raj, and Wilemon 1985; Souder 1981), and the level of trust between those managers (Souder, 1988; Jassawalla and Sashittal 1998). Accordingly, our study uses a sample of 184 product development projects to examine the role of these factors in Marketing/R&D relationships.

Theoretical Foundations

We draw on two theoretical foundations to develop our model, Weber's (1924/47) theory of bureaucracy, and the "interaction approach." The interaction approach focuses on understanding how constructs such as communication and trust predict satisfaction, performance, and relationship continuity in various contexts, e.g., buyer-seller and channel relationships (cf. Anderson and Narus 1990; Morgan and Hunt 1994; Moorman, Deshpandé, and Zaltman 1993), and cross-functional relationships (e.g., Ruekert and Walker 1987). From Weber (1947) we draw our two structural dimensions—formalisation and centralisation, because the management and marketing literature identify them as important aspects of internal coordination (e.g., Ayers, Dahlstrom, and Skinner 1997; Rajagopalan, Rasheed, and Datta 1993). They are therefore both likely to influence coordination and effectiveness in Marketing/R&D relationships. Our choice of theoretical frameworks allows us to examine Marketing/R&D relationships across a number of dimensions (e.g., interpersonal trust; communication), and levels of analysis (e.g., structural versus individual-level).

Conceptual Framework and Hypotheses

Our hypothesised model includes three groups of variables—structural, interaction, and trust, plus our outcome variable, perceived relationship effectiveness. We argue that Weber's structural/bureaucratic dimensions are likely to be important during innovation as product development projects involve people from different departments with distinct skills, resources, and capabilities, and a key managerial challenge is to coordinate the activities of these specialised yet interdependent actors. Formalisation and centralisation are two means by which this coordination is achieved. High levels of structure/bureaucracy during product development may be dysfunctional, because the resulting ossification of behaviour can lead to the rejection of innovative ideas (Mintzberg 1979). However, some structure is necessary during product development to help coordinate activities and information flows (Mintzberg 1979). Accordingly, our model specifies formalisation and centralisation to influence relationship effectiveness during product development. Similarly, communication is known to directly influence the effectiveness of various relationships (e.g., Ruekert and Walker 1987; Fisher, Maltz and Jaworski 1997), and we therefore link communication to our dependent variable, perceived relationship effectiveness. Also, many studies acknowledge the importance of interpersonal trust in driving effectiveness in peer manager relationships (e.g., McAllister 1995), hence its inclusion in our model. In the following section we discuss the dependent variable, our explanatory variables, and develop our hypotheses.

Dependent Variable: Perceived Relationship Effectiveness: Our dependent variable *perceived relationship effectiveness* is drawn from Van de Ven (1976), and relates to whether the R&D Manager perceives their relationship with the Marketing Manager to be worthwhile, equitable, productive and satisfying. Consistent with other studies (e.g., Ruekert and Walker 1987; Anderson and Narus 1990; Smith and Barclay 1997) we operationalise this construct at the interpersonal level rather than the interdepartmental level. Other studies have also used subjective outcome measures, and we feel justified doing so because there is good evidence that the effectiveness of

cross-functional relationships is strongly associated with successful product development outcomes (e.g., Souder 1981, 1988).

Structural/Bureaucratic Dimensions - Formalisation and Centralisation: Various studies have found that these two bureaucratic dimensions affect cross-functional relationships during product development projects (e.g., Gupta, Raj, and Wilemon 1986; Olson, Walker, and Ruckert 1995; Song, Neeley, and Zhao 1996, Ayers, Dhalstrom and Skinner 1997). Formalisation is defined as the emphasis placed on following rules and procedures when performing one's job (cf. Pugh et al. 1968). Formalisation reduces confusion because staff know what they are expected to do during product development and this helps coordinate effort, and facilitate productive exchanges between managers (Thompson 1967). Further, formalisation establishes managers' role expectations and expected information flows from their counterparts on product development projects (Moenaert and Souder 1990a). We therefore hypothesise:

H1_a: Greater project formalisation is positively related to relationship effectiveness

Centralisation is the extent to which decisions are made at higher levels in a firm's hierarchy (Aiken and Hage 1968). McCann and Galbraith (1981) argue that a key issue facing top management is to trade-off control against greater adaptability from decentralisation. Several studies in the NPD literature suggest that centralisation negatively affects functional behaviours such as information sharing, cross-functional communication and resource sharing between functional specialists. (e.g., Gupta and Wilemon 1988; Ruckert and Walker 1987, Ayers, Dhalstrom and Skinner 1997). If centralisation has negative effects on such functional behaviours, we would also expect it to be negatively associated with relationship effectiveness, and therefore hypothesise:

H1_b: Greater project centralisation is negatively related to relationship effectiveness

Communication Dimensions - Frequency and Bidirectionality: A key tenet of the interaction approach (e.g., Ruckert and Walker 1987; Souder 1988; Song, Xie, and Dyer 2000) is that effective relationships are built on a foundation of frequent communication. Frequent communication can promote mutual understanding, more harmonious relationships, and improve joint decision-making (cf. Griffin and Hauser 1996). Communication frequency is defined as the intensity of information flow between the Marketing Manager and the R&D Manager via various means, e.g., formal meetings, reports, and telephone conversations (Van de Ven and Ferry 1980). Fisher, Maltz, and Jaworski (1997) found a positive relationship between communication frequency and perceived relationship effectiveness. Consistent with this Song, Neeley, and Zhao (1996) found that R&D employees identified a lack of communication as a major barrier to effective relationships with marketing. Hence infrequent peer manager communication may indicate that the relationship is ineffective, and frequent communication should therefore be positively associated with relationship effectiveness. We therefore hypothesise:

H2_a: Greater communication frequency is positively related to relationship effectiveness

Bidirectional communication is also included in this study because recent studies have established its importance in cross-functional, and other exchange relationships (e.g., Fisher, Maltz, and Jaworski 1997; Mohr, Fisher, and Nevin 1996). Consistent with

previous studies (e.g., Fisher, Maltz, and Jaworski 1997), we define bidirectionality as the extent to which communication between our two focal managers is a two-way process. Souder (1987) argues that the sharing of project data and facts helps build creative synergy by allowing parties to agree on the division of labour, define their roles, and determine which tasks each is best able to perform. Moreover, others note that bidirectional communication is especially important during product development (e.g., Wheelwright and Clark 1992). Therefore we hypothesise:

H2_b: Greater bidirectional communication is positively related to relationship effectiveness

Interpersonal Trust Dimensions: The marketing channels literature identifies trust as an important contributor to effective buyer-seller relationships (e.g., Anderson and Weitz 1989). Similarly, in the relationship marketing literature, Morgan and Hunt (1994) identify trust as a key variable in effective relational exchange. Trust is also important in cross-functional relationships because managers are boundary spanners and need to develop horizontal ties within the organization (Gabarro 1990; McAllister 1995; Williams 2001). Interpersonal trust has been conceptualised in various ways, e.g.,—*credibility*, in which the trusted person fulfils oral or written statements or promises (e.g., Moorman, Zaltman, and Deshpandé 1992). Another perspective is that trust involves *benevolence*—a general concern for other people, and transcends the personal profit motive (e.g., Rempel, Holmes, and Zanna 1985). The perspective which we adopt in this paper is similar, that trust has two underlying dimensions: cognitive and affective (McAllister 1995). Cognition-based trust arises from previous occasions in which another person has been competent, reliable, and dependable, and is based on a rational assessment of others' past behaviour. In contrast, affect-based trust is an emotional form of trust, in which one party exhibits genuine care and concern for the welfare of the other person. Peer managers who trust each other are likely to assess each other's performance more favourably (McAllister 1995). We therefore hypothesise:

H3_a: Greater cognition-based trust is positively related to relationship effectiveness

H3_b: Greater affect-based trust is positively related to relationship effectiveness

Research Methodology and Measures

Sampling procedure: Data was collected from R&D Managers in Australian firms, acting as key informants on the relationship with their counterpart Marketing Manager. The survey used a pretested, mailed, self-administered questionnaire. This resulted in a 184 usable responses, a net response rate of 54%. The sample of 184 firms comprised mostly goods producers (96.2%), while the remainder (3.8%) were software producers. Consumer marketers accounted for 47.0%, business-to-business marketers 23.5%, and 29.5% sold into both markets.

Measurement and Analysis

Our measures included one formative measure—communication frequency, which was assessed using ten items, and six reflective multi-item measures, formalisation, centralisation, bidirectional communication, cognition-based trust, affect-based trust, and perceived relationship effectiveness. Our measures were found to be unidimensional, and discriminant validity was established. Reliability analysis reveals alpha coefficients for our measures of .79 or higher suggesting good internal consistency in our measures. Regression Analysis was used to test our model, and no

multicollinearity was detected. Further, our predictor variables explained 72.5% of the variance in our dependent variable.

Table 1: Determinants of Perceived Relationship Effectiveness

Construct	Hypoth. Sign	Standardized Coefficients	T-values
Formalisation	H1 _a (+)	.108	2.535*
Centralisation	H1 _b (-)	.035	.873
Comm. Frequency	H2 _a (+)	.021	.480
Bidirectional Comm.	H2 _b (+)	.238	4.391**
Cognition-based Trust	H3 _a (+)	.399	6.868**
Affect-based Trust	H3 _b (+)	.271	4.605**
R² = .734	Adj. R² = .725	F value = 81.549	Sig. level = .000

* $p < 0.05$ ** $p < 0.01$ One-tailed tests.

Contributions of the Study: Theoretical and Managerial Implications

As predicted, interpersonal trust is an important determinant of effective relationships. Both cognition- and affect-based trust have a strong positive impact on relationship effectiveness, with cognition-based trust having the stronger effect. Where Marketing Managers demonstrate their competence, the R&D Manager will be more likely to have cognition-based trust in them, and perceive their relationship to be effective. Similarly, if there is affect-based trust between these two managers, the R&D Manager will be more likely to perceive their relationship to be effective. Our findings therefore support the view that trust can help break down the barriers between “functional silos,” each with their own thought-worlds, language and jargon (Dougherty 1992). Our findings also provide insights into the role of communication behaviours, specifically, bidirectional communication has a strong positive association with relationship effectiveness, thus supporting the findings of Fisher, Maltz and Jaworski (1997). However, contrary to the interactionist viewpoint, frequent communication does not necessarily improve relationship effectiveness thus supporting the findings of Kahn (1996) that too much formalised communication may in fact be detrimental to working relationships. Turning now to the impact of the structural/bureaucratic variables, our results suggest that formalisation is useful in that that some minimum level of bureaucratic “initiation of structure” (e.g., Stogdill 1974) is necessary on NPD projects, whereas surprisingly, centralisation had a weak non-significant positive effect on working relations. The implication for senior management seems to be that some degree of organisational control is necessary for NPD project teams to be effective.

Limitations and Future Research Directions

A major limitation of our research is that it is restricted to R&D Managers’ perceptions of the relationship. Future research should seek dyadic data and examine the relationship from both perspectives. Another limitation of our research is that we rely on cross-sectional data to draw inferences regarding CFRs which develop and are enacted over time. Future research could utilize longitudinal data to investigate these important phenomena. Another avenue for future research would be to simultaneously examine the antecedents and consequences of communication behaviours, and interpersonal trust, and their effects on working relationships. Ideally, a structural-model testing procedure should be used to provide the strongest test because it would involve examining all relationships in a single model.

