Corporate-startup Collaboration: Its Diffusion to and within the Firm

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Abstract

In an age of digital transformation, startup collaboration as an avenue for corporate innovation has increased in importance. However, the diffusion of corporate-startup collaboration models, to and within firms, is not well researched. The purpose of this article is to view a corporate-startup collaboration model as an organizational innovation and thereby, by using an established framework for the diffusion of innovations on a real case, “FirstBuild”, improve our understanding of how this type of organizational innovation is diffused to and within firms. The theoretical contribution of the article is to be the first study to investigate the diffusion of a corporate-startup collaboration model and thereby fill an existing knowledge gap on how this type of innovation is diffused to and within a firm. This is of relevance for both corporations as well as policy makers in an ongoing digital transformation of countries and their large firms.

Keywords

Corporate-Startup Collaboration – Innovation – Diffusion – FirstBuild – GE – Triple Helix
Arabic

تعميمه بين الشركات وداخل الشركة الواحدة: التعاون بين الشركات الناشئة

Annika Steiber

أصبح التعاون في المراحل المبكرة والذي يعتبر كمسار لابتكار في المؤسسات أكثر أهمية في عصر التحول الرقمي. بالرغم من ذلك يبقى تعميم ونشر نماذج التعاون بين الشركات والشركات الناشئة وداخل المؤسسة يشكل من نقص في التوثيق. يهدف هذا المقال إلى اعتبار نموذج التعاون بين الشركات الناشئة بناءً على ابتكار تنظيمي. قمنا باستخدام إطار معتمد لنشر الإبداعات التنظيمية في حالات واقعية، أو "البناء الأول". تحسين فهمنا للكيفية التي يتم بها نشر وتفاهم هذه النوع من الإبداع التنظيمي بين الشركات وداخلها. تمثل المساهمة النظرية لهذا المقال في كونه أول بحث يهتم بدراسة نشر وتعزيز نماذج التعاون بين الشركات والشركات الناشئة وداخل المؤسسات. مكنت هذه الدراسة من بدء الفجوة في المعرفة حول كيفية نشر وتعزيز هذا النوع من الإبداع داخل أي شركة. تكتسي هذه الإضافة أهمية كبيرة لكل من الشركات وصانعي السياسات في ظل التحول الرقمي الجارى في البلدان والشركات الكبرى.

الكلمات المفتاح

التعاون بين الشركات والشركات الناشئة، الابتكار، نشر، البناء الأول، المؤسسات الكبرى، المراوح الثلاثة

Chinese

大企业-初创小企业合作：它朝公司的扩散和在公司内部的扩散

Annika Steiber

摘要

在朝数字化转型的时代，初创小企业的合作作为大企业创新的林荫道日益重要。然而，对大企业与初创小企业之间的合作模式（朝向公司和在公司内部的）的扩散还没有深入的研究。本文将大企业-初创小企业合作模型视为组织创新，从而把已建立起来的理论框架用于实际案例“FirstBuild”，促进我们理解这种组织创新如何扩散到公司和在公司内部传播。本文的理论贡献是第一个研究大企业-初创小企业合作向公司和在公司内部的扩散，填补了关于这种创新如何向单个公司和在其内部扩散的知识空白。这在国家及其大企业进行数字化转型中对于大企业和政策制定者都具有重要意义。
Diffusion de la collaboration entreprise-startup vers l'entreprise et en son sein

**Annika Steiber**

**Résumé**

A l’ère de la transformation numérique, la collaboration avec les startups comme un chemin vers l’innovation des entreprises a connu une importance accrue. Cependant, la diffusion des modèles de collaboration entreprise-startup vers les entreprises et en leur sein, n’est pas assez documentée. Cet article vise à considérer un modèle de collaboration entreprise-startup comme une innovation organisationnelle et, partant, en utilisant un cadre établi pour la diffusion des innovations organisationnelles sur un cas réel “FirstBuild”, améliorer la compréhension de la manière dont ce type d’innovations organisationnelles est diffusé vers les entreprises et en leur sein. C’est la première étude à investiguer la diffusion des modèles de collaboration entreprise-startup vers les entreprises et en leur sein, et comble le fossé de connaissances sur le moyen par lequel ce type d’innovation peut se diffuser vers une même entreprise et en son sein. Ceci est pertinent à la fois pour les entreprises et pour les décideurs politiques dans une transformation numérique des pays en cours et de leurs grandes entreprises.

**Mots-clés**

Collaboration entreprise-startup – innovation – diffusion – FirstBuild – GE – Triple Hélice
Portuguese

Colaboração em empresas: sua difusão para e dentro da empresa

Annika Steiber

Resumo

Em uma era de transformação digital, a Startup colaboração como uma avenida para a inovação corporativa aumentou em importância. No entanto, a difusão de modelos de colaboração entre empresas e empresas, dentro e fora das empresas, não é bem pesquisada. O objetivo deste artigo é visualizar um modelo de colaboração entre empresas e startups como uma inovação organizacional e, desse modo, usando uma estrutura estabelecida para a difusão de inovações organizacionais em um caso real, ‘FirstBuild’, aprimore nosso entendimento de como esse tipo de organização inovações é difundida para e dentro das empresas. A contribuição teórica deste artigo é o primeiro estudo a investigar a difusão de modelos de colaboração entre empresas e empresas para e dentro das empresas e, assim, preencher a lacuna de conhecimento sobre como esse tipo de inovação pode se difundir para e dentro de uma única empresa. Isso é relevante tanto para as empresas quanto para os formuladores de políticas em uma transformação digital contínua dos países e de suas grandes empresas.

Palavras-chave

Colaboração Corporativa Startup – Inovação – Difusão – FirstBuild – GE – Triple Helix
Коллaborация между корпорацией и стартапом: диффузия снаружи и внутри фирм

Анника Штейбер

Аннотация

В век цифровой трансформации повышается значимость коллаборации корпораций со стартапами для создания инноваций. Однако, диффузия коллаборационных моделей корпорация-стартап снаружи и внутри фирм является недостаточно изученной. Целью настоящей работы является изучение коллаборационной модели корпорация-стартап в качестве организационной инновации и возможностей ее использования в качестве стандартной модели для диффузии инноваций на примере кейса “FirstBuild” и углубления нашего понимания о том, как данный тип организационных инноваций диффундирует снаружи и внутри фирм. Теоретический вклад настоящего исследования заключается в том, что оно является первой работой, посвященной изучению диффузии коллаборационных моделей корпорация-стартап между фирмами, и тем самым способно заполнить пробел в знаниях о механизмах проникновения данного типа инноваций в фирму и движении внутри нее. Результаты исследования будут интересны как корпорациям, так и законодательным органам, занимающимися последовательной цифровой трансформацией стран и расположенных в них крупных фирм.

