

Lean Startup and the business model: Experimenting for novelty and impact



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ABSTRACT

Lean Startup has been impacting how startups and incumbents innovate their business models. However, academic understanding of Lean Startup and the associated experimentation process is only emerging. Recent academic critique of Lean Startup by Felin and colleagues (in press) highlights the inadequate guidance provided for hypotheses generation; limits of experiential learning from customer feedback; and the incremental nature of experimentation outcomes. Yet, Lean Startup has not been conceived for ideation, but rather for fostering iterative experimentation to reduce uncertainty, engage stakeholders, and promote collective learning. Taking a process perspective on experimentation, we suggest that novel business models can emerge during experimentation. We contribute a more positive perspective on the opportunities of Lean Startup and highlight how it can enable continuous innovation and stakeholder engagement for novelty and impact.

Introduction

There is growing interest in business experimentation in the management literature and practice (Chesbrough, 2010; McGrath, 2010; Felin et al., in press). With the support of popular management books (e.g. Blank, 2013a; Osterwalder et al., 2014; Ries, 2011), experimentation has become widespread to test novel business models¹ (Andries et al., 2013; Camuffo et al., 2019; McDonald and Eisenhardt, 2019). Business experiments² allow entrepreneurs to generate and test hypotheses about novel business models, fostering data analysis, followed by further actions such as additional experimentation, scale-up, or pivoting (e.g., Leatherbee and Katila, 2019; McDonald and Gao, 2019). Although experimentation inspired by Lean Startup has become prevalent (Blank, 2013b; Ries, 2011, 2017), academic understanding of the topic is only nascent, particularly in the context of generating societal impact (Antikainen et al., 2017; Weissbrod and Bocken, 2017).

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¹ Novel business models refer to activity systems that include new activities and partners configured in a way that is unprecedented in comparison to the existing incumbents (Snihur and Zott, 2019).

² In contrast to natural science experiments, business experiments are less 'controlled' in a business environment, involving real customers and immediate business pressures (Weissbrod and Bocken, 2017). They are rather quasi-experiments, which lack typical experimental design aspects like a control group or randomization (Cook and Campbell, 1979).

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Business experimentation favors execution over planning, facilitated by hypothesis testing and “getting out of the building” to evaluate ideas with real customers (Blank, 2013a). The action-oriented, nimble, and often low-cost experimentation can help get ideas off the ground quickly and identify and entice the first group of customers. These features contribute to making experimentation not only appealing to startups, but also to incumbents seeking strategic renewal in dynamic environments (Bojovic et al., 2019; Cozzolino et al., 2018; Desyllas and Sako, 2013). Business experimentation inspired by the Lean Startup method (Ries, 2011, 2017), usually coupled with the Business Model Canvas (Osterwalder and Pigneur, 2010), has diffused in both established companies and entrepreneurship classes, programs, and incubators (Felin et al., in press). While proponents praise experimentation for its potential to de-risk novel business model development in a low-cost way (McDonald and Eisenhardt, 2019; McGrath, 2010), critics point to the inadequate guidance about how to generate hypotheses for experimentation; limits of experiential learning from customer feedback; and the incremental nature of experimentation outcomes (Felin et al., in press).

While we agree that the Lean Startup is not a panacea for entrepreneurial challenges, in this essay we highlight in which instances it can be beneficial, namely to generate novelty (i.e., more radical innovations) and impact (i.e., economic, societal, and environmental impact). In response to the critique by Felin et al. (in press), we emphasize the potential of Lean Startup to bring about novel and impactful business models. We explain that this is possible due to the generative nature of experimentation when viewed through a process lens (Burgelman et al., 2018; Langley et al., 2013; Pettigrew, 1992), and discuss the affordances experimenting provides to tackle the grand challenges in terms of societal and environmental problems we are facing. We synthesize the opportunities related to the use of the Lean Startup method in startups and incumbent firms and suggest directions for future research to advance the cumulative knowledge about business experimentation, particularly in the context of social and environmental sustainability.

Felin et al. (in press) critique of Lean Startup

Felin et al. (in press) provide three main critiques of Lean Startup. First, Felin and colleagues critique Lean Startup and the Business Model Canvas, often used in conjunction with Lean Startup, for lacking specificity to help entrepreneurs generate unique targeted hypotheses and critical experiments to test theories, and for providing them with little guidance on “what to look for in the first place” (Felin et al., in press, p. 3). This is because the Business Model Canvas broadly canvasses the environment in search for a “fully-fledged BM,” rather than solving the “first-order problem” of crafting and developing a unique theory of value from which hypotheses and experiments could be derived (Felin et al. in press, pp. 3–4).

Second, Felin et al. (in press, p. 1) criticize the Lean Startup’s heavy reliance on readily observable feedback and immediately validated learning. These features, Felin and colleagues claim, do not contribute to the entrepreneur’s task of composing novel theory and hypotheses, but rather prompt a search for value and validation where it is most observable. Lean Startup is, therefore, criticized for over-relying on the market feedback and the customer in particular. This is problematic, they argue, because the customer does not necessarily have better knowledge than the startup founders, and it is unclear why observing or surveying customers would generate radically new products, services, or business models.

Third, although Felin et al. (in press, p. 2) admit that Lean Startup is not the same as lean manufacturing, they cite the Lean

Table 1
Summary of key responses to Felin et al. (in press).

