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Fostering entrepreneurial learning processes through Dynamic Start-up business model simulators

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ABSTRACT

Entrepreneurial learning is a critical process in realizing the success or failure of a new business venture, as it implies that would-be entrepreneurs acquire those strategic management competencies required to start and manage a new business. Actually, statistics on start-up survival/failure rate reveal that the main reasons for failure are related to a lack of entrepreneurial competencies of start-uppers.

This paper argues that combining Business Model representation schemas with System Dynamics modelling may support potential start-up entrepreneurs in learning and experimenting how to turn a business idea into a real firm. System Dynamics modelling is a methodology that allows us to elicit would-be entrepreneurs' mental models underlying the ways to start and set up the strategic architecture of a nascent business, as well as to learn essential strategic management principles by exploring – through the use of simulation – alternative strategic choices and associated scenarios within a protected interactive learning environment. As such, a 'Dynamic Business Modelling' approach may offer useful insights to start-up entrepreneurs by capturing, explaining and simulating how critical business model elements interact to produce enduring competitive advantages over time.

1. Introduction

According to the US Bureau of Labour Statistics,[1] about 40% of start-up firms fail in the first four years of their life. Cressy (1999) supports that this dynamic, which is surprisingly stable over time, can be mainly explained by the characteristics of human capital (see also Bates, 1990; Peña, 2002; Dickson, Solomon, & Weaver, 2008). A recent study from the University of Tennessee[2] outlines that the leading causes of business failures are "incompetence" (in the 46% of cases) – i.e., lack of strategic planning, emotional approach to pricing, non-payment of taxes, no knowledge of industry pricing conventions, no knowledge of financing requirements and conventions, no experience in record-keeping, living beyond the means of the business – and a "lack of managerial experience" (in the 30% of cases) – i.e., a too rapid expansion, stunted growth, inadequate borrowing practices, poor credit granting practices.

In this perspective, some authors identify the role of learning in the process of business evolution as one of the main driver determining business failure (Jovanovic, 1982; Peña, 2002). According to Peña (2002), from the moment the firm is created,

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[1] https://www.bls.gov/bdm/entrepreneurship/bdm_chart3.htm accessed on 26/02/2018.

[2] Entrepreneur Weekly, Small Business Development Center, Bradley Univ, University of Tennessee Research. Data available at http://www.statisticbrain.com/startup-failure-by-industry/accessed on 10/06/2017.

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entrepreneurs are exposed to a learning process whose knowledge and matured experience constitute a fundamental intangible asset which will influence the survival and growth of the start-up. Thus, starting a new business venture requires would-be entrepreneurs to understand and explore how to create an organized business structure around such an idea, as well to investigate how it may become profitable and sustainable over time. Brilliant ideas often emerge from the perception of uncovered market needs or new market opportunities by people unfamiliar with basic strategic management principles and concepts. As a result, they frequently miss the opportunity to fully exploit their ideas and launch the related products/services to satisfy the novel human needs identified.

With the intent to learn how to formalize and develop a new business idea and its strategic architecture, nascent entrepreneurs may find support in the use of strategy-tools. As recommended by academic incubators and venture capital associations worldwide, the key-tool to formalizing and developing business ideas is the Business Model (BM), i.e. a framework that designs the strategic and organizational architecture of a nascent business and the way through which value creation processes lead to revenues (Fiet & Patel, 2008; Massa, Tucci, & Afuah, 2016; Morris, Schindehutte, & Allen, 2005; Zott, Amit, & Massa, 2011). In this study, BMs are intended as formal conceptual representations of how an organization functions and creates value. These representations aim at simplifying the entrepreneurial cognition of a business system.

