

Methodological proposal to map the circulation and conversion of knowledge in innovation networks

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This paper aims at proposing a scheme to understand innovation networks. Innovation is the result of numerous interactions among several actors and institutions that together form a network through which knowledge flows and is transformed until it reaches an economic result.

Our purpose is to open the “black box” of the innovation creation by studying how knowledge flows and is created and recreated during the innovative process.

The idea is to use the model proposed by Nonaka and Takeuchi (1997) and to extend it with some of the concepts used by Callon (1994), and with the interactive model of innovation (Kline & Rosenberg, 1986).

The model of Nonaka and Takeuchi is based on the assumption that human knowledge is created and expanded through the social interaction between tacit and explicit knowledge. First, tacit knowledge goes from an individual form to a collective form (socialization). It is worth emphasizing that tacit knowledge requires learning, social interaction and experience to be transferred. Second, collective tacit knowledge is converted into explicit knowledge (articulation). The codified knowledge is more easily made collective, because it is transformed into “information” which can be transmitted to a large number of individuals through information infrastructures. Finally, individuals internalize the explicit knowledge, which extends their tacit knowledge base. Thus, the “spiral of knowledge” starts all over again.

In this paper we want to understand the knowledge creation within innovation networks, and not only within a single organization. We recognize that innovation process is characterized by a constant interaction and feedback between research, design activities and market. Thus, the knowledge circulates through these poles, which are formed by many actors (research institutions, users, firms, external individuals, etc).

These actors are heterogeneous and constitute a network. Each actor acts and speaks in a different way. In the establishment of the social link between them many translation operations are necessary before the communication and exchanges could occur efficiently. However, the Nonaka & Takeuchi model of knowledge creation can explain appropriately the knowledge flows inside an innovation network. We found in our research analysis that knowledge is transformed from an individual to a collective dimension, and from the tacit to the explicit form. Meanwhile, translation process is much more difficult inside a heterogeneous innovation network than inside a single organization.

Case study: Sugar-cane Genetic Improvement Program of Campinas Agriculture Institute

References

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