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The nature of cross-functional relationships during NPD projects has received considerable research attention with an emphasis on achieving successful integration. To achieve this functional integration new product development activities often require functional specialists to communicate with one another to achieve their respective task goals. This study examines the frequency of communication within NPD projects as reported by R&D Manager from 184 Australian NPD projects. We find that informal methods of communication have a positive relationship with three key NPD outcome variables such as perceived relationship effectiveness, interpersonal collaboration and NPD project success. This study provides empirical support for the proposition that while formal communication methods are useful in NPD activities the communication process should not be overly formalized and thus prevent informal communication to occur between managers.

Keywords

Frequency, communication, within, NPD, projects, Implications, for, key, measures, success

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Frequency of Communication within NPD Projects: Implications for Key Measures of Success

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Abstract

The nature of cross-functional relationships during NPD projects has received considerable research attention with an emphasis on achieving successful integration. To achieve this functional integration new product development activities often require functional specialists to communicate with one another to achieve their respective task goals. This study examines the frequency of communication within NPD projects as reported by R&D Manager from 184 Australian NPD projects. We find that informal methods of communication have a positive relationship with three key NPD outcome variables such as perceived relationship effectiveness, interpersonal collaboration and NPD project success. This study provides empirical support for the proposition that while formal communication methods are useful in NPD activities the communication process should not be overly formalized and thus prevent informal communication to occur between managers.

Key Words: communication frequency, cross-functional relationships, new product development, informal and formal communication.

Introduction

Moenaert and Souder (1990a) argued that the innovation process "is essentially informational, ... the transfer of information is therefore the major vehicle that allows individuals to become integrated (p.98)". The role of communication is to reduce uncertainty in the NPD process through information transfers between functional units regarding customer preferences, competitors and the environment (Souder and Moenaert 1992). The challenge for top management (e.g., CEO, senior executive) when trying to improve functional integration has focused traditionally on increasing communication and information-sharing between functions. This improved communication was in turn found to affect the level of co-operation between functions. The NPD literature clearly identifies information transfer between Marketing and R&D as one of the key antecedents to effective CFRs and provides theoretical justification and empirical evidence for the proposition that an increased volume of information transfer is associated with greater integration between the Marketing and R&D functions, and subsequently with a higher level of NPD success (Gupta, Raj and Wilemon, 1988; Maidique and Zirger, 1984; Moenaert et al 1992; Ruekert and Walker, 1987).

Griffin and Hauser (1996) in their review of the CFR literature identified the benefits of increased communication frequency between the two functions as being improved mutual understanding, more harmonious relations, an appreciation of the information styles and communication preferences of individual managers, better conflict resolution, and the development of trust. Communication frequency refers to the number of times information is exchanged between functional areas over a period of time (c.f Van de Ven and Ferry 1980). It is measured as the intensity of information flows through all available forms of

communication, for example, formal meetings, reports to informal chats, emails, telephone conversations. In this paper we examine communication frequency between functional managers working on NPD projects and their preferences for informal and informal communication methods. Where formal communication is defined as that which occurs through scheduled structured means e.g., formal NPD systems, meetings, and where informal communication occurs in an impromptu manner not requiring any planning.

The examination of communication methods and preferences between functional managers and the association with key NPD outcomes will shed light on the debate over the role of communication as an integration mechanism (Kahn 1996, Kahn and Mentzer 1998). Our findings help inform integration decisions by senior management as we show that informal communication methods are valuable in achieving positive NPD project outcomes (Olsen, Ruekert and Walker 1995). Senior management should avoid overly formalized NPD systems that prevent informal communication to occur. The paper is organized in the following manner, we describe the theoretical framework, give a description and justification of the key NPD outcome measures used, present the methodology, describe the measurement and operationalisation of the key outcome variables, present the results and then discuss their implications.