Critiques of Lean Startup by Felin et al. (in press)	Responses in this article	Key arguments
<p>► Lean Startup, and its favored hypothesis-generating tool, business model canvas, lack “specificity in helping startups craft unique, targeted hypotheses and critical experiments for testing their theories” <i>(p. 2, see also Challenge #3 on pp. 3-4)</i></p>	<p>1. Lean Start-up and the Business Model Canvas are not tools conceived for ideation. For a graphical representation, see Figure 1.</p>	<p>1a. Lean Startup and the tools typically associated with the Lean Startup such as the Business Model Canvas are not well-suited for the creative activity of generating novel business model ideas (i.e., ideation) during the innovation process.</p> <p>1b. They rather have merit for the <i>subsequent</i> activity of experiment design and testing during the innovation process (see Figure 1).</p>
<p>► Lean Startup relies heavily on readily observable customer feedback and immediately validated learning, which “undersells the entrepreneurial scientist’s central task of composing a novel theory and hypotheses, prompting instead a search for value and validation only where it is easy to observe it” <i>(p. 1, see also Challenge #2 on pp. 2-3)</i></p>	<p>2. Lean Startup promotes experimentation as an iterative process to reduce uncertainty, engage stakeholders, and promote collective learning at a relatively low cost</p>	<p>2a. Entrepreneurs need to test their assumptions <i>before</i> committing to an often costly implementation. This is particularly fundamental in cases of high novelty.</p> <p>2b. Entrepreneurs need to fine-tune and update hypotheses about unique value creation, which is best realized collectively with different stakeholders (customers included) to achieve high novelty and impact at a relatively low cost.</p> <p>2c. Experimentation has additional benefits in terms of reducing inertia and spurring continuous innovation in organizations.</p>
<p>► Lean Startup “promotes incremental experiments that, more often than not, only generate incremental value” <i>(p. 1, see also Challenge #1 on p.2)</i></p>	<p>3. Lean Startup is not (and should not be) associated with incrementalism</p>	<p>3a. The initial business-model idea can be incremental or radical, which is independent of using the Lean Startup method.</p> <p>3b. Radical innovation can result from serendipity during experimentation.</p> <p>3c. Gradual incremental innovation processes might eventually give rise to radical innovation.</p>

Startup's origins in lean manufacturing, focused on continuous, incremental change, as the root-cause problem limiting Lean Startup's potential for the generation of novel and impactful business models. Table 1 summarizes the key critiques by Felin and colleagues and showcases our responses, which we detail next.

Response 1: Lean Start-up and the Business Model Canvas are not tools conceived for ideation

As an entrepreneur experienced with failure, Eric Ries developed the Lean Startup following interactions with investor and advisor Steve Blank who in the early 2000s was advocating for an equally rigorous process for the business and marketing functions of a startup as was already the case for engineering and product design (Ries, 2011, p. 5). Searching for inspiration on “rigor,” Ries learned about lean manufacturing principles, focused on a rigorous process of continuous improvement, and started to apply lean principles of manufacturing to processes of innovation (Ries, 2011, p. 6). Yet, the intentions are quite different: increasing efficiencies for lean manufacturing versus promoting learning and reducing uncertainty about the viability of the business model for Lean Startup.

Felin and colleagues critique the Lean Startup for the lack of guidance on generating unique hypotheses and “what to look for in the first place” (Felin et al., in press, p. 3). We agree that Lean Startup lacks guidance for the initial ideation phase of the innovation process and posit that it is not meant to be applied for the inception of the vision or business model (innovation) ideas. It is rather conceived as a tool for the rigorous and continuous experiment design and testing of the assumptions underlying these ideas (see Fig. 1). In our view, the Lean Startup is thus not suited as an ideation tool to generate the first-order ideas Felin et al. (in press, pp. 3–4) refer to, but was rather developed as a tool for the subsequent activity of experiment design and testing. Fig. 1 graphically illustrates our interpretation based on Ries (2011) of where and how the Lean Start-up is positioned, that is after the entrepreneurs had formed their vision and initial business model idea(s).

Many new businesses start with a vision and goal and some initial ideas in particular in the area of sustainability (Brown et al., 2019; Stubbs and Cocklin, 2008; Yunus et al., 2010), where innovators seek to tackle grand challenges, such as climate change and poverty. These entrepreneurs might already have strong visions and associated values anchored in their individual identities, beliefs, and ideologies, which are often difficult to change (Fauchart and Gruber, 2011; Grimes, 2018; Perkmann and Spicer, 2014). Relatedly, existing empirical work on experimentation confirms that entrepreneurs usually experiment with higher frequency on the peripheral rather than on the core dimensions of their business models (Nicholls-Nixon et al., 2000).

Further, a number of tools exist that can help in the initial creative activity of ideation, including brainstorming, distant search, analogies, etc. (e.g., see Berends et al., 2016; Martins et al., 2015). While the former tools are useful for ideation, research suggests that tools such as the Business Model Canvas in fact reduce creativity due to their analytic nature and predefined elements (i.e., nine blocks in the Business Model Canvas). For example, existing knowledge about industry functioning and the structural features of the Business Model Canvas limited creativity of engineers who worked on developing novel business models in the aerospace sector (Snihur et al., 2019).

In sum, while we agree with Felin et al. (in press) that Lean Startup and the tools typically associated with the Lean Startup such as the Business Model Canvas are not well-suited for the creative activity of generating a novel business model idea (i.e., ideation), we argue that they have merit for the subsequent activity of experiment design and testing during the innovation process (see Fig. 1).

