Journal of Cases on Information Technology
Volume 21 • Issue 1 • January-March 2019

Structuration and Learning in a Software Firm:
A Technology-Based Entrepreneurship Case Study

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ABSTRACT

This case study presents the evolution of a software firm from startup into early internationalization. Building on a structuration theory, the case is framed within a conceptual model that illustrates the way skills and routines co-evolve both at the level of the founding entrepreneur (agency) and of the firm (structure). As such, this article contributes to an emergent structurational view of technology-based entrepreneurship. Such views places emphasis on learning both at the individual and collective level, in terms of software engineering, commercial, managerial and strategic capabilities. In addition, it supports a dynamic perspective of entrepreneurship in the software industry by covering not only the startup phase but also early growth and consolidation of the firm.

KEYWORDS

Collective Learning, Software Startup, Structuration Theory, Technology-Based Entrepreneurship

INTRODUCTION

This work presents a case study of technology-based entrepreneurship in the software industry. It is inscribed in an entrepreneurship research current which is critical with respect to placing the individual at the center of entrepreneurship, such as in Shane and Venkataraman (2000), where emphasis is placed alternatively on the opportunity. More specifically, it follows the work of (Sarason, Dean, & Dillard, 2006), where both entrepreneur and opportunity are meaningful and in fact inseparable. This, in turns, follows structuration theory (Giddens, 1986), the well-known sociological theory that aims at going beyond the traditional dualism between agency and structure in social systems. Sarason et al. address the opportunity which results in a startup (i.e. structure), together with the individual entrepreneur (i.e. agency), not as two isolated poles, but as mutually influencing each other. While Sarason *et al.* center their work on the initial moment of opportunity, this paper has a broader scope towards growth and consolidation of a new software firm, investigating the way the interaction between agency and structure is transformative and defines the firm's profile in time.

DOI: 10.4018/JCIT.2019010101

In addition to the dual level of analysis (entrepreneur-firm), this study places an emphasis on the dynamic nature of learning (cf. Aldrich & Yang, 2014). This dynamic character of entrepreneurial learning has been addressed in (Cope, 2005) who claims that entrepreneurship studies must consider not only the operation of entrepreneurship, but also the operation of the firm itself and especially the learning process involved. For Cope, the entrepreneur is still a relevant object of study, but not as a static agent. In consequence, he follows and extends the behavioral perspective of entrepreneurship, which is focused on what the entrepreneur does, not on who (s)he is, and proposes a dynamic learning perspective. Specifically, Cope includes the capability of the entrepreneur to learn and adapt, articulating this to the growth of the firm beyond its first years. As such, this paper extends Cope, explicitly including learning, but as a collective process that moves between the entrepreneur and the firm.

This article specifically focuses on technology-based entrepreneurship (TBE) in the software industry. In doing so, it relies on Garud & Karnøe (2003) as they also question entrepreneurship centered on a sole exceptional entrepreneur and use Gidden's structuration theory to argue that the momentum generated by a certain technology is determined by the confluence of different inputs. Accumulation of these inputs generates an emergent path that simultaneously enables and restricts the activity of related actors; the actors shape the path and the path shapes the actors through time. These paths are not planned but rather emerge through improvisation, adaptation and learning.

This inquiry is framed within a conceptual model which enables capturing and interpreting the findings related to the salient traits of the transformations experienced by the agent and the structure throughout the dynamic process of TBE with an emphasis on learning. An in-depth case study allows capturing the structuration of TBE and the evolution of the firm's capabilities, which contributes to supporting analytic perspectives (Yin, 2003). It is also a means of contributing new insights that cannot be fully interpreted under the lens of the existing theory (Eisenhardt & Graebner, 2007). The research setting is ITAC, a firm created as a TBE in the software industry of an emerging country, which has quickly grown during its first decade, becoming a successful international medium-sized company. The case is approached as an entrepreneurship where the knowledge base of the entrepreneur evolves through individual and collective learning. This learning process accounts for a co-evolution between technical skills and routines related to software engineering along with commercial, managerial and strategic capabilities.

The rest of this article comprises first a conceptual review of the literature associated with (technology-based) entrepreneurship, as well as structuration theory, and entrepreneurial learning from a collective and dynamic point of view. Then, the underpinnings and the methodological design of the study are discussed in order to follow up with an account of the most relevant results and most significant moments of the firm plotted on a historical development timeline. Finally, there is a discussion of the results and implications in terms of the sustainability of technical and commercial growth in software startups.

LITERATURE REVIEW

This section covers several related theoretical approaches to technology-based entrepreneurship, including its conception as well as its evolution.

(Technology-Based) Entrepreneurship

The dominating conception of the contemporary entrepreneur is still strongly influenced by the image of the heroic entrepreneur from the industrial revolution, whose projects are huge and whose characteristics and energy are outstanding (Ricketts, 2008). This notion was solidified and became seminal in Schumpeter's initial work, which distinguishes the normal manager (resource configurator) from the manager that has an outstanding entrepreneurial spirit. In this early Schumpeter (1934), the link between the entrepreneur and innovation as a competition driver is dealt with for the first time