Ключевые слова

Коллаборация корпорация-стартап – Инновации – Диффузия – кейс “FirstBuild” – GE – Тройная спираль
Spanish

Colaboración corporativo-Startup: su difusión hacia y dentro de la empresa

Annika Steiber

Resumen

En una era de transformación digital, la colaboración de Startup como una vía para la innovación corporativa ha aumentado en importancia. Sin embargo, la difusión de los modelos de colaboración entre empresas y startups, hacia y dentro de las empresas, no está bien investigada. El propósito de este documento es ver un modelo de colaboración entre empresas y startups como una innovación organizacional y, por lo tanto, mediante el uso de un marco establecido para la difusión de innovaciones organizacionales en un caso real, ‘FirstBuild’, mejorar nuestra comprensión de cómo este tipo de organización y las innovaciones se difunden hacia y dentro de las empresas. La contribución teórica de este documento es ser el primer estudio que investigue la difusión de los modelos de colaboración entre empresas y startups hacia y dentro de las empresas y, por lo tanto, llene la brecha de conocimiento sobre cómo este tipo de innovación puede difundirse hacia y dentro de una sola empresa. Esto es relevante tanto para las corporaciones como para los responsables políticos en una transformación digital en curso de los países y sus grandes empresas.

Palabras clave

Corporativo-Startup Colaboración – Innovación – Difusión – FirstBuild – GE – Triple Helix

1 Introduction

Accelerating STEM advances are transforming every industry. This poses a serious challenge for many large, previously successful companies, which in times of discontinuous change may have difficulty innovating and therefore surviving as existing resources, processes and firm cultures meant to strengthen existing lines of business, tend to stifle exploration of the new (March 1991; Christensen and Overdorff 2000; Kim and Toh 2019). Dorothy Leonard-Barton
put it succinctly by saying that when the environment changes, the firm’s core capabilities become core rigidities (Leonard-Barton 1992). Startups, on the other hand, don’t have legacy structures or practices and are usually more agile in introducing not only technical innovations, but also new ways of operating, such as new processes for design, production, distribution and sales. Startups also have access to new entrepreneurial ecosystems (Drori and Wright 2018), which might not be known or accessible to the large firm. Factors such as these have, combined with the pressure of digital transformation, created an increased interest in the roles that startups could play in corporate innovation. Working with large firms is also of interest to many startups, as it could be a way for them to overcome innovation diffusion challenges (Autio et al. 2018). Corporate-startup collaboration could therefore be a win-win for both parties.

While the concept ‘open innovation’ is well researched (e.g. Chesbrough 2003; Serrono and Fischer 2007; Nambisan and Sawhney 2007; Nelli 2013; and Noh 2015), research on corporate-startup collaboration as a phenomenon is rather new and the various ways in which large, established firms can, and should, work with startups for innovation¹ is not yet well researched (Hogenhuis et al. 2017). One typology to categorize different models by which larger firms can collaborate with startups is presented in Alänge and Steiber (2019). As startups play an increasingly important role in corporate innovation, it is important, however, not to only understand how this form of collaboration could be structured and managed, but also how this new form of collaboration model for large-firm exploration is diffused to and within firms.

The purpose of this article is to view a corporate-startup collaboration model as an organizational innovation² and thereby, by using an established framework for the diffusion of innovations on a real case on corporate-startup collaboration, improve our understanding of how this organizational innovation is diffused to and within firms.

The theoretical contribution of this paper is to be the first study to investigate the diffusion of a corporate-startup collaboration model to and within a firm. The paper increases our understanding of how this type of innovation can diffuse, something that should be of relevance for both corporations as well as policy makers in the ongoing digital transformation of countries and their large firms.

The following section presents a theoretical context drawn from several years’ literature reviews as well as empirical research on the diffusion of innovations. This section ends with a presentation of a framework for the diffusion of organizational innovations to and within firms developed by Steiber and Alänge (2015). Next, by using a ‘diffusion of innovations’ lens, the case of gea-FirstBuild will be presented. Third, the case will be discussed from the
perspective of the presented framework. Finally, conclusions and implications, as well as suggestions for future research will be presented.

2 A framework for the Diffusion of Organizational Innovations

In the age of digital transformation of corporations, innovation diffusion theories could help to explain and improve both the adoption and implementation of new technical and organizational innovations. In this paper, a digital transformation of any large firm is viewed as a result of adoptions and implementations of technical and organizational innovations. In fact, organizational innovations are often necessary for technical innovations, such as in the implementation of new technologies (Freeman 1982; Leonard-Barton 1988; Tushman and O’Reilly 1997; Teece 1997; Volberda et al. 2013). According to Ganter and Hecker (2014), many attempts at adaptation to environmental change pertain to organizational innovations. In a global marketplace that changes continually due to rapid technological development, organizations need to not only adopt and implement technical innovations, but also to make even more effective use of organizational innovations in order to uphold their competitiveness. However, in spite of the fact that organizational innovations create long-term competitive advantages and are important for technical innovations, they “remain poorly managed and poorly understood” (Birkinshaw and Mol 2006). Previous research has therefore identified a need to develop a more comprehensive model to better understand the mechanisms behind the diffusion of organizational innovations (Frambach and Schillewaert 2002; Ganter and Hecker 2014).

For this reason Alänge et al. (1998) explored the extent to which the literature on innovation and diffusion, although focused on technical innovations, can contribute to a useful analytical framework for studying the diffusion of organizational innovations. Their findings were that organizational and technical innovations share a set of characteristics, as follows. In both, the nature of the innovation and diffusion process is cumulative and path dependent. To a certain degree, both types of innovations include tacit knowledge (embodied in persons), which is why formal and informal networks are important for knowledge transfer through interpersonal contacts. The investment decisions made through these networks create a specific nature of regional technology systems, which in turn affect the rate and direction of the firms’ search process for innovations. The increasing return on existing innovations and inertia characterize a firm’s innovation process for both innovations. Further, the innovation and diffusion process is not distinguished in a meaningful way as a
product or new organizational process is “innovated on” while diffusing to new companies.