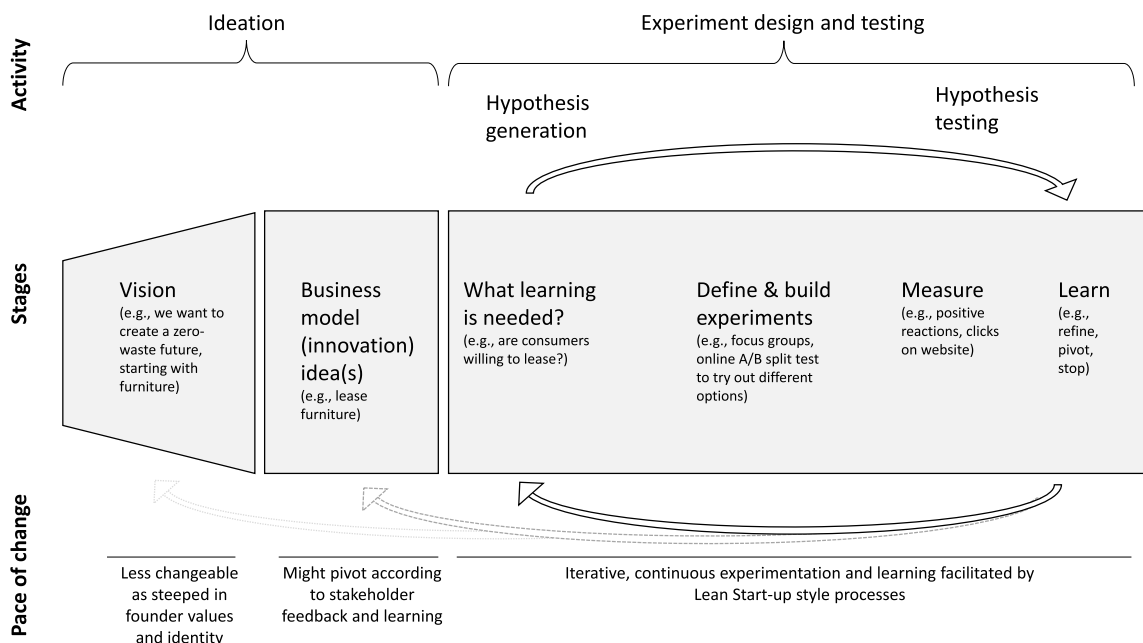


Fig. 1. Business model development process, experimentation, and Lean Start-up in practice, building on Ries (2011).

Response 2: Lean Startup promotes experimentation as an iterative process to reduce uncertainty, engage stakeholders, and promote collective learning at a relatively low cost

One of the other main critiques by Felin and colleagues relates to over-relying on the customer, who does not necessarily have better knowledge than the startup founders. It is also not clear according to Felin et al. (in press, pp. 2–3) why observing or surveying customers would help generate *radically* new products, services, or business models.

We argue that Lean Startup method triggers an iterative experimentation process to reduce uncertainty, engage stakeholders, and promote collective learning at a relatively low cost. This is important for three reasons: (a) entrepreneurs need to test their assumptions *before* committing to often costly implementation, particularly fundamental in cases of high novelty, (b) hypotheses about unique value creation need fine-tuning and updating best realized *collectively* with different stakeholders (customers included) to achieve high novelty and impact, and (c) experimentation can reduce inertia and spur *continuous* innovation in organizations.

First, there are various benefits associated with being “lean,” not the least of them ensuring relatively low costs of the innovation process and avoiding unnecessary investments. This was one of the reasons Ries started to work on his 2011 book. Early commitment (without experimentation) to unrealistic theory and associated beliefs by entrepreneurs has been shown to lead to big failures. For example, Zuzul and Tripsas (2019) suggest that entrepreneurs who strongly commit to their original idea might be less successful than entrepreneurs who continuously update their business model. Their study, along with other examples such as the spectacular WebVan failure in 1990s (Navis and Ozbek, 2016) or the BetterPlace bankruptcy in 2010s (Martins et al., 2015) suggest that committed entrepreneurs with a theory of unique value (i.e., specific business model choices) might run the risk of over-committing too quickly to a vision that is too distant from reality, destroying value for their employees, investors, and customers in the process. Thus, entrepreneurs need to test assumptions, particularly the ones underlying their highly novel ideas, before implementation and scaling.³

Second, hypotheses for unique value creation—particularly for high novelty and impact—rarely emerge fully-formed but require fine-tuning and updating through learning about possible futures based on deliberate small-scale and low-cost probes and tests (Bingham and Davis, 2012; Brown and Eisenhardt, 1997). Entrepreneurs usually carry on revising business models through interactions with various stakeholders, a process that often continues over significant periods of time (Garud et al., 2014; O'Connor, 2002; Snihur et al., 2018). Research on entrepreneurial processes such as experimentation (McDonald and Eisenhardt, 2019), continuous morphing (Rindova and Kotha, 2001), or pivoting (Grimes, 2018; McDonald and Gao, 2019), suggests that entrepreneurs rarely start with a well-formed business model idea, but it rather involves arduous and iterative experimentation (Autio et al., 2018; Sosna et al., 2010).

Research on the business model development process confirms that experimentation enables learning (Cosenz and Noto, 2018; Leatherbee and Katila, 2019; McDonald and Eisenhardt, 2019), reduces uncertainty (Andries et al., 2013; McGrath, 2010), can help convince potential customers and other stakeholders, and legitimize the startup in its ecosystem (Bojovic et al., 2018). Experimentation processes enable engagement with customers, potential partners, and other ecosystem actors that help entrepreneurs shape their environment and co-construct a viable business model (Doganova and Eyquem-Renault, 2009). Lean Startup is not necessarily restricted to a narrow definition of a single homogenous customer, but, as Sarasvathy (2001, 2009) also recognizes, this customer may be formed as a “crazy quilt” of serendipitous stakeholders who cross the resource- and time-poor entrepreneur's path and can form the basis of joint experimentation and collective learning. Importantly, involving societal stakeholders in the experimentation process can strengthen the commitment to societal and environmental impact, next to meeting profit goals (Battilana et al., 2015; Yunus et al., 2010).

Third, recent academic research recognizes that business model experimentation can help overcome organizational inertia (Bojovic et al., 2019), drive renewal (Cozzolino et al., 2018), and spur continuous innovation (Berends et al., 2016; Desyllas and Sako, 2013; Khanagha et al., 2014). To start, the language of “experimenting” helps, as an “experiment” framing suggests the possibility of imperfection and creates affordances (Gibson, 1977) for creativity and learning (Bocken et al., 2017). For example, Bojovic et al. (2019) find that business model experimentation in a large European magazine publishing incumbent enabled the firm to change its entrenched organizational identity and engage in higher levels of digital innovation. Weissbrod and Bocken (2017) and Bocken et al. (2018b) investigated a large international clothing retailer aiming to reduce clothing waste using Lean Startup-type processes, and found that the process resulted in additional experimentation, opened up themes related to thorny business model innovation topics around clothing reuse, and led to the successful rollout of a novel business model.

Interestingly, these studies not only uncover the role of experimentation in incumbent firms, but also have in common a process perspective on incumbent adaptation to the evolving environment, concluding that experimentation and learning often combine in a virtuous cycle facilitating renewal. As Khanagha et al. (2014, p. 337) put it: “When the uncertainties inherent in a new business model make it impossible for managers to set firm plans, incumbent firms can make use of experimentation that enables learning and helps eliminate uncertainties.”

