The Effects of Network Structures on Knowledge Retrieval

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Abstract

In this research, it will be analyzed a mechanism of knowledge generation and capturing value from a firm’s investment in knowledge, namely: knowledge retrieval, which is defined as “the reabsorption of one’s own spilled knowledge that has been leveraged externally” [1]. Specifically, this research will evaluate the effect of structural holes and degree centrality of inventors and of their knowledge portfolio elements on knowledge retrieval, in a firm’s network. The major objective of this study is to investigate how these structural features affect knowledge retrieval in two distinct networks (knowledge and social) at an individual level of analysis.

To be more precise, it will be argued that an organization comprises two disparate networks: a knowledge network of knowledge elements and a social network of researchers [4]. Hence, it will be evaluated the different meaning and implication of the structural features: structural holes and degree centrality in a knowledge network as well as in a social network, illuminating their positive or negative impact on individuals’ knowledge retrieval.

In order to examine the aforementioned aspects, the research will use a context where the intellectual property is the cornerstone for the revenues of the firms; the semiconductor industry. The measures draw on the patent data files of the United States Patents and Trademark Office (USPTO) (for similar approaches see [1, 2, 3]). A longitudinal data structure will be employed for robust testing and construct the unique intrafirm networks for each firm for every year of observation. Specifically, the validity of the hypotheses will be examined on the knowledge and social networks of individuals of twenty-three large semiconductor firms over a long period of monitoring (1976-2017).

The research presents theoretical and practical implications as well as methodological novelties. As such, this research aims at filling the gap in current global literature regarding the relationship between knowledge retrieval and network structural features. Specifically, the study makes a major contribution to research on absorptive capacity and network theory by demonstrating the significance of the structural features of individuals’ positions and of their knowledge portfolio elements’ positions in firm’s internal networks, in relation to the individuals’ ability to reabsorb knowledge after it spills to and is leveraged by an external firm (knowledge retrieval). Moreover, this research extends the current literature on knowledge management and networks, since it evaluates the phenomenon of knowledge retrieval under the perspective of two decoupled networks: social network and knowledge network.

In addition to theoretical contributions, there are also managerial implications, which may be conclusive from this research. Specifically, the study examines: how the structural features of individuals and their knowledge elements in the internal networks of a firm increase the benefits of its R&D investment in its own original knowledge; whether the knowledge retrieval strategies are less or more effective under specific structural features; why the managers should preserve a balance between the knowledge capital and human capital without disregarding any of these significant channels with regard to improve knowledge retrieval.

Keywords: knowledge retrieval; social & knowledge networks; absorptive capacity.
References of Abstract