However, Alänge et al. (1998) also found that the two types of innovations differ in some important respects. For example, the authors found that organizational innovations are tacit to an even higher degree than technical innovations. Further, they wrote that the market (supply side) of organizational innovations is “…relatively poorly functioning and that the local nature of the search process is even more accentuated” (1998: 3). The implications due to these differences, according to the authors, are that much more care has to be taken to “…define the organizational innovation and that the ‘inside’ (the firm’s absorptive capacity and what shapes the nature of it) of the firm is particular critical to understand when analyzing the diffusion of organizational innovations” (p. 4). In addition, due to the tacit and often less “standardized” nature of organizational innovations, the transfer and implementation costs may be higher for this type of innovation, which is why the “…issue of standardization is central to the diffusion process” (p. 4). Therefore the diffusion process could be expected to take longer time than for technical innovations, and non-market mechanisms for the transfer of organizational innovations are of considerable importance (Alänge et al. 1998).

Based on Alänge et al. (1998) and several empirical studies conducted by Alänge and Steiber (2009, 2011), as well as the study of innovation programs by Steiber and Alänge (2013), Steiber and Alänge (2015) published a comprehensive conceptual model for the diffusion of organizational innovations. Below, this model is introduced, illustrated and explained.

3 A Comprehensive Model for the Diffusion of Organizational Innovations

The model in Figure 1 includes five steps that any firm would go through when searching for, adopting, and implementing an organizational innovation. The steps are: desirability, feasibility, first trial, implementing, and sustaining. These five steps are in turn subject to three sets of influencing factors: the characteristics of the innovation itself (e.g., degree of tacitness, set 1); the internal context (e.g., degree of user competence, ability to unlearn, degree of inertia, set 2), and the external context and diffusion channels (e.g., the institutional setup and degree of interpersonal contacts, set 3).

The framework above suggests that the diffusion of organizational innovations takes place to and within a firm. With ‘within’ it is here meant on a functional, business unit, or firm-level. In fact most organization starts the
implementation (step 4) by implementing the organizational innovation in one function or business unit (Alänge and Steiber, 2011). If the outcome is perceived as positive, the next step in the diffusion process is usually that other functions, or business units also decide to implement the innovation, or that the executive team decides on a more full-scale firm-level implementation.

In Figure 1, the five steps are visualized as a circular pattern around an organizational improvement trajectory. The re-invention of the organizational improvement trajectory is cumulative and path-dependent, due to increasing returns on existing investments, as well as on internal inertia among top managers and employees. Thus, the desirability and perceived feasibility of any new innovation, as well as the decision whether to try it and implement it, is affected by previously chosen innovations, and also by the local institutional set-up and technological systems.

Interestingly, on a national and even international level, there are organizational improvement trajectories as well, in which innovations diffuse between firms or organizations and are gradually re-invented, and at a certain point in
time, are challenged by new innovations. These national/international improvement trajectories have a considerable influence on an organization's improvement trajectory (Älänge and Steiber 2011).

The inner circle in Figure 1 represents the internal context in an organization. Here, the top management's and even the board's absorptive capabilities are crucial for sensing and seizing opportunities and transforming (Teece et al. 1997) the business. Top management's past culture (Kim and Toh 2019), as well as their own inertia, user competence, and commitment to the innovation and the organization's current or new improvement trajectory are important, too, and can either limit or increase the internal inertia/path dependency and resistance to change. Further, the search and learning processes are cumulative and path-dependent, but the firm's people could break through potential path-dependency and inertia by becoming more conscious and systematic in their search for new solutions.

The two outer circles represent the external context and diffusion channels that transfer knowledge and experience into the organization. The outermost circle area depicts the external environment in the form of institutional setup, local norms, history, and existing weak-ties that the organization has through its employees with networks that are active outside the local context. The external environment also represents factors such as the sector's characteristic competitive pressure and dynamic, due to e.g. the pace of technological development. Increased competitive pressure and dynamic were found to increase desirability for organizational change. The dotted area represents diffusion channels such as movement of people (including CEOs), boards, user networks (e.g. competitors, customers, suppliers, other role models), bridging institutions (e.g. an industry organization), professors, and consultants. These diffusion channels could all play a role in “showing” and “proving” what is desirable and feasible, e.g. in regard to “new ways of working.”

The triggers (visualized as flashes in Figure 1) for each step in the five-step process could typically be any of several things. They could be a perceived crisis, a new market or owner demand (which in turn could have been triggered by technological development and lower entry barriers in a certain sector), imitation of organizational concepts developed by other companies in the user network, management's previous experience and beliefs in the innovation, standardization work done by bridging institutions, consultants and university professors, and/or management fads. An example of a trigger that influences several steps is “management beliefs,” which in turn are based on management's perception of, or experience of the innovation. An example of a trigger that was found to be more related to a single step was “consultant
experience,” which was commonly found in the first trial step and less so in earlier or later steps.

During the last two steps, “implementing” and “sustaining” an organizational innovation, management beliefs about the innovation do play an important role. Visible benefits from the new innovation are also important in order to sustain or strengthen management beliefs and increase overall internal support for change.

4 Methodology

The author’s empirical research on corporate-startup collaboration models began with identifying and contacting large companies that use various models to accelerate innovation via interaction with startups. The primary data was collected through semi-structured interviews with managers of innovation-accelerating “units” within the companies. Data collection took place from 2014 to 2017 and included 30 European and US multinational companies. Through interviews with these companies, the authors identified several different models for Corporate-Startup collaboration, all represented by one or more case companies (Steiber and Alänge, 2020). The cases were selected based on three criteria (Eisenhart and Graebner 2007):

1) Each case demonstrated a novel way of conducting innovation activities in collaboration with startups.
2) Each had shown visible results.
3) And, each selected case represented a different organizational solution, which allowed for analyzing similarities and differences between the cases.

Further research on the selected cases consisted primarily of follow up interviews with key corporate people and when possible, with company visits, along with gathering information from secondary sources on the web and in print.