In sum, we argue that Lean Startup-spurred business experimentation helps to reduce uncertainty but also *collectively* create new meanings and co-construct new business models *with stakeholders* (not only with customers). Experimentation can therefore be viewed as a collective process conducive to unlocking the emergence of impactful novelty in organizations, an important strategic process facilitating entrepreneurial work in startups (McDonald and Eisenhardt, 2019) and strategic renewal in incumbent

³ As a disclaimer, some ideas cannot be tested quickly and cheaply when requiring upfront R&D investment, however paying attention to what assumptions underlying such ideas could be tested might still be useful.

organizations (Burgelman et al., 2018; Pettigrew, 1992). This is particularly important for grand and complex challenges we are facing, such as climate change, inequality, or poverty (Bocken et al., 2013; Yunus et al., 2010). Given the high risk of developing impactful novelty, it is important to test it in low-cost ways, which is facilitated by Lean Startup. Even if the result of such experimentation is a failure of the specific entrepreneur or intrapreneur, collective experimentation might still enable more efficient search for solutions to grand challenges when compared to lone entrepreneurs developing unique hypotheses.

Response 3: Lean Startup is not (and should not be) associated with incrementalism

A final point, reiterating and building on some of our former points, is that Lean Startup is not (and should not be) associated with incrementalism. We stress this point because Felin et al. (2019, pp. 1–2) argue that “Lean Startup promotes incremental experiments ... [that] generate incremental value” and creates a “mismatch as startups seek to compose radically discontinuous innovations.” In response, we argue that (a) the initial business model idea can be incremental or radical, which is independent of using the Lean Startup method (see Fig. 1); (b) radical innovation can result from serendipity during iterative experimentation, and (c) gradual incremental innovation process might eventually give rise to a radical innovation. These three arguments suggest that Lean Startup should not be associated with incrementalism.

First, entrepreneurs can apply Lean Startup to an originally incremental or radical idea (see dashed arrow in Fig. 1). As we argued above, Lean Startup is a method for hypothesis testing, not for generating the *initial* vision or business model idea. An experiment might lead to pivoting the business model to a new direction (e.g., Leatherbee and Katila, 2019) or to incrementally adjusting the original incremental or radical idea (e.g., Contigiani and Levinthal, 2019). Studies suggest that companies that developed novel business models, such as Salesforce that introduced a cloud-based subscription business model to the enterprise software market, did so through a process of experimentation and business model adjustments that were crucially important during their early years (Snihur et al., 2018). Thus, if the original hypothesis is radical, it is reasonable to suggest that Lean Startup could help test the underlying assumptions, yet still result in radical innovation, like in the cases of Salesforce (Snihur et al., 2018), Airbnb, or Dropbox (Ries, 2017). For instance, Ries, (2017, pp. 17–18) documents how Airbnb experimented with its peer-to-peer short-term rental model to further expand its already radical business model innovation and how the Dropbox founder experimented with the minimum viable product video of its online data storage to convince prospective investors before the radically new product had been fully developed (Ries, 2011, p. 97).

Second, several studies show that continuous experimentation can result in radical innovation through serendipitous events. Probably the most well-known example of this in science is the accidental discovery of penicillin by Fleming, who noticed that mold was killing staphylococcal bacteria with which he was experimenting. He then famously commented that one sometimes finds what one is not looking for. While the lack of radical innovation is portrayed as the unintended consequence of the Lean Startup by Felin et al. (in press), it is worth noting that there might be positive unintended consequences of experimentation. Consider the serendipitous discovery of a viable novel business model by PayPal. When originally founded in 1998, PayPal “enabled business executives to securely access their companies’ systems on PalmPilot digital assistant,” but after several experiments and customer feedback it changed course to enable “customers to send money via email,” which became a huge success (McDonald and Gao, 2019, p. 1). This is in line with the insights from the strategic process research on the importance of emergent processes in organizations (Burgelman et al., 2018), particularly for the generation of novelty.

Third, incremental innovation can eventually culminate in radical innovation as radical innovation becomes legitimized and embraced through a gradual change process (Berends et al., 2016; Girod and Whittington, 2015; Plowman et al., 2007). For example, Plowman et al. (2007) describe how a simple decision to offer breakfast to homeless people became amplified by resource commitments and skillful use of language and symbols, leading to systemwide fundamental changes in the organization’s outreach programs. In the context of business model experiments, Bocken et al. (2017; 2018b) find that continuous experimentation in a large clothing retailer generated “tangible real-life context evidence” that enabled business model innovation—focused on product life extension through sewing—which goes against the dominant fast fashion mindset. Similarly, when studying incremental business model innovation for sustainability, Laasch (2019, p. 422) suggests that the “dynamics of continuous incremental innovation” can manifest in more radical business model innovation. This may be explained through “a variety of underlying micro-processes of translation related to the reweaving the business model actor networks and activity system.” Here, translation activities relate to situations where one actor encounters another with a logic distinct from their own, which requires mutual explanations to reconcile the logics (Laasch, 2019, p. 422). An artifact (such as a textual-visual artifact focused on “Being Responsible” in Laasch, 2019), or an ambitious project goal (such as “to divert all clothing waste from landfill” in Weissbrod and Bocken, 2017), may serve as a change impetus paving the way to more radical and impactful innovation.

In sum, while the Lean Startup is definitely not a panacea for the challenges facing entrepreneurs that develop business models under conditions of high uncertainty and ambiguity, the recent emphasis on experimentation enabled by this method in practitioner literature and the increasing focus on experimentation in academic research (e.g., Camuffo et al., 2019; Leatherbee and Katila, 2019; McDonald and Eisenhardt, 2019) are very much needed to create value and impact through innovative solutions (Dentchev et al., 2018).

Opportunities for Lean Startup in the context of business model innovation for novelty and impact

Proponents commend the experimentation process Lean Startup triggers in organizations. When entrepreneurs conducted deliberate experiments, they were found to perform better, pivot to a greater extent to a new idea, and were less likely to dropout

compared to a control group, in the early stages of the startup process (Camuffo et al., 2019). Lean Startup-inspired experimentation can save time and resources, and limit wasted energy to get to the first customer (Blank, 2013b). To provide a more balanced portrayal of the Lean Startup method than currently allowed by the Felin et al. (in press) critique and anchored in the existing academic research and a process perspective on experimentation, we identify three opportunities for entrepreneurs seeking to innovate their business models, described below.

