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The interorganizational innovation processes of sustainable building: A Dutch case of joint building innovation in sustainability

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Abstract

This article's subject is the cooperation process between organizations that develop and implement innovations in sustainable building. Its main research question is how governmental and commercial organizations organize and structure their joint activities to develop innovations in sustainability. In the search for answers to this question the cooperative activities of innovating organizations are modelled as an interorganizational innovation process. The case study research method is used to investigate the development of interorganizational innovation patterns in sustainability in seven house-building projects in the Dutch residential building sector. The empirical research findings are discussed by means of a comparison with the theoretical framework that includes five complementary stage models of interorganizational innovation processes. The main conclusions of the research are that (1) governmental and commercial organizations that successfully innovate in sustainability go through eight consecutive stages of interorganizational innovation, and (2) perform twenty-two interaction patterns that are part of these stages.

Keywords: Sustainable building; Sustainability; Building innovation; Interorganizational innovation

1. Introduction

Sustainable building has developed from a new field [1] towards a discipline comprising various practical and scientific issues [2–5]. Important international issues, affecting the interests of both practitioners and researchers are for example the environmental assessment of buildings, best practices for sustainable building, environmental design methods in materials and structural engineering, urban sustainability, and deconstruction [6]. In some cases governments and commercial organizations in the building industry are cooperatively innovating in these fields of sustainability [5,7–9]. A relevant question is how the governmental and commercial organizations organize and structure their joint activities to develop innovations in sustainability. This article explores answers to this question. It provides a theoretically and empirically grounded description and discussion of the stages and interaction patterns used by building partners in the cooperative sustainable building process. The article is in six sections. This first section introduces the central research theme. Section 2 reviews the literature on interorganizational innovation processes. Section 3 presents the design of an empirical case study research project in the Dutch residential building sector. Sections 4 and 5, respectively describe and discuss the empirical research results, and Section 6 summarizes the main answers to the project's research question.

2. Interorganizational innovation processes

The cooperative practices between various governmental and commercial organizations in the building sector to develop innovations in sustainability, can be modelled as an interorganizational innovation process. This section is the result of a review of the literature on interorganizational innovation processes and it presents five-stage models. These models serve as the theoretical framework for the description and discussion of the empirical research.

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Kreiner and Schultz [10] distinguish three stages in the interorganizational innovation process: (1) discovering opportunities, (2) exploring possibilities, and (3) consummating collaboration. In the discovery stage, organizations discover collaborative opportunities with other organizations. In the exploration stage, they explore these opportunities and translate them into concrete interorganizational innovation projects. In the consummation stage, they develop innovation plans and realize them. Kreiner and Schultz's interorganizational innovation processes are linear: they start with the discovery stage, and end with the completion of the consummation stage.

Ring and Van de Ven [11] describe a three-stage model of interorganizational cooperation: (1) negotiations, (2) commitments, and (3) executions. In the negotiation stage, organizations discuss the possible terms and procedures of a potential relationship. In the commitments stage, they reach an agreement on the obligations and rules of the cooperation. Finally, in the execution stage, they carry out the agreements. Ring and Van de Ven's interorganizational cooperation processes are cyclic: organizations completing the last activities in the execution stage often enter the negotiation stage for a second, third, fourth time, and so on. The organizations continuously assess the efficiency, and equity, of all three stages. The outcomes of these assessments influence their willingness to participate in new cooperation cycles.

George and Farris [12] develop a four-stage model of the development of cooperative innovation processes: (1) recognition, (2) research, (3) relationship set-up, and (4) ramp-up. In the recognition stage, organizations recognize the need of an alliance. In the research stage, they investigate the prospects of alliances with several other organizations. In the relationship stage, they discuss and develop a collaboration plan. Finally, in the ramp-up stage, they realize this plan. George and Farris also define a fifth stage, which is beyond the vulnerabilities of the first four stages: (5) ongoing management. In this post-cooperative stage, the partnering organizations dismantle the alliance, and integrate the remaining activities in their own organizational structure. George and Farris' interorganizational innovation processes are linear: they start with recognition, and end with ongoing management.

Bossink [13] discusses a four-stage model of interorganizational innovation processes: (1) autonomous strategy, (2) cooperative strategy, (3) organization for co-innovation, and (4) innovation realization. In the autonomous strategy stage, organizations develop and market their innovations independently. In the cooperative strategy stage, they explore the possibilities to innovate with other organizations. In the organization stage, the organizations create a joint project for the development of the innovations. In the realization stage, the joint project produces and markets these innovations. Bossink's interorganizational innovation processes are cyclic: when the realization stage ends, the organizations dismantle the joint project, and re-enter the autonomous strategy stage.

Fisher and Varga [14] present a two-stage model of interorganizational innovation processes: (1) the pre-competitive stage, and (2) the competitive stage. In the pre-competitive stage, organizations exchange information, jointly identify new ideas, and conduct joint R&D. In the second and competitive stage, they develop a prototype, start pilot projects, and introduce their new products on the market. Fisher and Varga's interorganizational innovation processes are linear: they start with the pre-competitive stage, and end with the competitive stage.

3. Research design and methods

A research project is conducted to find answers to the question how governmental and commercial organizations in building organize and structure their joint activities to develop and implement innovations in sustainability. This section provides an overview and explanation of the design and methods of the research project.

Research in the field of interorganizational cooperation and innovation is often categorized as 'network research'. In this type of research the subject of study is the interaction between organizations and representatives of organizations, in a field of various organizations and representatives. In terms of Borgatti and Foster's [15] typology for network research, the research project that is carried out, can be classified as contagion network research: it seeks to find and explain the shared attitudes, cultures, and practices that are developed by interacting organizations and its agents. In addition, the methodology of the study is based on the methodological approach for network research described by Borch and Arthur [16]. Fig. 1 summarizes the key characteristics of the approach.

According to the first step of the approach a research framework is constructed. It consists of a research question and a theoretical framework. The research question is: how do governmental and commercial organizations organize and structure their joint activities to develop innovations in

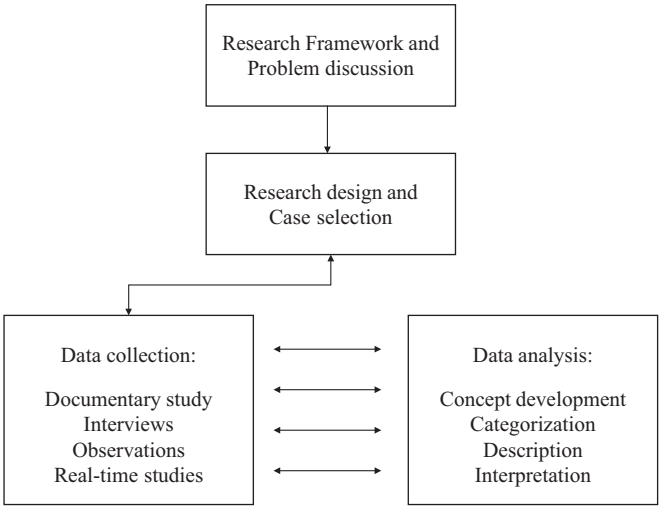

Fig. 1. Framework for network research (based on [16]).