In this article, one of these cases, the case of GEA-FirstBuild, is used as an illustration of an organizational innovation diffused, to and within GEA. A different version of the FirstBuild case was first published in Alänge and Steiber (2018), and later in Alänge and Steiber (2019). The version of the FirstBuild case used in this paper, has been substantially broadened and is analysed by using an innovation diffusion-perspective. In order to be able to present this case using a ‘Diffusion of Innovation’ perspective, more data was collected on this specific case during August and September 2019. The new data came from both secondary sources, as well as from empirical data from the new owner Haier at
the conference ‘The International Rendanheyi Model Forum, 2019’. Below the new version of the case; FirstBuild is presented.

5 The case of GEA-FirstBuild

GE Appliances (GEA), now a Haier company, is a well-established market leader in the home appliances industry. In 2014 GEA launched FirstBuild as a separate company.

The FirstBuild approach is to work as an independent brand in an extremely open interaction with external actors, such as small firms, without interference with or from the GE Appliances (GEA) brand. In 2017, FirstBuild had 23 employees working as brand ambassadors, makers, engineers and designers. Their mission, according to the FirstBuild homepage, was expressed as follows:

Invent a new world of home appliances by creating a socially-engaged community of home enthusiasts, designers, engineers, and makers who will share ideas, try them out, and build real products to improve your life.

The business model was to create a viable product, manufacture it in a low volume, and test it on real customers willing to pay for the new product. Further, the customers were pioneers and could be found among Rogers’s (1983) Innovators (first 5%) and Early Adopters (the next 9%). The assumption was that based on feedback and market data from these 14% of pioneering customers, it would then be possible for a new product to “cross the chasm” (Moore 1999) into a regular GEA business unit that would be responsible for scaling up ‘the product’, in order to reach the “early majority” in Roger’s terminology.

6 Frustration as a Trigger for Searching New Ways

The birth of FirstBuild was triggered by a frustration within GEA research and development with the previous way of doing product development (Hagel et al. 2019). The reason was that excellent product concepts, which fulfilled identified customer needs, still didn’t reach the market if they were slightly outside the existing core line of products and services. In addition, new entrants, competitors from Asia, became successful by entering the US market with offerings based on solutions similar to those that remained in the research laboratories at GEA.
Learning from Startups

The frustration within GEA led to an interest in learning from startups that excel in the early phases of product and business model development, and succeed in bringing new products rapidly to market for testing with early customers. Studies of startup companies were combined with learning from workshops at GE, where the authors behind the concept of Customer Development (Steve Blank) and Lean Startup (Eric Ries) had been invited to present their ideas on how to more efficiently build startups and corporate ventures. As a result, various units inside GE started to practice the Lean Startup methodology and reported some success (Blank 2013). This “learning-by-doing” provided an understanding of what was required for rapid learning processes with customers – but it also led to the realization that the road to a more nimble way of developing new products and business models can be very challenging, if not impossible, inside a large corporation.

Learning from the Maker Movement and Role Models

The conclusion was that Lean Startup was interesting for GEA but something additional was needed, a different operating model. Inspiration came from meetings with representatives from the Maker movement, who had demonstrated approaches to product and business model development that were very different from traditional ways, but were still perceived as viable. The vehicle company Local Motors, the 3D printer company MakerBot (which had experience in developing the online forum Thingiverse), and TechShop (a makerspace chain then operating in several US cities) all became important partners to cooperate with and learn from.

Local Motors was viewed as an interesting partner as the firm was developing open source cars, a relatively complicated product. Local Motors uses an online platform to crowd-source vehicle design and engineering ideas, which it prototypes in small open-access factories (https://localmotors.com/). By using in-house expertise to channel the wisdom of the crowd, the company has launched new open-source vehicles in much less time and at a fraction of the cost typical for conventional automakers. What caught GE’s attention was a Local Motors project for DARPA to design and prototype a military vehicle. The job was done in an extremely short time, just four months, and received positive press (e.g. SEMA 2011) along with acknowledgement in a speech by President Obama (Obama 2011). GE leaders wanted to learn co-creation from Local Motors, and a contract was signed between the two parties aiming at emulating the Local Motors process.
9 The Wake-up Call

The launch of FirstBuild was inspired by the learning process mentioned above, but also by a hackathon organized early in 2014 in cooperation with a Louisville hacker group, lvl1. The winner at this hackathon “was an oven with a bar-code scanner capable of reading and perfectly executing cooking instructions encoded on packaged food. ... To the executives at GEA, Cprek’s (the team leader) hack was a wake-up call. ... That the executives were now staring at a working prototype of an idea they already liked – from an outside source – made them wonder how much innovation they were letting slide by” (Alänge and Steiber 2019: 23).

10 The Launch of FirstBuild

Backed by new insights, from practicing Lean Startup methodology within GE to learning from Local Motors and the hackathon in 2014, Kevin Nolan (then VP of technology and now the president and CEO of GEA) and Natarajan Venkatakrishnan launched FirstBuild in 2014. The new company was “founded without a financial lifeline to the parent company – only a fixed pool of funds. Beyond that, FirstBuild survives on revenues from the products it successfully crowdsfunds” (Hagel et al. 2019: 6). At the grand opening of the microfactory, Nolan – thanked the project’s partners such as the University of Louisville, city and state government, and the national makerspace, Local Motors; together they would rewrite manufacturing history (Chapman 2014). All partners were positive about the launch and identified benefits not only for GEA, but for local inventors (the city), for the University of Louisville students who now could test their ideas in real life, and for the region, which could benefit from the collaboration between the university and FirstBuild. In only 3 months, GEA had turned the space at 333 East Brandies Avenue from a dark and dirty warehouse, into a “sleek, modern and bright space” (Chapman 2014).

11 A Description of FirstBuild

FirstBuild is run like a startup company, with very few prescribed processes, checkpoints or meetings. Instead it utilizes a combination of very experienced engineers inside and direct input from the outside. Two essential features of FirstBuild; its online forum, which harnesses the brain power of a global community – grown from 8,000 members in 2014 to 23,000 members in September 2017 (Hagel et al. 2019) – and its microfactory was described in these terms:
A microfactory is a place where your ideas can grow into real products. Through the use of advanced manufacturing techniques and rapid prototyping tools, products can be made on a very small scale up to the thousands. This enables products to quickly move from concept to creation to showroom floor. The FirstBuild microfactory is divided into four sections: an interactive space for brainstorming and product demonstration, a lab for prototyping, a shop to fabricate components, and a build floor where products are assembled. (Alänge and Steiber 2019a)

Anyone can submit ideas on the online forum and even build early prototypes with 3-D printers and the tools available in the FirstBuild workshop. Once posted, others can vote for, or improve on the idea/design. If a design idea is considered promising by the FirstBuild community and the GEA leadership, it can become an official project, with GEA engineers and designers helping to develop a more advanced prototype, which, if feasible, can go into low-volume production at FirstBuild.