References

- Aiken, M., and Hage, J. 1968. Organisational interdependence and intra-organisational structure. *American Sociological Review*. 33, 912–930.
- Anderson, E., and Weitz, B. 1989. Determinants of continuity in conventional industrial channel dyads. *Marketing Science* 8. 310-323.
- Anderson, J.C., and Narus, J.A. 1990. A model of distributor firm and manufacturer firm working partnerships. *Journal of Marketing*. 54 (January), 42-58.
- Ayers, D., Dahlstrom, R., and Skinner, S.J. 1997. An exploratory investigation of organizational antecedents to new product success. *Journal of Marketing Research*. 34 (February), 107-116.
- Burns, T., and Stalker, G.M. 1961. *The Management of Innovation*. London: Tavistock.
- Dougherty, D. 1992. Interpretive barriers to successful product innovation in large firms. *Organization Science*. 3 (2), 179-202.
- Fisher, R.J., Maltz E., and Jaworski, B.J.1997. Enhancing communication between Marketing and Engineering: The moderating role of relative functional identification. *Journal of Marketing*. 61 (July). 54-70.
- Gabarro, J. 1990. The Development of Working Relationships. In *Intellectual Teamwork: Social and Technological Foundations of Cooperative Work*. Eds. J. Galagher, R.E. Kraut, and C. Egado. Hillsdale, NJ: Erlbaum. 79-110.
- Griffin, A., and Hauser. J.R.1996. Integrating R&D and Marketing: a review and analysis of the literature. *Journal of Product Innovation Management*. 13, 191- 215.
- Gupta, A.K., Raj, S.P., and Wilemon, D. 1985. The R&D/Marketing interface in high-technology firms. *Journal of Product Innovation Management*. 2, 12-24.
- Gupta, Ashok K., S.P. Raj, and David Wilemon. 1986. "A Model for Studying R&D-Marketing Interface in the Product Innovation Process." *Journal of Marketing* 50 (2) April: 7-17.
- Gupta, A.K., and Wilemon, D. 1988. The credibility-cooperation connection at the R&D-Marketing interface. *Journal of Product Innovation Management* 5, 20-31.
- Jassawalla, A.R., and Sashittal. H.C.1998. An examination of collaboration in high-technology new product development processes. *Journal of Product Innovation Management*. 15, 237-254.
- Kahn, K.B. 1996. Interdepartmental integration: a definition with implications for product development performance. *Journal of Product Innovation Management*. 13, 137-151.

- Lawrence, P.R. and Lorsch. J.W. 1967. *Organization and Environment*. Homewood, ILL: Irwin-Dorsey.
- Maidique, M.A., and Zirger, B.J. 1984. A study of success and failure in product innovation: the case of the U.S electronics industry. *IEEE Transactions on Engineering Management*. EM-31 (Nov), 192 –203.
- Maltz, E., Souder, W.E.,and Kumar, A. 2001. Influencing R&D/Marketing integration and the use of market information by R&D managers: intended and unintended effects of managerial actions. *Journal of Business Research*. 52, 69 -82.
- McAllister, D.J. 1995. Affect and cognition-based trust as foundations for interpersonal cooperation in organizations. *Academy of Management Journal* 38 (1), 24-59.
- McCann, J., and Galbraith. J.R. 1981. Interdepartmental relations. In *Handbook of Organizational Design, Volume 2. Remodelling Organisations and their Environment*. Eds. Paul C. Nystrom and William H. Starbuck. Oxford University Press, 60-84
- Mintzberg, H. 1979. *The Structuring of Organizations*. Englewood Cliffs, NJ: Prentice-Hall.
- Mittal, B. 1996. Trust and relationship quality: a conceptual excursion. *Centre for Relationship Marketing Conference Proceedings*. June, 230-240.
- Moenaert, R.K., and Souder. W.E. 1990a. An information transfer model for integrating Marketing and R&D personnel in new product development projects. *Journal of Product Innovation Management*. 7 (June), 91-107.
- Mohr, J.J., Fisher, R.J., and Nevin, J.R., 1996. Collaborative communication in interfirm relationships: moderating effects of integration and control. *Journal of Marketing*, 60 (July), 103–115.
- Moorman, C., Deshpandé, R., and Zaltman, G., 1993. Factors affecting trust in market research relationships. *Journal of Marketing*. 57 (January), 81-101.
- Moorman, C., Zaltman, G., and Deshpandé, R. 1992. Relationships between providers and users of market research: the dynamics of trust within and between organizations. *Journal of Marketing Research*. 29 (August), 314-328.
- Morgan, R.M., and Hunt, S.D. 1994. The commitment-trust theory of relationship marketing. *Journal of Marketing*. 58 (July), 20-38.
- Olson, E.M., Walker, O.C. Jnr., and Ruekert, R.W., 1995. Organizing for effective new product development: the moderating role of product innovativeness. *Journal of Marketing*. 59 (January), 48-62.
- Pugh, D., Hickson, D., Hinings, C.R.and Turner, C. 1968. Dimensions of organizational structure. *Administrative Science Quarterly*. 13 (June), 65-105.

