

Research on Organizational Governance of Collaborative Innovation in New Product Development Projects

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Abstract: Currently, collaborative innovation is increasingly becoming the mainstream paradigm for new product development activities. Based on this, the influence of control and governance mechanisms within and between organizations and their interactions on the performance of new product development in collaborative innovation is discussed. The results show that formal control and inter-organizational trust within the organization have a positive impact on new product development performance, while professional control within the organization and inter-organizational contract control have no significant impact. The interaction between intra-organizational and inter-organizational controls significantly improves new product development performance.

1. Introduction

The NPD project involves technology and the process of connecting customer needs and a series of complex activities that are generalized from conception to commercialization, including creative screening, business analysis, technology development, test validation and product launch. Traditional NPD projects are implemented within the company. Increased global competition and accelerated technological change have rapidly changed customer preferences and shortened the life cycle of new products. Enterprises are paying more and more attention to the collaborative innovation paradigm and the involvement of external participants in NPD projects. Collaborative innovation in the NPD project is designed to create specific projects that meet new customer needs by working with the company's suppliers, customers, competitors, and public research organizations (research institutions and universities). Core companies in the NPD project may involve different corporate functions such as marketing, R&D, procurement, operations, finance, and external sources such as suppliers and customers. Appropriate organizational control is essential to coordinating the interests of all parties and can promote coordinated cooperation ^[1].

The governance mechanisms within an organization can be broadly divided into formal controls and professional controls. Formal control is achieved through compliance with performance standards and regulatory processes. First, formally control the project process and ensure that the

project is implemented according to the program. Formal control can supervise and promptly feedback members' lines. In order to avoid neglecting key activities, thereby improving resource utilization efficiency, ensuring project progress and achieving NPD project quality. Second, formal controls also help to identify specific and clear project objectives and encourage members to focus on activities related to the goals. This governance mechanism reduces the ambiguity of members' roles and improves resource utilization efficiency to improve the performance of NPD projects. In summary, formal control within the organization provides clear objectives and specific procedures for NPD projects, thereby reducing role ambiguity between members and improving resource utilization efficiency. Therefore, this paper proposes the following assumptions:

H1: The level of formal control within the organization has a significant positive impact on the performance of NPD projects.

H2: The level of professional control within the organization has a significant positive impact on NPD project performance.

In the NPD project, it is very important for the company to cooperate with external partners such as suppliers, joint development partners, distributors, etc., especially when the research and development time is tight and the R&D resources are scarce. Therefore, cross-organizational governance is often seen as an important means of dealing with partnerships. Contract control refers to the extent to which inter-organizational relationships are bound by formal contracts. The contract provides clear and legal institutional rules to define the responsibilities of the partners and to design penalties to constrain the partner's misconduct. Contracts play a controlling and coordinating role in the exchange relationship. The contract allows the company to choose partners who are unable or unwilling to comply with the agreed terms, especially when the partner deliberately hides their knowledge or requests to terminate the cooperation after obtaining knowledge from the resources of other participants. By identifying role descriptions and responsibilities, contracts can coordinate and help parties understand related obligations. Therefore, this paper proposes the following hypothesis:

H3: The level of contractual control between organizations has a significant positive impact on the performance of NPD projects.

H4: The level of trust between organizations has produced a performance for NPD projects significant positive impact.

Inter-organizational control (contracts and trust) helps to obtain external resources, which facilitates NPD performance. Effective resource utilization can enhance the effectiveness of external resources. A high level of formal control within the organization helps to understand the project objectives, processes, and members of their roles. In this case, the members will work more actively and will effectively apply the resources obtained from the parties to the new product. As a result, technology and market information resources can flow smoothly between different departments and can be used more efficiently. Therefore, this paper proposes the following hypothesis:

H5: The interaction between formal control within the organization and contract control between organizations has a significant positive impact on the performance of the NPD project. As the level of formal control within the organization increases, the positive effects of contractual control between organizations will be strengthened.

H6: The interaction between formal control and trust between organizations has a significant positive impact on the performance of NPD projects. As the level of formal control within the organization increases, the positive role of trust control between organizations will be strengthened.

H7: The interaction between professional control within the organization and contract control between organizations has a significant positive impact on the performance of the NPD project. As the level of professional control within the organization increases, the positive impact of inter-organizational contracts will increase.