The microfactory is located on the University of Louisville’s campus. Anyone can come to FirstBuild to work on his or her own projects, or collaborate with the FirstBuild team on current community projects. A benefit of FirstBuild being on the university campus is that it serves as a resource for students and faculty who can work with state-of-the-art manufacturing equipment. By actually applying knowledge provided through lectures, both faculty and students can learn more and become better. Further, it also enables the university’s students and faculty to interact with engineers and the community to innovate and accelerate the production of kitchen appliances. In this way the university can position itself as a ‘hotbed’ for innovation and thereby foster partnerships with local industry (Chapman 2014). For the local Government, a microfactory at the University of Louisville is also beneficial. The region can not only attract more students and faculties to the local university, but also help the local community to thrive and grow through new innovations and learning. By having the triple helix concept’s all three helices: the industry, the university, and the government involved in the FirstBuild initiative, the economic development of the region could be positively affected.

As the FirstBuild production volume is low, typically below 1,000–1,500 units, the financial risk is limited, which means that the product development time can be considerably shorter than if a large firm wants to introduce a new product. As an example, the time from idea to market has gone from 8 months in 2014 down to 4 months in 2016 (Hagel et al. 2019). The products are sold online, and prizes and sales royalties are awarded to community members who make significant contributions (GE Appliances homepage, accessed July 24, 2019).
The most popular products have the potential of scaling up to mass production at GEA. When an idea is put into production at FirstBuild and reaches the market, the idea provider gets 1% of net sales as royalties for 3 years plus a non-exclusive license. Ownership rights are of no importance for FirstBuild because of the speed within the industry, which outstrips the speed of the US patent system. This means that the idea provider can take the idea to any other place or application, as FirstBuild never insists on IP rights or any kind of restrictions.

So why would a regular business unit in GEA accept a new product that has been developed outside its control? The thought is that when a new product has been proved by customers' approval and willingness to pay a price for it, the end result is the establishment of a small market for the product. FirstBuild can then go to GEA with much more data on the innovative product and its market than what an internal R&D unit can offer, which typically is only an engineering prototype, without any customer feedback or actual market data. In fact, the input from FirstBuild can even cover more than just the product and the test of the market, as it can also include experience and data from testing a new business model. For example, the FirstBuild product might have been sold and marketed in a new way, or reached a new target market, with a different cost structure than usual. All such “features” of the new concept will have been tested, and FirstBuild can provide data on all of them for the GEA business unit.

From Value Creation to Value Capturing

Having the GEA nearby is viewed as an advantage and as something that can assist in crossing the chasm and avoiding the “valley of death.” FirstBuild could be viewed as a “fat startup in a rich kid’s world,” in the sense that it can afford to test approaches that might threaten the survival of a traditional startup. Although FirstBuild is an independent legal unit, maintaining autonomy can be difficult, as the parent company keeps intervening and FirstBuild keeps fighting back as a rebel; “We spend 20% of our energy keeping the mother ship away.” (Alänge and Steiber 2019: 26).

The main challenge is scaling up within the parent company’s business units. FirstBuild allows GEA to test new product ideas on customers without jeopardizing its brand reputation, as the products are sold under a different brand. However, the subsequent integration of a promising, market-proven product into a GEA business unit is still a challenge related to brand. The reason is that the brand is intimately linked to the existing supply chain and
distribution channels, which means that the core brand name is a constraint because it ties the company to an existing business model with suppliers and distributors. Large companies typically look for some form of validation in existing channels to market, which in the case of GEA Appliances could be the purchaser at a major retailer, such as Home Depot.

FirstBuild needs to first develop the products that are brought into GEA business units, and it needs to find ways of integrating these products into the business units. One example on a case when this has happened is the GE Monogram pizza oven that went to market with the GE brand on it a couple of years ago (Hulfish 2017).

13 FirstBuild Goes International

In early 2019, FirstBuild opened a location in India with support from the state of Telangana and in collaboration with the country’s largest makerspace, T-Works, a new prototyping center (Wood 2018). The reason behind the investment is to harness community insights and the power of the maker movement to change “how products come to market around the world” (Wood 2018). The investment in India is the third, after the launch of the Louisville center and one in Shanghai. At this time GEA proudly declares that FirstBuild is to be: “another way GE Appliances is driving a robust product pipeline” (Wood 2018).

14 Discussion

This section will use the framework for the diffusion of organizational innovations when discussing the FirstBuild case. The case will be examined from the framework of the three sets of factors and five steps influencing the diffusion of this kind of organizational innovation to GEA.

15 The External Environment and Diffusion Channels

As was stated earlier, the innovation and diffusion process is cumulative and path dependent, depending on the specific nature of the regional system. Further, the regional system affects the firm’s search process for innovation.

In this case, GEA was influenced in several ways by the regional/national system. First, the culture at the time in the USA affected entrepreneurial activities in regards to the entry and adoption of new organizational innovations (Autio et al. 2013). The American management consultants Steve Blanc and
Eric Ries became important diffusion mechanism of new organizational innovations that were observed and tested at GE on Lean Startup methodology. Second, they were influenced by new players, such as Local Motors, Techshop and MakerBot. These players are part of, what is here called ‘user networks’ and they act as diffusion mechanisms in the diffusion of the maker movement idea, together with an online forum/open source platform to g.e.a. As the search process has been found to be local in its nature, the fact that Lean startup methodology and Local Motors were both American phenomenon do play a role for the diffusion of these thoughts to g.e.a.

In addition, the local institutional setup in the form of the University of Louisville and the city also played an important role in the adoption of the FirstBuild model. For example, the university was keen to develop its engineering partnership with GE (Hagel et al. 2019), which is why they offered to renovate a warehouse for the new venture. The city government was also very supportive, as the co-creation center could strengthen the city. With g.e.a and both of these other parties backing the venture, FirstBuild was a live operation only three months after its announcement. This could be viewed as an excellent example of a successful triple helix approach to innovation (Etzkowitz 2003).