Theoretical Framework

This research draws upon the interaction approach to functional relations which is used in many important studies of marketing's relationships (e.g., anon and anon 2005; Fisher, Maltz and Jaworski 1997; Moenaert *et al*., 1994; Ruekert and Walker 1987) , and focuses on how factors such as communication predict satisfaction, performance, and relationship continuity in various contexts, for example, buyer-seller and channel relationships (cf. Anderson and Narus, 1990; Morgan and Hunt, 1994), and cross-functional relationships (e.g., Ruekert and Walker 1987). The interaction approach is an appropriate theoretical framework to use as it captures the communication processes between functional specialists (Moenaert et al, 1994). It is effective communication during NPD which is an aspect of highly integrated functions and a hallmark of collaborative relationships between functional managers (Jassawalla and Shashittal, 1998).

Key NPD Outcome Variables

In this study we use three outcome measures, firstly, perceived relationship effectiveness (PRE) a subjective measure used in past studies of cross-functional relationships. Secondly, interpersonal collaboration which has been suggested as a measure which captures the behavioural aspects of cross-functional working relationships, and finally, the traditional measure of NPD project success based on financial return to the organization. We describe the three measures below:

Perceived Relationship Effectiveness: The outcome variable of *perceived relationship effectiveness* is drawn from Van de Ven (1976) and relates to the extent to which 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) this construct is operationalised at the interpersonal level rather than the interdepartmental level. This subjective outcome

measure is used as there is significant empirical evidence to suggest that effective communication is strongly associated with successful product development outcomes (e.g., Souder 1981, 1988).

Interpersonal Collaborative Behaviour: Collaborative behaviour is the expression of all the positive aspects of interpersonal working relationships, that is, effective communication, trusting behaviour, volitional co-operation, mutual problem solving, and esprit de corps. As such, the concept of interpersonal collaboration is grounded in social exchange theory (Blau, 1964). Interpersonal collaborative behaviour is distinct from co-operation, where people may co-operate with each other because they feel that they have to i.e., where participants do not want to engage in such behaviours but feel constrained by organisational pressures (e.g., task specification, politics). Interpersonal collaboration is a form of "volitional co-operation", where participants want to co-operate with and freely interact with others. When collaborative behaviour occurs amongst managers, there is a tendency to view the relationship as productive and the other manager in a favourable way (Jassawalla and Shashittal, 1998; Kahn, 1998; Kahn and Mentzer, 1998).

New Product Project Success: Measuring a projects success or failure is an accepted practice of many NPD active companies (Griffin and Page, 1993; Kahn, Barczak and Moss, 2006). New product success was conceptualised as the extent to which the project met several important performance measures drawn from the literature (Griffin, 1997; Griffin and Page, 1993; Mooreman, 1992). Our conceptualisation focussed on budget, time, sales, profit aspects and the overall performance perspective. Research suggests that NPD projects that have greater communication tend to be more successful (Griffin and Hauser 1996).

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.

Operational Measures and Measure Refinement

Communication frequency was measured using an 11 item scale based on the most common communication methods identified in the literature (Fisher, Maltz, and Jaworski, 1997; Morgan and Piercy, 1998) and was measured using a 7 point scale anchored by Never (1) to Very Frequently (7). The three reflective multi-item constructs used in this paper were measured on a seven-point scale anchored by 1 "Completely Disagree" and 7 "Completely Agree." All constructs displayed good measurement properties e.g., perceived relationship effectiveness $\alpha = .94$, interpersonal collaboration $\alpha = .91$ and new product success $\alpha = .86$.

Descriptive Results

The most preferred methods of communication in rank order electronic mail (email) with a mean score of 4.37 (s.d = 1.728), impromptu face-to-face conversations (e.g., in the hall)

with a mean score of 3.75 (s.d = 1.816), scheduled one to one (face to face) meetings with a mean score of 3.60 (s.d = 1.755), and impromptu one to one phone conversations with a mean score of 3.41 (s.d = 1.676), reports with a mean score of 2.65 (s.d = 1.496), scheduled one-to-one phone conversations with a mean score of 1.97 (s.d = 1.375), voice mail with a mean score of 1.92 (s.d = 1.493), informal face-to-face conversations in a non-work setting (e.g., after-work drinks, barbecues etc.) with a mean score of 1.59 (s.d = 1.013), teleconferencing with a mean score of 1.51 (s.d = 1.124), hand written memos with a mean score of 1.49 (s.d = .978), and fax machine with a mean score of 1.31 (s.d = .819).