Opportunity #1. Lean Startup as an enabler for continuous experimentation process

Probably the biggest opportunity offered by the Lean Startup method is its enabling role to trigger a continuous experimentation process in organizations. Experimentation is particularly important in the context of grand challenges such as climate change (Ansari et al., 2013) and poverty reduction (Battilana and Dorado, 2010; Yunus et al., 2010), for which simple solutions are not obvious ex ante. As Ferraro et al. (2015, p. 377) argue, a focus on small wins, iteration, repetition, and continuous learning can “help maintain engagement and pursue additional experimentation.” While of course not all businesses applying the Lean Startup method will find viable solutions and novel business models, collective experimentation is likely to generate an increased number of viable solutions at the societal level (Yunus et al., 2010). Further, both successful and failed experiments might help identify additional problems and concerns, producing deeper knowledge and providing further ideas for solutions not only within specific companies but also across industries and ecosystems due to spillover effects (Autio et al., 2018; McGrath, 2010). This suggests that the experimentation process has both direct benefits in terms of learning (Contigiani and Levinthal, 2019) and indirect benefits in terms of stimulating additional (and hopefully cumulative) experimentation and increasing the absorptive capacity and openness of firms engaged in experimentation, which is particularly important in the sustainability context (Weissbrod, 2019; Weissbrod and Bocken, 2017).

The experimentation process involves generating small wins and promoting quick learning from failure. This allows entrepreneurs to abandon unsuccessful efforts quickly and start over with a new direction. This is of value in a sustainability context, which requires trial and error to start answering the wicked challenges such as climate change and poverty, which lack definitive solutions or endpoints but need an urgent response (Rittel and Webber, 1974). Business experimentation can get businesses out of their comfort zone to start tackling such urgent challenges and try to effectively reconcile business, environmental, and societal goals (Hart and Milstein, 2003). The continuous low-cost nature of experimentation fits the nature of sustainability issues. This is also useful in the context of incumbents that might be hesitant or unwilling to commit significant resources to unproven new (or even radical) initiatives.

Opportunity #2. Lean Startup as an enabler of novel and impactful business models developed together with internal and external stakeholders

Research on innovation and entrepreneurship suggests that engagement of various stakeholders, such as customers, partners, as well as regulators, is beneficial, especially early on in the innovation process (Garud and Karnøe, 2003; Garud et al., 2014; Snihur et al., 2017). The reason is that early feedback from and iteration with various stakeholders, also recognized in design science (Baldassarre et al., 2017; Osterwalder, 2004; Thomke, 1998), can help entrepreneurs to rethink, reframe, and transform their vision and the underlying business model. This is particularly important when handling global societal and environmental challenges such as rising inequality, poverty reduction, or climate change given the complexity of issues and different stakeholders involved (e.g., Ansari et al., 2013; Battilana and Dorado, 2010; Ferraro et al., 2015). The advantage of the Lean Startup method in this context is its emphasis on feedback loops taking explicitly into consideration stakeholder evaluations and expectations as early as possible. Further, the participation of multiple stakeholder groups in the increasingly more open experimentation process can help increase novelty emergence and provide solutions to the incremental innovation trap Lean Startup method has been criticized for (Felin et al., in press).

One of the key strengths of Lean Startup thus appears to be the early interaction and testing with real customers (Blank, 2013b; Ries, 2011), and other stakeholders. Early stakeholder testing can save money, time, and organizational resources. In business models for sustainability, the early interaction with societal stakeholders can also help companies to retain their social and environmental mission (Yunus et al., 2010). By having a stake in the success, external partners can also act as collaborating partners in launching the new business model (Kraaijenhagen et al., 2016). Finally, business experimentation can support internal transitions by creating tangible evidence for managers and employees inside organizations (Weissbrod and Bocken, 2017). This has also been shown to impact organizational identity by creating new aspirations and facilitating organizational renewal (Bojovic et al., 2019).

Opportunity #3. Lean Startup integration with other decision-making approaches

Entrepreneurs need guidance about how to translate promising ideas and cues from the external environment into viable business models (Tece, 2018). Felin et al. (in press) critique the prominent use of the Business Model Canvas (Osterwalder and Pigneur, 2010; Osterwalder et al., 2014) in conjunction with the Lean Startup method for the lack of advice about how to develop appropriate assumptions and hypotheses. The Business Model Canvas has also been criticized for other reasons, such as not deliberately addressing societal and environmental issues during novel business model development (Bocken et al., 2013; Joyce and Paquin, 2016; Upward and Jones, 2016; Lüdeke-Freund et al., 2016) or inhibiting creativity (Snihur et al., 2019).

We agree with Felin et al. (in press) that better tools are needed to support entrepreneurs in developing hypotheses about the novel business models. Existing tools such as the use of analogical reasoning (Martins et al., 2015), alternative framing of problems (Garbuio et al., 2018), or industry-spanning distant search (Snihur and Zott, 2019) can be helpful for increasing novelty. Further,

current sustainability tools include modifications of the Business Model Canvas (e.g. Triple Bottom Line Canvas; Joyce and Paquin, 2016, or Flourishing Canvas; Upward and Jones, 2016) and various creativity-enhancing tools such as mapping tools to develop sustainable value propositions (Bocken et al., 2013; Nussholz, 2018), and games (Whalen et al., 2018). However, case studies suggest that it is difficult to retain the sustainability focus throughout the experimentation process (Manninen et al., 2018; Weissbrod and Bocken, 2017). Improvements in tools and methods are still needed to support business experimentation for novelty and impact.