Finally, the competitive pressure and dynamic also positively contributed to the diffusion of this new way of working. As has been mentioned earlier, not only is the national system and its improvement trajectory important for local organizations’ improvement trajectory, but so are also international improvement trajectories (e.g. an increasing trend to work with open innovation (Chesbrough, 2003)).

The Nature of the Innovation

In the creation of FirstBuild, a substantial amount of tacit knowledge was transferred via interpersonal networks, from management gurus and role-model firms such as Local Motors. The FirstBuild model could be viewed as based on the philosophies of both these sources. The Lean Startup methodology emphasizes keeping investment cost down while testing and validating a new product – the idea is to learn fast, fail fast, and test on real users. New concepts from role models such as Local Motors included the use of an online forum, an open source platform and the microfactory. All of these new ways of working are tacit and need to be explained and “packaged,” by what are here labeled “diffusion mechanisms”, such as the management gurus and Local Motors. The two diffusion mechanisms of new knowledge also made up for the lack of a traditional supply-side market of organizational innovations. Due to
the lack of a traditional market for this kind of innovations, more focus needed to be on defining the organizational innovation as well as on the receiving firm’s absorptive capacity and what shapes the nature of it. In this specific case, through the interpersonal contacts, the different components of the FirstBuild model – an online and physical co-creation community, combined with a rapid process for developing a minimum viable product (MVP) – were in a way defined and even possible to observe and try (as in the hackathon in 2014).

This in turn should have affected GEA’s absorptive capacity in a positive way, making it more clear to executives “what the innovation in reality is,” as well as making it possible to judge the feasibility and potential risks and costs of the innovation for GEA.

17 The Internal Context

The internal context of GEA played an important role for the adoption and implementation of FirstBuild. As was mentioned above, the firm’s absorptive capacity increased by the facts of: a sense of urgency due to competitive pressure, components of FirstBuild were defined and could be observed and even tried, and the institutional setup enabled a smooth launch of the new venture.

Let us now go through the five phases in Figure 1 for the diffusion of the new organizational innovation to and within GEA. First, there was a sense of urgency that triggered a desire to find new ways of working. The urgency was created by an increasingly dynamic environment and new more nimble competitors that proved to be much faster than GEA with new innovative products. This in turn created a frustration within GEA research and development, which ignited a search process for alternative ways of working. The executives’ willingness to listen to, and their user competence in the Lean startup methodology, were ignited by the actual hands-on experience from both the work with the management gurus and from the hackathon in 2014, in which they learned how fast a prototype can be developed.

The perception at the time was that Local Motors was very successful in their new way of working with product development, and they had been acknowledged for this by DARPA and the US president. Further, Local Motors developed hardware solutions, as did GEA. Local Motors therefore became an organization with a “lower organizational distance” from GEA (Steiber and Alänge 2015). All of these things affected GEA to move from “desire” to “feasible.”
18 Trial of the New Concept

The decision to actually test the concept was affected by the reduction of two perceived risks for GEA, the financial risk and the risk around the GEA brand (and therefore relationships with e.g. important distributors of GEA’s products). As we have seen earlier, the transfer and implementation costs are usually higher for organizational innovations compared to technical innovations. This is partly due to a lower degree of definition and “standardization” of the organizational innovation. In this case, components of FirstBuild were fairly well defined, which lowered the transfer and implementation costs. In addition, FirstBuild was founded “without a financial lifeline” (Hagel et al., 2019: 6) to GEA. Instead a fixed pool of funds was given to FirstBuild, after which the new venture had to generate its own income. In this way, the financial risk was low for GEA. Furthermore, FirstBuild was not resource-rich, which forced the team to do more with less (Hagel et al. 2019), as any startup would need to do. Also, FirstBuild was a separate venture with its own brand, which reduced the risk to GEA’s brand. In fact, the location of FirstBuild on a university campus might also have lowered the risk for GEA and its brand.

19 Implementation and Sustainability of the New Concept

As was clear from the case study, the implementation of the final part, the scale-up phase of the new FirstBuild model, was not obvious in the beginning. According to Alänge and Steiber (2019: 26), the FirstBuild team spent “20% of their time just to keep the mother ship away”. In addition, the actual integration – that is, the capturing of value from new products created and tested in FirstBuild – was still a challenge at the time of research. This could be an effect of internal inertia and path-dependency at GEA. It is a challenge to change the existing way of working in research and development, as the historical learning process is cumulative and path-dependent. In this case the internal R&D teams not only had to change their model so that innovative products could come in from the side, and from the outside; they also had to culturally accept externally generated innovations, which hadn’t been done historically. However, in the case of FirstBuild, GEA’s management beliefs in the new way to drive a larger product pipeline seemed to have secured the implementation of the new concept, and in 2019 the company itself on its homepage stated that “FirstBuild is ... another way GE Appliances is driving a robust product pipeline” (Wood 2018).
Finally, the sustainability of the FirstBuild concept could be proven by the fact that GEA now has opened up the same model in two new locations, Shanghai and India. In Shanghai, GEA Appliances collaborated with Shanghai Tech University and JiaoTong University as well as with the University of Michigan. FirstBuild in India is located at T-Works, the country’s largest makerspace. In addition, the state of Telangana is supporting the initiative as a driver toward the fourth industrialization of India. The government invested in a new infrastructure at T-Works, which will be one step in the right direction to: “Creating the culture of hands-on making and creating is necessary to fulfill the ‘Make in India’ vision and to take India into the fourth Industrial Revolution as a leader, not merely as a follower,” (Sharma 2018).

20 Conclusions and Implications

The conclusion is that the framework for the diffusion of organizational innovations “was applicable” for the corporate-startup collaboration model “FirstBuild”, in order to better understand the diffusion of this organizational innovation to and within the firm GEA.

