An Empirical Test of the Information Processing and Socio-political Perspectives in New Product Development Projects

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Abstract

New product development research draws on a range of different theories, though no overarching theory explaining NPD success has emerged. Atuahene-Gima and Evangelista (2000) however identified an underlying dichotomy in existing theories: economically rational approaches, and socio-political approaches. In this paper we test a model which reflects this dichotomy, and using data from 184 NPD projects, we provide empirical evidence that that this multi-lens theoretical approach has great potential to better understand factors driving NPD outcomes.

Introduction

It is well established that the effectiveness of new product development (NPD) projects is contingent on the quality of working relationships between NPD team members, many of whom come from very dissimilar departments, e.g., R&D, Marketing, and Manufacturing. Souder (1981; 1988) for example found that where there was "harmony" between members of NPD teams, 81.1% of NPD projects were either a complete or partial success, compared with only 31.6% when there was "severe disharmony." These early studies were instrumental in stimulating important work identifying factors influencing the effectiveness of these "cross-functional relationships" (CFRs) during NPD. Important studies in this area have highlighted the role of various forms of interpersonal communication, and trust in Marketing/R&D CFRs during NPD projects (e.g., Massey and Kyriazis 2007).

Whilst these existing studies have added greatly to our understanding of what drives effective working relationships between managers involved in NPD projects, they draw on a very wide range of theoretical frameworks. As yet we lack an integrative theoretical framework predicting what makes NPD teams successful or otherwise. Many existing studies for example, draw on the "interaction approach" (e.g., Moenaert et al. 1994). However this theoretical framework has been criticized by various scholars (e.g., Kahn 1996) for being too narrowly focused, by primarily examining only communications/interactions between NPD team members. Kahn (1996) himself advanced the debate by advocating a "collaboration approach" which is predicated on factors such as a shared vision within the NPD team, collective goals, and esprit de corps, rather than simply focusing on interactions, and interaction frequency.

Importantly for this current paper, a useful organizing framework was recently proposed by Atuahene-Gima and Evangelista (2000). Their attempt to synthesize the relevant literature in the area of Marketing/R&D integration during NPD led them to draw a distinction between "economically rational" and "socio-political" theoretical frameworks. The purpose of this current paper therefore, is to provide evidence demonstrating the utility of using these two frameworks, particularly the socio-political framework, to better understand factors driving the effectiveness of NPD project teams.

Theoretical Frameworks

Consistent with Kahn (1996), Atuahene-Gima and Evangelista (2000) have noted that much of the work examining the effectiveness of CFRs within NPD teams has focused on communication/interactions between team members (e.g., Moenaert et al. 1994). Accordingly, Atuahene-Gima and Evangelista (2000) refer to these theoretical frameworks the "information processing perspective." The fundamental premise underlying this perspective is that NPD teams are information processing sub-systems within the firm, whose function is to make sense of a complex environment, and complex tasks, and execute these effectively, leading to the development of successful new products (cf. Moenaert and Souder 1990). Theories which fall under the rubric of the information processing framework would include Weber's (1924) theory of bureaucracy, and the "interaction approach" (cf. Kahn 1996).

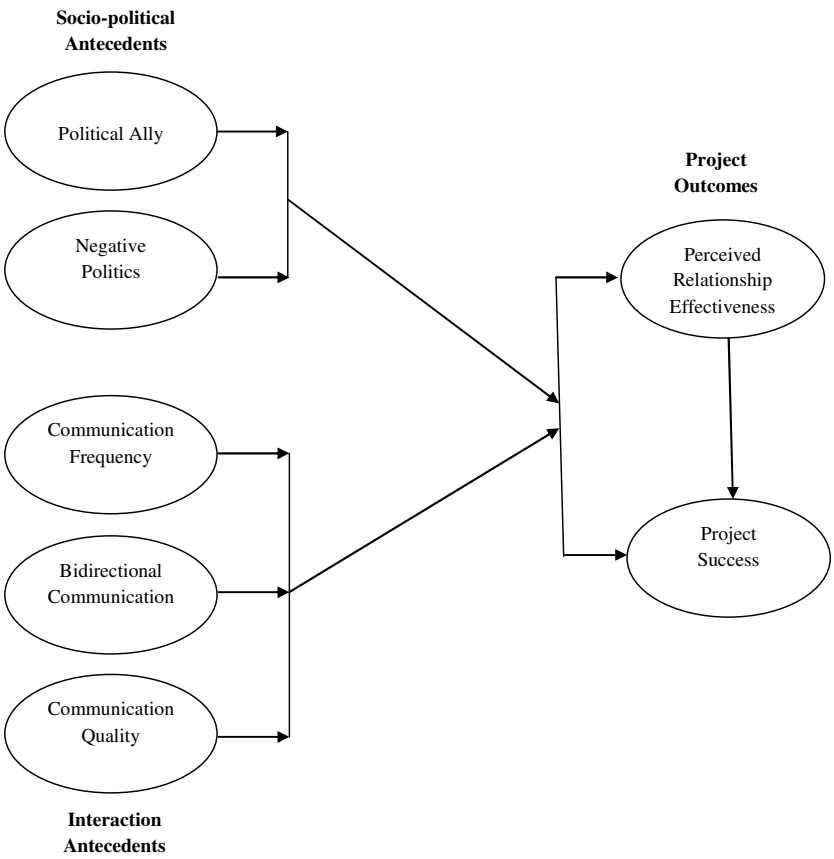
Whilst the information processing perspective is clearly a relevant theoretical framework, it has an inherent weakness, i.e., it largely ignores the social and political aspects of NPD team processes. As Atuahene-Gima and Evangelista (2000) note, NPD is an inherently political process, fraught with self interest, as different stakeholder departments and their managers compete for resources, power, and influence within the firm (cf. Frost and Egri 1991). Under the socio-political perspective, competing departments struggle for control and dominance in an attempt to influence NPD outcomes (Atuahene-Gima and Evangelista 2000). Accordingly, in addition to the information processing perspective, we need to add another theoretical lens to capture these political processes, i.e., a socio-political perspective.

