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The Effect of Organizational Structure on Open Innovation: A Quadratic Equation

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Abstract

Open innovation has recently begun to receive increasing attention in organizational research. Studies on open innovation have emphasized the impact of organizational structure on both inbound and outbound open innovation but have tended to focus on the former. This study attempts to provide a better understanding of open innovation within the context of open source by examining 2,811 projects, especially in GitHub. The analysis results reveal that the decentralization of decision-making encourages both inbound and outbound open innovation. The impact of the decentralization of decision-making differs between inbound and outbound open innovation, a finding that both scholars and practitioners must consider.

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Keywords: Decision-making Structure; Decentralization; Open Innovation

1. Introduction

Open innovation has received much attention in organization research due to its numerous benefits, such as its sharing of risks and resources with partners and its better adaptation to the needs of the rapidly changing market [1, 2]. Firms are increasingly adopting open innovation strategies [3], the paradigm of which consists of two dimensions: inbound open innovation and outbound open innovation. The literature on open innovation has explored both open innovation types [4, 5]; however scholars have mainly focused on inbound open innovation [6]. Open innovation is becoming more popular, with numerous innovation platforms and external participant developments appearing on the Internet [7]. To put ideas from external sources into action, each organization must identify the best ideas, conduct internal feasibility and profitability analyses, and implement them in development projects. For this purpose, organizations should develop organizational architecture suitable for open innovation, including structures, processes, and routines [4, 8].

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Organizational structure is an important managerial lever for open innovation [9, 10]. Since the development of internal networks is required for the successful management of acquired external knowledge [11], this study concentrates on an important aspect of organizational structure: the degree of decentralization of decision making. Effective decision and organizational architecture can contribute greatly to innovation success [12, 13]. The research has repeatedly shown that organizational performance decreases when control is strengthened through an increased centralization of authority [13, 14]. The initiative of subordinates and innovative ideas may be discouraged under a centralized decision-making structure [15], as organizations face structural difficulties in generating innovation: "Along this tree from foot to crown, ideas flow up and vetoes down" ([16] p. 276). In other words, performance is positively associated with the decentralization of decision making. However, a centralized structure is also important for open innovation. For example, P&G uses centralized decision making in its Connect and Develop strategy since it fosters risk-taking, monitoring, and long-term thinking [3, 17]. Thus, the important question is how innovation is affected by the centralization or decentralization of the decision-making authority [18]. The decision making structure plays an important role in the success of open innovation.

We therefore investigate the role of decision-making structures in open innovation through hypotheses with quadratic terms. The objective of our analysis is to study the effect of the decision making structure on the degree of both inbound and outbound open innovation at the project level. Decision making usually occurs at the project level, as many companies develop their firm-level capabilities through innovation projects [1, 19]. Hence, project-level studies can provide a deeper understanding of decision-making processes in open innovation [19]. To answer our research question, we explore the open source context, specifically the social coding site GitHub, because the mechanisms of the development of open innovation offer a wide range of alternatives, including open source platforms [20].

2. Conceptual Background and Hypotheses

2.1. Open innovation (inbound/outbound)

Chesbrough, Vanhaverbeke and West [2] have suggested two conceptually distinct dimensions of open innovation: inbound, or outside-in, open innovation and outbound, or inside-out, open innovation. Since then, the literature on open innovation has emphasized both dimensions [4, 5]. However, past studies have concentrated more on inbound open innovation [21], although every inbound open innovation in one organization generates a reciprocal outbound open innovation from another [22]. The effectiveness of open innovation depends on the ability to handle decentralized innovation processes [23], and organizations can benefit from knowledge voluntarily provided by external participants [7, 24]. In this sense, the literature on Free/Libre Open Source Software (FLOSS) can offer insight into the open innovation concept by, for example, arguing that addressing diffuse needs is important for the success of FLOSS projects since this can attract contributors [25]. In sum, past studies of open innovation implies that the consideration of both inbound innovation and outbound innovation is important within the context of open source.

2.2. Organizational structure: Structure of decision making

Previous studies have investigated the design of decision-making structures from many perspectives, since their properties are multifaceted [26]. The literature on the decentralization of information has consistently revealed that organizational structures can be designed to optimize efficiency under limited capacity [27, 28]. By contrast, Sah and Stiglitz [29] and others [30, 31] have focused on human evaluation, identifying two kinds of decision-making structure and explaining how they differ systematically in terms of human fallibility. Dessein and Santos [32] developed a theory for integrating task specialization and coordination in the analysis of organizational structure. Their basic idea is that decentralizing decisions facilitates the usage of local knowledge