Table 1: Correlations of Communication Methods with Key NPD Outcome Variables

Communication Method	Mean *(Rank order)*	Std. Dev.	Perceived Relationship Effectiveness	Interpersonal Collaboration	NPD Success
Impromptu **face-to-face** conversations (e.g., in the hall)	**3.75** ***(2)***	1.816	**.168***	**.240***	.123
Impromptu **one-to-one** phone conversations	**3.41** ***(4)***	1.676	**.284****	**.316****	**.206****
Informal **face-to-face** conversations in a non-work setting (e.g., after-work drinks, barbecues etc.)	**1.59** ***(8)***	1.013	**.170***	**.150***	**.145***
Electronic mail (e-mail)	**4.37** ***(1)***	1.728	**.187***	**.209***	**.175***
Voice mail	**1.92** ***(7)***	1.493	.141	.056	.090
Scheduled **one-to-one** meetings (face-to-face)	**3.60** ***(3)***	1.755	**.252****	**.225****	**.145***
Scheduled **one-to-one** phone conversations	**1.97** ***(6)***	1.375	.044	.073	-.007
Teleconferencing	**1.51** ***(9)***	1.124	.046	.041	-.019
Hand written memos	**1.49** ***(10)***	.978	.107	.122	.116
Reports	**2.65** ***(5)***	1.496	.105	**.159***	**.161***
Fax machine	**1.31** ***(11)***	.819	.062	.087	.071

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Correlations with Key Project Outcome Variables

Correlation analysis revealed that perceived relationship effectiveness had a positive associations with several communication methods, impromptu one-to-one phone conversations (.284**), scheduled one-to-one meetings (.252**), electronic mail (.187*), informal face-to-face conversations in a non-work setting (.170*), impromptu face-to-face conversations (.168*). Interpersonal collaboration also had positive associations with several communication methods, impromptu one-to-one phone conversations (.316**), impromptu face-to-face conversations (.240*), scheduled one-to-one meetings (.225**), electronic mail (.209*), reports (.159*), and impromptu face-to-face conversations in a non-work setting (.150*). NPD success also had positive associations with several communication methods, impromptu one-to-one phone conversations (.206**), electronic mail (.175*), reports (.161*) and scheduled one to one meetings (.145*).

Discussion of Results

The new product development process is often a very formalised processes within many organizations and has seen NPD systems such as quality functional deployment (QFD) introduced to ensure that communication between functional specialists does occur and is documented with the process (Griffin, 1992). The results indicate that while the more formal communication methods such as scheduled face-to-face meetings and reports are important in cross-functional relationships the results indicate that many of the non-formal *(i.e., informal)* communication methods also have a positive relationship with the three NPD success measures. In particular, where a manager can communicate with another manager directly, by impromptu one to one phone conversations, seems to be effective in cross functional relationships. This finding can be explained to a large degree by the very nature of NPD work where there are often complex problems to solve, high uncertainty and the occurrence of many unanticipated problems. Not having to go through formal channels when needing assistance for such things as problem clarification or project updates is very useful for managers who are often under severe time pressure. In contrast, the more formalised communication methods of scheduled one to one phone conversations and teleconferencing had a negative non-significant association with success measures possibly indicating that the effort and organization required to arrange such communication is counterproductive. Of interest is that informal communication methods had the highest positive association with interpersonal collaboration possibly reflecting the nature of working relationship where the managers cooperate volitionally and with a sense of teamwork (Kahn, 1998). The implication of these findings for NPD work is that while formalised communication is necessary in NPD project they should not be over formalized. The ability to communicate with another manager, quickly and directly, without having to go through a formal process is valuable in achieving positive results.

Limitations and Future Research Directions

One limitation of these results and a possible future research direction is the interpretation of "email" as either a formal or informal communication method. Email had a positive association with all outcome variables indicating that it is an effective communication technique, however, it can be interpreted as a highly formalised technique where there is a

clear audit trail, or it can be used as an informal primary communication pattern between "friends" exchanging not only relevant work information but also allowing social exchange. This paper only examined communication frequency which does not capture the complexity of interpersonal communication, future research could examine other communication variables such as communication openness and communication quality to obtain a more complete picture of communication within NPD projects.

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