Conceptual Model and Hypotheses

Presented on the following page is the conceptual model tested in this research. The two project outcome variables for this study include a "traditional" measure used in NPD studies, i.e., the extent to which the NPD project is deemed a success. Second, given the compelling evidence provided by Souder (1981) about the benefits of harmonious CFRs during NPD projects, perceived relationship effectiveness is also included in the model, and we posit a positive relationship between this variable and project success (H1).

Two sets of antecedent variables are used to predict these dependent variables, the first of which are the two socio-political variables. One variable we use is the extent to which the respondent R&D Managers perceive the Marketing Manager to be a political ally, and the second is the extent to which the R&D Manager believes that the Marketing Manager acted negatively, playing politics during the NPD project. We expect that where the R&D Manager perceives the Marketing Manager to be a political ally, that they will also perceive their working relationship to be effective (H2a) and the project a success (H2b). In contrast, when the Marketing Manager is perceived to have used negative political tactics during the NPD project, the R&D Manager will perceive the relationship to be less effective (H3a), and the project less successful (H3b).

Figure 1



The second set of antecedents are the communication/interaction variables, which are included to capture the information processing aspects of Marketing/R&D CFRs during NPD projects. Three communication variables are included in the conceptual model, communication frequency, bidirectionality, and quality. Communication frequency is defined as the intensity of information flow through media such as electronic mail, memos, and face-to-face meetings (Morgan and Piercy 1998). Consistent with Fisher et al. (1997), bidirectionality is defined as the extent to which communication between the two managers is a two-way process, and consistent with Moenaert et al. (1992) communication quality is defined as how credible, understandable, relevant, and useful the information provided by the Marketing Manager was for the R&D Manager's task completion. Given the logic underlying the information processing perspective, i.e., that communication is fundamental to CFR effectiveness and NPD success, we posit that all three communication variables will be positively associated with both perceived relationship effectiveness (H4a, H5a, and H6a), and with project success (H4b, H5b, and H6b).

Methodology

The survey used a self-administered, pretested questionnaire mailed to R&D Managers in Australian firms who worked with Marketing Managers on NPD projects. Usable responses were received from 184 Marketing Managers (RR= 54%). Tests of nonresponse bias and key

informant competence indicated the data was acceptable. Principal components analysis revealed the measures were unidimensional. Convergent validity was established as the average variance extracted (AVE) of the reflective measures was > 0.5 (Bagozzi and Yi, 1988). Reliability was acceptable as the composite reliability for each scale was > 0.7. Discriminant validity was established, as the squared correlation for any pair of reflective constructs was less than the AVEs of each individual construct (Fornell and Larcker, 1981).

Model Testing

SmartPLS Version 2.0 (Ringle et al. 2005) was used to analyse the measurement and structural models, because of its ability to model using small samples. Second, no assumptions are made about multivariate normality, and third, the primary concern here is prediction of the endogenous variables (cf. Chin 1998; Diamantopolous and Winklhofer 2001). In order to establish the stability and significance of the parameter estimates, the t-statistics were computed using 500 bootstrap samples.