H8: The interaction between professional control and trust control within the organization has a significant positive impact on the performance of the NPD project. As the level of professional control within the organization increases, the positive role of trust control between organizations will be strengthened.

2. Empirical Research

2.1. Sample and Data Collection

This paper collects data from Chinese manufacturing companies through questionnaire survey, and the survey object is the participation of enterprise NPD projects. A total of 512 questionnaires were distributed in this survey. After half a year, 327 questionnaires were returned, and the questionnaire response rate was 63.87% ^[2].

2.2. Variable Measure

(1) Formal control within the organization. This article uses eight project measurement scales to examine the process and procedures for project managers to set and monitor objectives (project NPD team goals, market goals).

(2) Cross-organizational contract control. Based on the work of Goo et al. (2009), three measurement projects were designed and asked the respondents to indicate whether they signed a clear and detailed contract with the partner, such as “We have a formal agreement with the customer (or supplier). The responsibilities of both parties are stipulated”.

(3) Cross-organizational trust control. The measure of trust in this paper is based on Hartman's (2000) trust model, which has six projects, namely, the ability to believe others, integrity and honesty, and confidence in the commitment of others, for example, “all parties have the ability to complete their own The tasks of the parties are mostly honest and honest”.

3. Empirical Test Result

3.1. Reliability and Validity Test

The Cronbach's α coefficient and the latent variable combination reliability are used to test the reliability. The Cronbach's α coefficients of the FC, PC, CC, TC, and NPDP scales are all greater than 0.7, which is very good. The range of the interval of the letter; and the corresponding combination reliability is greater than 0.5, which satisfies the reliability requirement. The average extracted variance value (AVE) varies from 0.536 to 0.734, both of which are greater than 0.5, indicating that the convergence validity of the structural variables meets the requirements.

3.2. Hypothetical Test

This study conducted a hierarchical regression analysis in two phases. NPD project performance is a dependent variable for all models. First, the independent variables (formal control within the organization, professional control, inter-organizational contract control, and trust control) are entered into the model 1 to test H1-H4. Then, based on model 1, the interaction item (formal control \times contract control) enters model 2, and the interaction item (formal control \times Trust Control) Enter Model 3, Interaction Item (Professional Control \times Contract Control) Input Model 4, Interaction Item (Professional Control \times Trust) In Model 5, H5-H8 is checked with Model 2 to Model 5, respectively. H5, H6, H7 and H8 are involved in the interaction of tissue internal control and cross-organizational

control. Model 2 shows a significant positive correlation between formal control and contract control interactions and NDP performance, supporting H5. Model 3 shows that the interaction between formal control and trust control is significantly positively correlated with NDP performance, and H6 is supported. Similarly, from the statistical results of Model 4 and Model 5, the interaction between professional control and contract control, and the interaction between professional control and trust control are significantly positively correlated with NDP performance, thus supporting H7 and H8 ^[3].

4. Conclusions

This paper examines the relationship between intra- and cross-organizational governance mechanisms and NPD project performance in collaborative innovation. Specifically, this study focuses on the interaction of intra- and inter-organizational controls on NPD project performance. Studies have shown that formal control has a significant positive impact on NPD, but professional control has no significant impact on NPD project performance. Formal control can motivate teamwork and coordinate interdependent team activities to significantly improve the performance of NPD projects. In contrast, the effectiveness of professional controls may be related to project teams and project characteristics. NPD projects have multiple risk attributes that weaken the positive impact of informal professional controls on NPD performance.

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References

- [1] Sidibé, A. (2012) *Innovation processes navigated by women groups in the Malian shea sector: How targeting of international niche markets results in fragmentation and obstructs co-ordination*, *NJAS - Wageningen Journal of Life Sciences*, 1, 29-36.
- [2] Robert, K. (2004) *Managing diversity in a system of multi-level governance: the open method of co-ordination in innovation policy*, *Journal of European Public Policy*, 2, 249-266.
- [3] Virginia, A. (2005) *Governance and co-ordination of distributed innovation processes: patterns of R&D co-operation in the upstream petroleum industry*. *Economics of Innovation and New Technology*, 14, 1-21.