The three sets of factors (external factors, internal factors, and the characteristics of the organizational innovation itself) were proved to influence the diffusion of the organizational innovation “FirstBuild”. The fact that the three helices (local industry, university, and government) all saw benefits with FirstBuild, played an important role for its launch and success, and thereby also for later launches in other countries. Even if GEA was inspired by the Lean Startup methodology for new corporate ventures, and by Local Motors and its open platform, a number of components of FirstBuild were tacit or not known. It was not until FirstBuild was launched and operated for a while, the organizational innovation could become more packaged and therefore more tangible, observable and possible to test and evaluate. However, by involving all three helices and make it possible for them all to see benefits with FirstBuild, the development work of, and the first implementation of the new innovation, could become a reality.

The lesson learned from this case is that there are a number of things that the local government could do in order to speed up a diffusion of corporate-startup collaboration models to local large firms. Since the search process is usually local, and the transfer and implementation costs are high if the organizational innovation isn’t “defined and packaged”, government could speed up the diffusion of corporate-startup collaboration models by supporting both corporations’ search for them, and the packaging and observation of them. As we saw in the FirstBuild case, the organizational distance usually needs to be
low in order for firms to even look at new concepts. For this reason the “packaging” of the new model should be translated to the specific industry in which the country’s large firms are active. As was the case in both FirstBuild Louisville and FirstBuild India, local or regional governments could also support the new venture by funding the new infrastructure and by covering parts of the large firm’s operational costs with the new venture. Here the local university could become an important provider of a physical space and being the “node” between players within the industry and resources at the university. Further, a national government could “push” a dissemination of corporate-startup collaboration models by instituting an annual award for the firm with the most successful model, which could be important for the region’s and nation’s economy. The government could also fund research in the area of corporate-startup collaboration and seek to disseminate new ways of working through researchers and other diffusion mechanisms to large firms in a country.

However, local firms can also become more proactive in their conscious search for new ways of working (i.e., organizational innovations). Companies usually don’t have R&D for organizational innovation, which is why the search process in most cases is unconscious and unstructured (Alänge et al. 1998). By being aware of the importance of user competence, in the board as well as among executives, top managers of a firm should not only more consciously search for new ways of working, but also observe and if possible try them, e.g. by taking a course in Lean Startup methodology. This user competence at the top, together with a sense of urgency, will positively affect the diffusion of corporate-startup collaboration models to the firm and also increase the likelihood of implementation and sustainability of such innovations. In order to further reduce the risks of inertia and path dependency, managers could think over solutions that would decrease the risks, both financially for a new venture and for the current business with its existing business model. A separate company with a separate brand could be one solution for reducing the company’s risks in the short- to medium term. If a large firm decides to trial a new way of working to speed up the product pipeline, or for any other reason, top management’s commitment and belief in the new concept is essential. If local government and universities also commit to the new venture, the chances for real implementation and sustainability should increase.

Future Research

This paper investigated how a totally new model for corporate-startup collaboration diffused to and within a corporation, a research area in which we currently have a knowledge gap. The innovation diffusion perspective and
the framework presented here can support our understanding of how to speed up the diffusion of this kind of organizational innovation, and thereby collaborations between large firms and startups. It could also be of benefit to add a triple helix perspective when using the framework. More research is needed on more cases, which could shed light on important implications for large firm managers, startup founders, but also for local universities and government.

**Endnotes**

1. In this article the author makes a distinction between a small firm, e.g. supplier and a startup for innovation, which usually owns the rights to new technology. The focus for the large firm is therefore mainly on "exploration", rather than exploitation of existing products and processes (Rothaermel and Alexandre, 2009)

2. Organizational innovations are here defined as new organizational methods in business practices, workplace organization, or external relations (OECD 2005).

3. No distinction is made here between organizational, managerial and administrative innovations. The purpose with those new organizational methods is typically an increasing operational efficiency and employee satisfaction or/and at improving an organization’s growth.

4. Boards as a diffusion mechanism for knowledge and experience of new innovations could play an important role as both an initial trigger to organizational change and for sustaining an implemented change in the organization. For this reason, the user competence among board members regarding the new innovation and their belief in its business value for the organization is important (Ålänge and Steiber 2009)

5. GEA was acquired by the Haier Group in 2016

6. The 1% is computed on the total value of an entirely new product, or on the value of a modification to an existing product.

7. Interestingly McKelvie et al. (2018) argue that the effectiveness of externally acquired knowledge is less important in environments that are perceived as highly dynamic in new venture innovation.

**References**

Alänge, S., Jacobsson, S., and Jarnehammar, A. (1998). Some Aspects of An Analytical Framework for Studying the Diffusion of Organisational Innovations. *Technology Analysis & Strategic Management, 10* (1), pp. 3–21.
Alänge, S., and Steiber, A. (2009). The Board’s Role in Sustaining Major Organizational Change: An Empirical Analysis of Three Change Programs. *International Journal of Quality Service Sciences*, 1 (3), pp. 280–293.

Alänge, S., and Steiber, A. (2011). Diffusion of Organisational Innovations: An Empirical Test of an Analytical Framework. *Technology Analysis & Strategic Management*, 23 (8), pp. 881–897.

Alänge, S., and Steiber, A. (2018). Three Models on how to Create an Ambidextrous Organization, *Triple Helix*, 5 (5), pp. 1–25.

Alänge, S., and Steiber, A. (2019). FirstBuild: Combining the Innovativeness of a Small Startup with a Large Corporation’s Strengths. In: Nourani, C.F., ed., *Computing Predictive Analytics, Business Intelligence, and Economics: Modelling Techniques with Startups and Incubators*. Waretown, NJ: Apple Academic Press, pp. 13–36.

Autio, E., Nambisan, S., Thomas, L., Wright, M. (2018), “Digital affordances, spatial affordances and the genesis of entrepreneurial ecosystems”, *Strategic Entrepreneurship Journal*, 12 (1), pp. 72–95.

Autio, E, Pathak, S. & Wennberg, K. (2013), Consequences of Cultural Practices for Entrepreneurial Behaviors, *Journal of International Business Studies*, Vol: 44, pp: 334–362.

Birkinshaw, J., Zimmerman, A., & Raisch, S. (2016). “How do firms adapt to discontinuous change? Bridging the dynamic capabilities and ambidexterity perspectives”, *California Management Review*, 58(4), pp: 36–58.

Blank, S.G. (2013). *Why the Lean Startup Changes Everything*. *Harvard Business Review*, 91 (5), pp. 63–72.