Rajagopalan, N., Rasheed, A.M.A., and Datta, D.. 1993. Strategic decision processes: critical review and future directions. *Journal of Management*. 19 (Summer), 349-384.

Rempel, J.K., Holmes, J.G., and Zanna, M.P. 1985. Trust in close relationships. *Journal of Personality and Social Psychology*. 49 (1), 95-112.

Ruekert, R.W., and Walker, O.C. 1987. Marketing's interaction with other functional units. *Journal of Marketing*. 51 (January), 1-19.

Shaw, V., and Shaw, C.T. 1998. Conflict between engineers and marketers. *Industrial Marketing Management*. 27, 279-291.

Smith, B.J., and Barclay, D.W. 1997. The effects of organizational differences and trust on the effectiveness of selling partner relationships. *Journal of Marketing* 61 (January), 3-21.

Song, X. M., Neeley, S.M., and Zhao, Y. 1996. Managing R&D-Marketing integration in the new product development process. *Industrial Marketing Management*, 25, 545-553.

Song, X. M., Xie, J., and Dyer, B. 2000. Antecedents and consequences of marketing managers' conflict handling behaviours. *Journal of Marketing*. 64 (Jan), 50-66.

Souder, W. E. 1981. Disharmony between R&D and Marketing. *Industrial Marketing Management*. 10, 67-73.

Souder, W.E. 1987. *Managing New Product Innovations*. Lexington, Mass: Lexington Books.

Souder, W.E. 1988. Managing relations between R&D and Marketing in the new product development process. *Journal of Product Innovation Management*. 5 (March), 6-19.

Stogdill, R.M. 1974. *Handbook of Leadership: A Survey of Theory and Research*. New York: Free Press.

Thompson, J.D. 1967. *Organizations in Action*. New York: McGraw-Hill.

Van de Ven, A.H. 1976. On the nature, formation, and maintenance of relations among organizations. *Academy of Management Review*. 4 (October), 24-36.

Van de Ven, A., and Ferry, D.L. 1980. *Measuring and Assessing Organizations*. New York: John Wiley and Sons.

Weber, M. (1947). *The Theory of Social and Economic Organisation*. (Trans.) A.H. Henderson and Talcott Parsons. New York: The Free Press, (First published in German in 1924).

Wheelwright, S.C., and Clark, K.B. 1992. *Revolutionizing Product Development*. New York: The Free Press.

Williams, M. 2001. In whom we trust: group membership as an affective context for trust development. *Academy of Management Review*. 26 (3), 377–396.

Wind, Y.J. 1982. *Product Policy: Concepts, Methods and Strategy*. Reading, MASS: Addison-Wesley Publishing Co.