In this perspective, BMs are viewed as explicit cognitive artifacts formalized in graphical, mathematical, or symbolic frameworks (Massa et al., 2016). The adoption of formal conceptual representations is particularly valuable for understanding and framing the complexity of BMs by making explicit the entrepreneur's mental model - i.e. the assumptions, generalizations, and representations that influence how people understand the world and take action (Senge, 1990). These representations can be used to articulate, challenge, transfer, and recombine the tacit knowledge at the background of implicitly understood cognitive schemas, heuristics, narratives and other organizationally embedded manifestations of BMs (Chesbrough, 2010; Massa et al., 2016). As such, BMs are designed as structured frameworks aimed at organizing managerial understandings about the design of firms' value creation processes (Martins, Rindova, & Greenbaum, 2015), as well as exploring their implications in terms of organizational performance and sustainability (Amit & Zott, 2012; Bocken, Short, Rana, & Evans, 2014; Boons & Lüdeke-Freund, 2013; Casadesus-Masanell & Ricart, 2010; Demil & Lecocq, 2010; Osterwalder & Pigneur, 2010; Zott & Amit, 2008). A business can be considered well-performing and sustainable if the products/services it offers better satisfy customer needs through the development and refinement of its distinctive competencies. These competencies must be related to the critical success factors of its market (or niche), and aim to provide the business with an enduring competitive advantage.

The search and identification of sustainable sources for competitive advantages is a complex task, particularly for new business ventures. In fact, while incumbent firms with a well-defined BM are mostly called to innovate it through a fine-tuning process oriented to benefit from new market opportunities and/or strategy re-formulation, start-up firms – often lacking of an appropriate entrepreneurial experience – need to design and implement their core business logic from the outset, under a deeper uncertainty related to the entrepreneurial risk they are engaging in (Alvarez & Barney, 2005; McMullen & Shepherd, 2006; Reymen et al., 2015; Sarasvathy, 2001). Actually, critical issues – such as the entity of funding, product pricing, making decisions about acquiring and coordinating resources, and so on – increase the level of uncertainty and complexity underlying entrepreneurial venturing. This uncertainty also refers to the fast speed of technological innovation that, together with a global-scale competition, makes the achievement of competitive advantages harder (Pisano, Pironti, & Rieple, 2015).

As Wrigley and Straker (2016) assert, in uncertain, complex and fast-moving environments, both product and process development essential for designing new BMs increasingly benefits from a combination of novel insights, rapid experimentation, and evolutionary entrepreneurial learning. Therefore, as well Andries, Debackere, and Van Looy (2013) argue, new firms need to be more adaptive and responsive to organizational and contextual changes by engaging in BM experimentation as a core competency for gaining sustainable competitive advantages.

Though drawn up with attractive insights, conventional BM representation frameworks (e.g., the Business Model Canvas) basically list and organize into specific sectors the main business elements (e.g., strategic resources, customer segment, cost structure, revenue streams, and so on). As such, they are designed to provide a *static* perspective of how the firm operates and creates value (Shepherd, 2015). Although it allows potential entrepreneurs to frame the core business elements according to their mental model, this prevents them from exploring the dynamic complexity of business sectors, experimenting and learning how the business reacts to strategic changes.

In this paper, we argue that combining conventional BM representation schemas with System Dynamics (SD) modelling may result in a strategy simulation-based tool able to feed up the strategic learning processes of would-be entrepreneurs (Cope, 2003, 2005; Minniti & Bygrave, 2001). The methodological support provided by simulation-based techniques – such as SD – is particularly recommended to model and analyse social systems characterized by dynamic complexity and uncertainty, as well as experiment with the models to design strategies for management and change (Forrester, 1961; Bianchi, 2016; Cosenz & Noto, 2016; Warren, 2008; Sterman, 1994, 2014).

Such an approach allows business modellers to coherently integrating strategic, economic, organizational, and social concerns into a holistic view of a start-up BM. In addition, the possibility to experiment with different scenarios and strategic initiatives by using simulation techniques has the potential to contribute in speeding up entrepreneurial learning processes by identifying those strategic levers and business key-elements on which to act in order to understand how the business reacts in terms of both profitability and sustainability. The main motivation for building start-up BM simulators is to bring a deeper understanding of how to create and develop new business ventures into university and professional education.

For this purpose, we initially provide an overview of SD modelling and its applications to entrepreneurship and strategic management with a focus on its relevance to BM research advances. Then, an analysis oriented to explain how to combine BM and SD modelling is conducted. This leads to the introduction of start-up BM simulators as entrepreneurial learning tools (Martins, 2017). To