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Managing robust development process for high-tech startups through multi-project learning: The case of two European start-ups

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Abstract

This paper explores the question of managing start-up development through a succession of exploration projects. Learning efficiency then appears a key success factor in this context. We propose theoretical insights as empirical material to understand the organizational mechanisms of such project-learning-based development in high-tech start-up context. On the theoretical side, we articulate three bodies of knowledge: project management, organizational learning, and entrepreneurship. The result is an analytical framework to characterize such development in term of multi-projects management and organizational settings.

On the empirical side, we analyze two contrasted case studies. The discussion helps to provide patterns to diagnose maturity level and robustness of new ventures in their development.

Keywords: Entrepreneurship; Learning; Projects; Effectuation

1. Introduction

The purpose of this paper is to explore the question of managing start-up development in a high-tech context through multi-project learning. Technology firms are usually founded on a product and market idea that will guide their development. The early definition, even before the firm's creation, of such idea is seen as an important success factor. Early choice, however, limits firms' flexibility; as a result, they are particularly sensitive to disruptions and turbulence that will undermine the relevance of the chosen target: every discontinuity generates erratic trajectory, if not simply death. Continuous routes from initial product-market concept to success, as exemplified by Compaq or Skype, are indeed exceptions. In many cases, the firm survives, and maintains its development as an "old start-up" through implementing a succession of new projects that redefine and/or complete the initial concept, valuing – if possible – the initial experience of the previous trials.

Learning efficiency appears then a key success factor in this context. If the projects are just a succession of independent trials and errors, the firm will rapidly exhaust its resources and fail. On the contrary, if the learning track provides an increasing return [1] of the explorations, the firm development will grow in robustness. How can such convergent multi-project learning occur and sustain a robust development of the start-up? How is this learning process related to key choices, in terms of the internal organization of the firm and its relations with its environment? These research questions are addressed in this paper.

In the first part, we will elaborate our theoretical framework by exploring literature on organizational learning and multi-project management. This framework will enable us to characterize multi-projects startup learning on one

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side, and their organizational structuring on the other. In the second part, we will present the two cases with our theoretical framework. In the third part, in line with the inductive perspective of the research, the results of the case comparison will lead to some hypotheses concerning the organizational mechanisms of project-learning-based robust development.

2. Materials and methods

The paper is inductive in nature and based on the longitudinal case studies of two French startups: WSoft (a pseudonym), a firm developing wireless software, and NewPicture (also a pseudonym), a firm specialized in digital cinema.

Data were collected through a two-year full-time presence in the companies. The analysis of research data consisted of within-case analysis, cross-case analysis and expert analysis. Our primary source of data for WSoft is the founder and CEO of the firm, who is part of the research team as a reflective practitioner [2]. For NewPicture, a case study has been elaborated as a result of the research [3]. As typical in qualitative research, the validity of our insights was checked with senior executives of each firm as well as with other academic members of the research team.

We chose these firms because, as small, new players in their respective markets, they exemplify the phenomenon of interest, i.e. how an entrepreneurial firm deals with high uncertainty in its attempt to establish itself as leader in its market.

This study contributes to the integration of concepts and theories by using the extended case method, which aims to integrate and synthesize existing bodies of work. In contrast to the grounded theory approach, the primary focus of the extended case study is not to build new theory. Rather, its method is to integrate and extend existing theories through an iterative process of traveling back and forth between the data, pertinent literature and emerging theory [4].

3. Theoretical framework

To explore our research questions, we articulate three theoretical fields: entrepreneurship theory, project based learning, and organizational theory (Fig. 1).

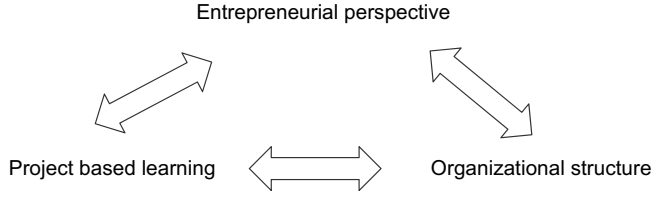

Fig. 1. Typology of organizational models, based on three dimensions [32].

3.1. The entrepreneurial perspective: planning vs. effectuation reasoning

Entrepreneurship theory has developed a classical, stage-based pattern for start-up development, which starts with an initial exploration stage leading to the opportunity recognition stage, where the market/product target is settled, and then thanks to a triggering event, to the exploitation phase after the firm is created [5].

In seeking to understand the key success variables for such a development, two elements have been identified as leading to a better identification of opportunities by entrepreneurs: prior knowledge and 'alertness' [6]. Shane [7] shows the importance of prior knowledge to find opportunities. However, he does not explain how this knowledge is acquired. Kirzner [8] uses the term 'alertness' to explain entrepreneurial ability to recognize opportunities, and suggests that higher alertness increases the likelihood of an opportunity being recognized. Similarly, we do not know why some entrepreneurs are more alert than others. A review of the literature shows that the relationship between opportunity identification and personality traits seems to be weak [9]. If alertness is not a trait, then it might be a condition that results from what the entrepreneur has done that others have not, rather than what he or she is, i.e., that alertness and knowledge are path-dependent. Crossan et al. [10] recognize the interactive relationship between cognition and action by remarking that understanding guides action, but action also informs understanding.

On the empirical side, many studies have demonstrated the non-linear and often chaotic profiles of start-up development. In an extensive literature review, Lichtenstein et al. [11] conclude that the stage model, linear pattern for understanding start-up development is a theoretical dead-end. They call for more complex, non-linear sequences, introducing feed-back driven patterns, unpredicted events, heavy interactions between internal and external factors, etc. But as they have a descriptive empirical capacity to map all the possible start-up trajectories, such models are too general to have fruitful operational implications for managing such trajectories.

Another stream in the entrepreneurship field has precisely studied how entrepreneurs deal with a situation of pure, Knightian [12] uncertainty. Sarasvathy [13] showed that entrepreneurs invert the principles of causal reasoning, and that the inversions together constitute a comprehensive new logic that she calls "Effectuation". Effectuation is a sequence of non-predictive strategies in dynamic problem solving that is primarily means-driven, where goals emerge as a consequence of stakeholder commitments rather than vice versa [13]. An alternative to causal rationality (the basis of planning), effectuation suggests that "Knightian" actors succeed by taking a progressive approach to the definition of their products and markets [14]. What matters, therefore, is not which products and markets they choose ex-ante, but how, in the absence of current markets for future products, such products get created by the firm