Chapman, M. (2014). InSide Louisville web page. Available at: https://insiderlouisville.com/economy/startups/firstbuild-microfactory-grand-opening-re-writing-manufacturing-history/ (accessed July 2019).

Chesbrough, H. (2003). *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Boston, MA: Harvard Business School Press.

Christensen, C.M., and Overdorf, M. (2000). Meeting the Challenge of Disruptive Change. *Harvard Business Review*, 78 (2), pp. 66–76.

Drori, I., and Wright, M. (2018). Accelerators: Characteristics, Trends and the New Entrepreneurial Ecosystem. In: Wright and Drori, eds., *Accelerators. Successful Venture and Growth*. Cheltenham, UK and Northampton, USA: E.E. Elgar pp. 1–20.

Eisenhardt, K.M., and Graebner M.E. (2007). Theory Building from Cases: Opportunities and Challenges. *Academy of Management Journal*, 50 (1), pp. 25–32.

Etzkowitz H. (2003). Innovation in Innovation: The Triple Helix of University–Industry–Government Relations. *Social Science Information*, 42 (3), pp. 293–337.

Frambach R.T., and Schillewaert, N. (2002). Organizational Innovation Adoption – A Multi-Level Framework of Determinants and Opportunities for Future Research. *Journal of Business Research*, 55, pp. 163–176.

Freeman, C. (1982). *The Economics of Industrial Innovation*. London: Frances Pinter.
Ganter, A., and Hecker, A. (2014). Configurational Paths to Organizational Innovation: Qualitative Comparative Analyses of Antecedents and Contingencies. *Journal of Business Research*, 67, pp. 1285–1292.

Hagel, J., Seely Brown, J., De Maar, A., and Wooll, M. (2018). *GE First Build: A Trailblazing Workgroup Builds Community with the Crowd to Speed Innovation*. Deloitte Insights, Deloitte Center for the Edge. Available at: https://www2.deloitte.com/insights/us/en/topics/talent/business-performance-improvement/GE-FirstBuild.html (accessed 23 July, 2019).

Hogenhuis, B., Van den Hende, E., and Hultink, EJ (2017). Unlocking the Innovation Potential in Large Firms through Timely and Meaningful Interactions with Young Ventures. *International Journal of Innovation Management*, 21 (1).

Hulfish, G. (2017). Stomach Growling? This GE Monogram Pizza Oven Cooks Pizza in 2 Minutes Flat. Available at: https://www.digitaltrends.com/home/ge-monogram-pizza-oven/ (accessed August 2019).

Kim, J, Toh, S.M (2019). Stuck in the Past? The Influence of a Leader’s Past Cultural Experience on Group Culture and Positive and Negative Group Deviance. *Academy of Management Journal*, 62 (3), pp. 1–57.

Leonard-Barton, D. (1992). Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development. *Strategic Management Journal*, 13, pp. 111–125.

Local Motors (2019). Available at: https://localmotors.com/ (accessed July 2019).

McKelvie, A., Wiklund, J., and Brattström, A. (2018). Externally Acquired or Internally Generated? Knowledge Development and Perceived Environmental Dynamism in New Venture Innovation. *Entrepreneurship Theory and Practice*, 42 (1), pp. 24–46.

March, J.G. (1991). Exploration and Exploitation in Organizational Learning. *Organization Science*, 2, pp. 71–87.

Moore, G.A. (1999). *Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers*. New York, NY: Harper Business.

Nambisan, S., and Sawhney, M. (2007). A Buyer’s Guide to the Innovation Bazaar. *Harvard Business Review*, 85 (6), pp. 109–118.

Nelli, T. (2013). Extending Open Innovation Throughout the Value Chain by Small and Medium-Sized Manufacturers. *International Small Business Journal*, 31 (3), pp. 256–274.

Noh, Y. (2015). Financial Effects of Open Innovation in the Manufacturing Industry. *Management Decision*, 53 (7), pp. 1527–1544.

Obama, B. (2011). President Obama Talks about Local Motors in a Speech at Carnegie-Mellon, 23 June. Available at: https://www.youtube.com/watch?v=j_22D-hsoaU (accessed 29 February 2016).

Rogers, E.M. (1983). *Diffusion of Innovations*. New York, NY: Free Press.

Rothaermel, F.T., and Alexandre, M.T. (2009). Ambidexterity in Technology Sourcing: The Moderating Role of Absorptive Capacity. *Organization Science*, 20 (4), pp. 759–780.
SEMA (2011). President Obama Recognizes Local Motors, DARPA and American Manufacturing. Available at: https://www.sema.org/sema-enews/2011/26/president-obama-recognizes-local-motors-darpa-and-american-manufacturing-in-speech (accessed 29 February 2016).

Serrono, V., and Fischer, T. (2007). Collaborative Innovation in Ubiquitous Systems. International Manufacturing, 18, pp. 599–615.

Sharma, E.K. (2018). GE Appliances Expands Co-creating Community FirstBuild to India. Available at: https://www.businesstoday.in/current/corporate/ge-appliances-expands-co-creating-community-firstbuild-to-india/story/282315.html (accessed March 2020).

Steiber, A., and Alänge, S. (2015). Organizational Innovation: A Comprehensive Model for Catalyzing Organizational Development and Change in a Rapidly Changing World. Triple Helix, 2 (14).

Steiber, A., and Alänge S. (2020). Corporate-Startup Collaboration: Effects on Large Firms’ Business Transformation. (forthcoming).

Steiber, A., and Sverker, A. (2013). A Corporate System for Continuous Innovation: The Case of Google Inc. European Journal of Innovation Management, 16 (2), pp. 243–264.

Teece, D.J., Pisano, G., and Shuen, A. (1997). Dynamic Capabilities and Strategic Management. Strategic Management Journal, 18 (7), pp. 509–553.

Tushman, M.L., O’Reilly, C.A. (1997). Winning through Innovation: A Practical Guide to Leading Organizational Change and Renewal. Boston, MA: Harvard Business School Press.

Volberda H.W., Van den Bosch F.A.J., and Heij C.V. (2013). Management Innovation: Management as Fertile Ground for Innovation. European Management Review, 10, pp. 1–15.

Wood, J. (2018). FirstBuild by GE Appliances Expands Innovation Model Overseas. Available at: https://pressroom.geappliances.com/news/firstbuildTM-by-ge-appliances-expands-innovation-model-overseas (accessed August 2019).