Implications and conclusion

By viewing experimentation as an important strategic organizing process (Langley et al., 2013; Pettigrew, 1992) that creates affordances for innovation (Autio et al., 2018), we suggest that Lean Startup might help organizations tackle grand challenges related to societal and environmental concerns. We see sufficient merit and inspiration in the Lean Startup-anchored experimentation to vouch for its suitability in both startup and incumbent businesses as a way to gain traction for novel and impactful business models. Notably, internal excitement about “real evidence” and positive impetus generated by experimentation can inspire internal change to respond to increasing competitive threats (Bojovic et al., 2019; Cozzolino et al., 2018) and business-led sustainability transition requirements (Bocken et al., 2018a; Weissbrod and Bocken, 2017). Creating external traction and continuously engaging stakeholders is also crucial. Once companies start to develop the business model through experimentation with customers, partners, and societal stakeholders, the business model can be iteratively built up through this joint co-creation process, embedding interests and objectives from different stakeholders into the business model (Geradts et al., 2019; Kraaijenhagen et al., 2016; Yunus et al., 2010).

Undeniably, more research is required to understand the process of experimentation with novel and impactful business models. First, what are the boundary conditions under which experimentation process can produce useful outcomes in terms of high novelty and/or impact for startups or incumbent firms? Second, we need to know more about the details of the process itself, such as content, sequencing, types of participants, pace, and rhythm. For instance, how should entrepreneurs or managers decide on which assumptions to test first? Who should be responsible for experimentation, and how many actors in the business (and other stakeholders) should ideally be involved, how intensively, at what intervals, and for how long? How can effectual logic be combined with the more structured Lean Startup method? Third, how can environmental and societal goals be tested in parallel to commercial goals? Related to this, how can the long-term effects of a business model (economic, social, environmental) be anticipated, if at all? Finally, after multiple experiments, how can the company move from experimentation to scaling up the business model? These are all sources of inspiration for future research.

Flourishing academic literature on business models and business model innovation has repeatedly shown that novel unique business models are related to high performance of both startups (Zott and Amit, 2007) and incumbents in various industries and countries (Pati et al., 2018), further suggesting that business model innovation might enable renewal of incumbents (Bojovic et al., 2019; Cozzolino et al., 2018). In agreement with Felin et al. (in press), this stream of research clearly suggests that a search for novelty is important. Today, such novelty also involves businesses reacting to the grand challenges including rising inequality and deteriorating natural environment through novel business models. Indeed, business model innovation is increasingly regarded as a lever to address exacerbating sustainability challenges (Dentchev et al., 2018; Yunus et al., 2010). Lean Startup offers an important advance to help companies design business models for novelty and impact. The study of these processes offers exciting opportunities for further much needed relevant research.

Author statements

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Declaration of competing interest

None.

References

- Andries, P., Debackere, K., van Looy, B., 2013. Simultaneous experimentation as a learning strategy: business model development under uncertainty. *Strateg. Entrep. J.* 7 (4), 288–310.
- Ansari, S., Wijen, F., Gray, B., 2013. Constructing a climate change logic: an institutional perspective on the “tragedy of the commons.”. *Organ. Sci.* 24 (4), 1014–1040.
- Antikainen, M., Aminoff, A., Paloheimo, H., Kettunen, O., 2017. Designing circular business model experimentation- Case study. In: *The Proceedings of the 2017 ISPIM Forum*, Toronto, Canada, 19-22 March 2017. 978-952-335-019-9, .
- Autio, E., Nambisan, S., Thomas, L.D., Wright, M., 2018. Digital affordances, spatial affordances, and the genesis of entrepreneurial ecosystems. *Strateg. Entrep. J.* 12 (1), 72–95.
- Baldassarre, B., Calabretta, G., Bocken, N.M.P., Jaskiewicz, T., 2017. Bridging sustainable business model innovation and user-driven innovation: a process for sustainable value proposition design. *J. Clean. Prod.* 147, 175–186.
- Battilana, J., Dorado, S., 2010. Building sustainable hybrid organizations: the case of commercial microfinance organizations. *Acad. Manag. J.* 53 (6), 1419–1440.
- Battilana, J., Sengul, M., Pache, A.C., Model, J., 2015. Harnessing productive tensions in hybrid organizations: the case of work integration social enterprises. *Acad.*