Table 1: PLS Model Testing Results

Linkage in the Model	Hyp. No.	Std. Beta	t-stat
Relationship Effectiveness → Project Success	H1 (+)	.57	5.0015***
Political Ally → Relationship Effectiveness	H2a (+)	.20	3.6158***
Political Ally → Project Success	H2b (+)	.00	0.0312
Negative Politics → Relationship Effectiveness	H3a (-)	-.24	3.8688***
Negative Politics → Project Success	H3b (-)	.02	0.1790
Communication Frequency → Relationship Effectiveness	H4a (+)	.09	2.0816*
Communication Frequency → Project Success	H4b (+)	.08	1.1073
Bidirectional Communication → Relationship Effectiveness	H5a (+)	.20	2.5674**
Bidirectional Communication → Project Success	H5b (+)	.12	1.0691
Communication Quality → Relationship Effectiveness	H6a (+)	.31	3.8152***
Communication Quality → Project Success	H6b (+)	-.11	1.0211
Relationship Effectiveness R^2 = .66; Project Success R^2 = .37			

* p≤.05; ** p≤.01; ***p≤.001

Model Testing Results and Discussion

As can be seen from the results of the structural modelling presented in Table 1, the model has high explanatory power as it predicts 66% of the variance in relationship effectiveness, and 37% of the variance in project success. Moreover, 6 of the 11 hypotheses were supported. Specifically, the results for H1 confirm the importance of effective Marketing/R&D CFRs to the success of NPD projects via a high and positive standardized beta coefficient linking perceived relationship effectiveness to project success (β = .57, p≤ .001). More importantly though, the results clearly demonstrate the benefits of using both the economically rational, and socio-political frameworks to understand NPD project outcomes.

Turning first to the effects of the socio-political variables, as can be seen from Table 1, H2a was supported, suggesting that when an R&D Manager perceives the Marketing Manager to be a political ally, this increases the perceived effectiveness of their working relationship (β = .20, p≤ .001). Consistent with this, H3a was also supported, as the Marketing Managers' use

of negative political tactics reduced the R&D Managers perceptions of the effectiveness of their CFR ($\beta = -.24$, $p \leq .001$). As such, the use of the socio-political framework has allowed us to identify and quantify the effects of two important variables affecting NPD outcomes, one with positive effects (political ally), and one with negative effects (negative political behaviour). Had we not employed this second theoretical framework, we would therefore have omitted important explanatory variables predicting NPD project outcomes. One interesting finding from the modelling is that there were no direct effects from these two political variables on project success, so H2b and H3b were not supported. It therefore appears that the effects of these variables on project success are indirect, and are mediated by the perceived effectiveness of the working relationship.

In addition, these results support Atuahene-Gima and Evangelista's (2000) and Kahn's (1996) criticism that economically rational frameworks such as the information processing perspective are insufficient to fully understand or predict NPD outcomes. We argue this because not only do the political aspects of NPD projects have important effects on project outcomes, but the communication variables from the information processing perspective are very mixed in their effects. Communication frequency for example has only a modest effect on perceived relationship effectiveness ($\beta = .09$, $p \leq .05$), whilst the effects for the bidirectionality ($\beta = .20$, $p \leq .01$), and quality of communication ($\beta = .31$, $p \leq .001$) are much stronger. This reinforces the danger of managers falling into a "mere frequency" fallacy, i.e., that what is required to improve CFRs and NPD success rates, is simply more frequent communication. What is required is the use of more potent forms of communication such as bidirectionality, and quality. Last, and consistent with the results for the socio-political variables, none of these communication variables had direct effects on project success, rather, their effects on this important outcome variable are indirect, and are mediated by the effectiveness of the CFR. Again, this provides an important insight into the complex nature on NPD projects. It illustrates for example that "communication" per se is not a direct driver of NP success, it merely acts as a facilitator, by improving the effectiveness of Marketing/R&D CFRs during NPD projects.

Limitations and Directions for Future Research

The results of this study provide important insights into theoretical frameworks and underlying variables relevant to predicting NPD project outcomes, though the study has a number of limitations. First, we have modelled only two, albeit interesting "global" socio-political variables in this study, i.e., "political ally" and "negative politics." Future research could therefore extend this work by examining more specific socio-political variables on NPD outcomes, such as French and Raven's (1959) five bases of interpersonal power. In addition, the use of a socio-political framework suggests that an examination of the effects of various managerial "influence tactics" on NPD outcomes would be fruitful. Whilst some work has been done in this area (notably Atuahene-Gima and DeLuca 2008; Atuahene-Gima and Li 2000), there is still a dearth of studies examining the effects of these important behavioural variables within NPD teams. Last, the data used here are monadic and cross-sectional in nature, and future research could examine these issues using dyadic data (i.e., both the Marketing Manager and the R&D Manager reporting on the CFR), and a longitudinal research design to better capture the dynamics of communications, and political behaviour during NPD projects

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