- Manag. J. 58 (6), 1658–1685.
- Berends, H., Smits, A., Reymen, I., Podoyntsyna, K., 2016. Learning while (re) configuring: business model innovation processes in established firms. *Strateg. Organ.* 14 (3), 181–219.
- Bingham, C.B., Davis, J.P., 2012. Learning sequences: their existence, effect, and evolution. *Acad. Manag. J.* 55 (3), 611–641.
- Blank, S., 2013a. *The Four Steps to the Epiphany: Successful Strategies for Products that Win*, first ed. 2005. K&S Ranch Publishing, San Francisco, USA.
- Blank, S., 2013b. Why the lean start-up changes everything. *Harv. Bus. Rev.* 91 (5), 63–72.
- Bocken, N.M., Miller, K., Weissbrod, I., Holgado, M., Evans, S., 2017. Business model experimentation for circularity: driving sustainability in a large international clothing retailer. *Econ. Policy Energy Environ.* 1–2, 85–122.
- Bocken, N., Schuit, C., Kraaijenhagen, K., 2018a. Experimenting with a circular business model: lessons from eight cases. *Environ. Innov. Soc. Transit.* 28, 79–95.
- Bocken, N., Short, S., Rana, P., Evans, S., 2013. A value mapping tool for sustainable business modelling. *Corp. Govern.* 13, 482–497.
- Bocken, N.M.P., Weissbrod, I., Miller, K., Holgado, M., Evans, S., 2018b. Slowing resource loops in the clothing industry through circular business model experimentation. In: Niinimäki, K. (Ed.), *Sustainable Fashion in a Circular Economy*. Aalto University School of Arts, Design and Architecture, Aalto, pp. 152–169.
- Bojovic, N., Genet, C., Sabatier, V., 2018. Learning, signaling, and convincing: the role of experimentation in the business modeling process. *Long. Range Plan.* 51 (1), 141–157.
- Bojovic, N., Sabatier, V., Coblence, E., 2019. *Becoming through Doing: How Experimental Spaces Enable Organizational Identity Work*. Strategic Organization, forthcoming.
- Brown, P., Bocken, N., Balkenende, R., 2019. Why do companies pursue collaborative circular oriented innovation? *Sustainability* 11 (3), 635.
- Brown, S.L., Eisenhardt, K.M., 1997. The art of continuous change: linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Adm. Sci. Q.* 1–34.
- Burgelman, R.A., Floyd, S.W., Laamanen, T., Mantere, S., Vaara, E., Whittington, R., 2018. Strategy processes and practices: dialogues and intersections. *Strateg. Manag. J.* 39 (3), 531–558.
- Camuffo, A., Cordova, A., Gambardella, A., Spina, C., 2019. A scientific approach to entrepreneurial decision making: evidence from a randomized control trial. *Manag. Sci* (forthcoming).
- Chesbrough, H., 2010. Business model innovation: opportunities and barriers. *Long. Range Plan.* 43 (2–3), 354–363.
- Contigiani, A., Levinthal, D.A., 2019. Situating the construct of lean start-up: adjacent conversations and possible future directions. *Ind. Corp. Chang.* 28 (3), 551–564.
- Cook, T.D., Campbell, D.T., 1979. The design and conduct of true experiments and quasi-experiments in field settings. In: *Reproduced in Part in Research in Organizations: Issues and Controversies*. Goodyear Publishing Company.
- Cosenz, F., Noto, G., 2018. A dynamic business modelling approach to design and experiment new business venture strategies. *Long. Range Plan.* 51 (1), 127–140.
- Cozzolino, A., Verona, G., Rothaermel, F.T., 2018. Unpacking the disruption process: new technology, business models, and incumbent adaptation. *J. Manag. Stud.* 55 (7), 1166–1202.
- Dentchev, N., Rauter, R., Jóhannsdóttir, L., Snihur, Y., Rosano, M., Baumgartner, R., et al., 2018. Embracing the variety of sustainable business models: a prolific field of research and a future research agenda. *J. Clean. Prod.* 194, 695–703.
- Desyllas, P., Sako, M., 2013. Profiting from business model innovation: evidence from Pay-As-You-Drive auto insurance. *Res. Policy* 42 (1), 101–116.
- Doganova, L., Eyquem-Renault, M., 2009. What do business models do?: innovation devices in technology entrepreneurship. *Res. Policy* 38 (10), 1559–1570.
- Fauchart, E., Gruber, M., 2011. Darwinians, communitarians, and missionaries: the role of founder identity in entrepreneurship. *Acad. Manag. J.* 54 (5), 935–957.
- Felin, T., Gambardella, A., Stern, S., & Zenger, T. (in press). Lean startup and the business model: experimentation revisited. *Forthcoming in Long Range Planning (Open Access)*.
- Ferraro, F., Etzion, D., Gehman, J., 2015. Tackling grand challenges pragmatically: Robust action revisited. *Organization Studies* 36 (3), 363–390.
- Garbuio, M., Dong, A., Lin, N., Tschang, T., Lovallo, D., 2018. Demystifying the genius of entrepreneurship: how design cognition can help create the next generation of entrepreneurs. *Acad. Manag. Learn. Educ.* 17 (1), 41–61.
- Garud, R., Karnøe, P., 2003. Bricolage versus breakthrough: distributed and embedded agency in technology entrepreneurship. *Res. Policy* 32 (2), 277–300.
- Garud, R., Schildt, H.A., Lant, T.K., 2014. Entrepreneurial storytelling, future expectations, and the paradox of legitimacy. *Organ. Sci.* 25 (5), 1479–1492.
- Gerads, T., Phung, L., van Herpen, M., 2019. What Holds Back Corporate Social Innovators. *Harvard Business Review* 20 June 2019.
- Gibson, J.J., 1977. *The theory of affordances*. Hilldale, USA 1 (2).
- Girod, S.J.G., Whittington, R., 2015. Change escalation processes and complex adaptive systems: from incremental reconfigurations to discontinuous restructuring. *Organ. Sci.* 26 (5), 1520–1535.
- Grimes, M.G., 2018. The pivot: how founders respond to feedback through idea and identity work. *Acad. Manag. J.* 61 (5), 1692–1717.
- Hart, S.L., Milstein, M.B., 2003. Creating sustainable value. *Acad. Manag. Perspect.* 17 (2), 56–67.
- Joyce, A., Paquin, R.L., 2016. The triple layered business model canvas: a tool to design more sustainable business models. *J. Clean. Prod.* 135, 1474–1486.
- Khanagha, S., Volberda, H., Oshri, I., 2014. Business model renewal and ambidexterity: structural alteration and strategy formation process during transition to a Cloud business model. *R. D. Manag.* 44 (3), 322–340.
- Kraaijenhagen, C., Van Oppen, C., Bocken, N., 2016. *Circular Business. Collaborate & Circulate*. Circular Collaboration, Amersfoort, The Netherlands.
- Laasch, O., 2019. An actor-network perspective on business models: how ‘Being Responsible’ led to incremental but pervasive change. *Long. Range Plan.* 52 (3), 406–426.
- Langley, A.N.N., Smallman, C., Tsoukas, H., Van de Ven, A.H., 2013. Process studies of change in organization and management: unveiling temporality, activity, and flow. *Acad. Manag. J.* 56 (1), 1–13.
- Leatherbee, M., Katila, R., 2019. *The lean startup method: team composition, hypothesis-testing, and early-stage business models*. working paper (August 15, 2019). Available at SSRN: <https://ssrn.com/abstract=2902869>. <https://doi.org/10.2139/ssrn.2902689>.
- Lüdeke-Freund, F., Massa, L., Bocken, N., Brent, A., Musango, J., 2016. *Business Models for Shared Value*. Network for Business Sustainability, South Africa.
- Manninen, K., Koskela, S., Antikainen, R., Bocken, N., Dahlbo, H., Aminoff, A., 2018. Do circular economy business models capture intended environmental value propositions? *J. Clean. Prod.* 171, 413–422.
- Martins, L.L., Rindova, V.P., Greenbaum, B.E., 2015. Unlocking the hidden value of concepts: a cognitive approach to business model innovation. *Strateg. Entrep. J.* 9 (1), 99–117.
- McDonald, R., Eisenhardt, K., 2019. Parallel play: startups, nascent markets, and the search for a viable business model. *Adm. Sci. Q* forthcoming.
- McDonald, R., Gao, C., 2019. Pivoting Isn't Enough? Managing Strategic Reorientation in New Ventures. *Organization Science*, forthcoming.
- McGrath, R.G., 2010. Business models: a discovery driven approach. *Long. Range Plan.* 43 (2–3), 247–261.
- Navis, C., Ozbek, O.V., 2016. The right people in the wrong places: the paradox of entrepreneurial entry and successful opportunity realization. *Acad. Manag. Rev.* 41 (1), 109–129.
- Nicholls-Nixon, C.L., Cooper, A.C., Woo, C.Y., 2000. Strategic experimentation: understanding change and performance in new ventures. *J. Bus. Ventur.* 15 (5–6), 493–521.
- Nussholz, J.L., 2018. A circular business model mapping tool for creating value from prolonged product lifetime and closed material loops. *J. Clean. Prod.* 197, 185–194.
- O'Connor, E., 2002. *Storyed business: typology, intertextuality, and traffic in entrepreneurial narrative*. *J. Bus. Commun.* 39 (1), 36–54.
- Osterwalder, A., 2004. *The Business Model Ontology a Proposition in a Design Science Approach*. Doctoral dissertation. Université de Lausanne, Faculté des hautes études commerciales.
- Osterwalder, A., Pigneur, Y., 2010. *Business Model Generation: a Handbook for Visionaries, Game Changers, and Challengers*. John Wiley & Sons.
- Osterwalder, A., Pigneur, Y., Bernarda, G., Smith, A., 2014. *Value Proposition Design: How to Create Products and Services Customers Want*. John Wiley & Sons, New Jersey.
- Pati, R.K., Nandakumar, M.K., Ghobadian, A., Ireland, R.D., O'Regan, N., 2018. Business model design–performance relationship under external and internal

- contingencies: evidence from SMEs in an emerging economy. *Long. Range Plan.* 51 (5), 750–769.
- Perkmann, M., Spicer, A., 2014. How emerging organizations take form: the role of imprinting and values in organizational bricolage. *Organ. Sci.* 25 (6), 1785–1806.
- Pettigrew, A.M., 1992. The character and significance of strategy process research. *Strateg. Manag. J.* 13 (S2), 5–16.
- Plowman, D.A., Baker, L.T., B, T.E., Kulkarni, M., Solansky, S.T., Travis, D.V., 2007. Radical change accidentally: the emergence and amplification. *Acad. Manag. J.* 50 (3), 515–543.
- Ries, E., 2011. *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. Penguin Books, London, UK.
- Ries, E., 2017. *The Startup Way: Making Entrepreneurship a Fundamental Discipline of Every Enterprise*. Random House Audio.
- Rindova, V.P., Kotha, S., 2001. Continuous “morphing”: competing through dynamic capabilities, form, and function. *Acad. Manag. J.* 44 (6), 1263–1280.
- Rittel, H.W., Webber, M.M., 1974. Wicked problems. *Man-made Futures* 26 (1), 272–280.
- Sarasvathy, S.D., 2001. Causation and effectuation: toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management. Acad. Manag. Rev.* 26 (2), 243.
- Sarasvathy, S.D., 2009. *Effectuation: Elements of Entrepreneurial Expertise*. Edward Elgar Publishing.
- Sosna, M., Treviño-Rodríguez, R.N., Velamuri, S.R., 2010. Business model innovation through trial-and-error learning: the Naturhouse case. *Long. Range Plan.* 43 (2–3), 383–407.
- Snihur, Y., Lamine, W., Wright, M., 2019. Educating Engineers to Develop New Business Models: Exploiting Entrepreneurial Opportunities in Technology-Based Firms. *Technological Forecasting and Social Change*, forthcoming.
- Snihur, Y., Reiche, B.S., Quintane, E., 2017. Sustaining actor engagement during the opportunity development process. *Strateg. Entrep. J.* 11 (1), 1–17.
- Snihur, Y., Thomas, L.D., Burgelman, R.A., 2018. An ecosystem-level process model of business model disruption: the disruptor's gambit. *J. Manag. Stud.* 55 (7), 1278–1316.
- Snihur, Y., Zott, C., 2019. The genesis and metamorphosis of novelty imprints: how business model innovation emerges in young ventures. *Acad. Manag. J.* (forthcoming).
- Stubbs, W., Cocklin, C., 2008. Conceptualizing a “sustainability business model. *Organization & environment* 21 (2), 103–127.
- Teece, D.J., 2018. Business models and dynamic capabilities. *Long. Range Plan.* 51 (1), 40–49.
- Thomke, S.H., 1998. Managing experimentation in the design of new products. *Manag. Sci.* 44 (6), 743–762.
- Upward, A., Jones, P., 2016. An ontology for strongly sustainable business models: defining an enterprise framework compatible with natural and social science. *Organ. Environ.* 29 (1), 97–123.
- Weissbrod, I., 2019. Experimentation for sustainable innovation. In: Bocken, N., Ritala, P., Albareda, L., Verburg, R. (Eds.), *Innovation for Sustainability. Business Transformations towards a Better World*. Palgrave Macmillan Palgrave Studies in Sustainable Business.
- Weissbrod, I., Bocken, N.M., 2017. Developing sustainable business experimentation capability—A case study. *J. Clean. Prod.* 142, 2663–2676.
- Whalen, K.A., Berlin, C., Ekberg, J., Barletta, I., Hammersberg, P., 2018. ‘All they do is win’: lessons learned from use of a serious game for Circular Economy education. *Resour. Conserv. Recycl.* 135, 335–345.
- Yunus, M., Moingeon, B., Lehmann-Ortega, L., 2010. Building social business models: lessons from the grameen experience. *Long. Range Plan.* 43 (2/3), 308–325.
- Zott, C., Amit, R., 2007. Business model design and the performance of entrepreneurial firms. *Organ. Sci.* 18 (2), 181–199.
- Zuzul, T., Tripsas, M., 2019. Start-up inertia versus flexibility: the role of founder identity in a nascent industry. *Adm. Sci. Q.* forthcoming.

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