Innovation Infrastructures to Transform the Mexican Internet Industry: The Case of the Startup Community

DISSERTATION

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by

Ruy Cervantes

Dissertation Committee:
Professor Bonnie Nardi, Chair
Professor Alladi Venkatesh
Dr. John C. Tang

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Curriculum Vitae

Ruy Cervantes


2005-06  Software Engineer. Satyam Computer Services, Chennai, India.

2010  M.S. in Information and Computer Science, University of California, Irvine.

2013  Ph.D. in Information and Computer Science, University of California, Irvine.

Field of Study

General Informatics

Publications

Refereed Conference Papers

Ruy Cervantes, and Bonnie Nardi. Building a Mexican Startup Culture Over the Weekend. ICIC 2012.

Ruy Cervantes, Mark Warschauer, Bonnie Nardi, Nithya Sambasivan. Infrastructures for Low-cost Laptop Use in Mexican Schools. CHI 2011.

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Doctoral Consortia

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Grants, Awards and Honors


UCLA Institute for Research on Labor and Employment, Grad Student Collaborative Grant, 2010.
Abstract of the Dissertation

Innovation Infrastructures to Transform the Mexican Internet Industry:

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Ruy Cervantes

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I conducted an ethnography of internet entrepreneurs building startups in Mexico. I selected this case as representative of how people engage in technology innovation in middle-income countries. The number of communities of internet entrepreneurs building startups in these countries is exploding, empowered by social media, cloud technologies, and new software frameworks and methodologies. However, while entrepreneurs in the main centers of innovation, such as Silicon Valley, have crucial social, cultural, economic, and material resources to build high-impact startups, these resources are often not present in middle-income countries. I define those resources as innovation infrastructures, stable and dependable resources necessary to systematically conduct technology innovation activities. Entrepreneurs in middle-income countries have a double challenge of excelling at their startups, and creating innovation infrastructures. Mexican entrepreneurs worked as a community to build innovation infrastructures such as technical and entrepreneurship interest groups, learning and networking
events, and diverse social media applications to connect with local and global networks of innovation. Combining these infrastructures, this community set off key learning processes to build a stronger startup culture in their country. I used a participant-observer approach, following entrepreneurs across a variety of online and offline locales. To understand the practice of building innovation infrastructures, I helped organize events and spaces to promote the startup culture in Mexico. My findings contribute to understanding technology innovation activities in middle-income countries, explaining how innovation infrastructures initiate key learning processes to create a strong startup culture. The understanding of these infrastructures provides a solid empirical foundation for designing technologies, initiatives, and policies to cultivate new innovation communities in new places and contexts.
Foreword

Mexico’s economy has been growing even in the midst of a global economic crisis. While the country was once marred by a mismanaged macroeconomic policy, it now has a stable, open economy. Its middle class has been growing, driving internal demand and building a more competitive professional class. China is not as competitive for manufacturing as it used to be, and European and US firms are shifting some production to Mexico, encouraging growth. Yet, Mexico has enormous challenges ahead. Large sectors of its population still live in extreme poverty. There is widespread corruption at all levels of society. Mexico’s war on drugs has led to an escalation of violence that has had great social and humanitarian costs.

It is crucial for Mexico not to rely on its current economic circumstances, which are subject to rapid change. The country should not rely on manufacturing to drive its growth. Instead, for Mexico to develop a stronger economic potential, it needs to create innovation-based industries. A recent study by Euromonitor International (2012) pointed out that despite the reemergence of Mexico as a manufacturing giant, the country is lagging in the creation of innovation-based products. There is no strong federal policy to strengthen the development of fundamental industries (Dussel Peters, 2011). Mexico imports many of the components of the electronics and appliances it consumes and produces. The same is true for Mexico’s software and internet industries, which are still mostly based on low-value-added services and not on delivering technological innovation. To increase the social and economic value of these industries, they must become innovation-based.

Here I present the case of a community of young people I followed from 2010 through 2012,
who were working passionately to create an innovation-based industry in Mexico. During this period I witnessed and participated in their activities and initiatives. Despite failing on many occasions, they continued to work towards their goals. Their work has started to bear fruit, and they experienced important successes during the study period. They realize they must continue to work with the same passion to consolidate their industry and become innovation-based.

In this dissertation I analyze the case of the Mexican startup community, which is transforming the country’s internet industry. The case illustrates how, in a country with little precedent for technology innovation, an industry can undergo transformation to become innovation-based. The Mexican startup community, fueled by a strong passion for technology innovation, sought to create profound economic, cultural, and social transformations to increase opportunities for development in their country. Their case may serve as a useful example for other communities facing similar challenges.
Section 1. Introduction and Context
Chapter 1. Introduction

Middle-income countries such as China, India, Brazil, and Mexico have a historic lack of high-tech innovation. Many people are seeking to transform this situation, especially entrepreneurs who aspire to create cutting-edge products such as those built in Silicon Valley. Entrepreneurs’ aspirations are fed by vivid stories of Silicon Valley startups. They read about innovative startups in blogs such as TechCrunch. They closely follow the development of these companies through outlets like Twitter. They pose questions on how these new products are implemented to technology experts who participate in question-and-answer sites such as Quora.

However, there is an unstated backdrop for these Silicon Valley success stories. Entrepreneurs in Silicon Valley rely on the many resources available to them, including personal social networks, technical and entrepreneurship communities, technology innovation events, and venture capital financing (Saxenian, 1996). In middle-income countries these resources are often unavailable (OECD, 2010). The business culture is conservative, discouraging cooperation and innovation (Kow, 2011; Saxenian, 2006; Takhteyev, 2012). Entrepreneurs have little access to venture capital, mentors, and contacts for reaching partners and clients (OECD, 2010). This lack of resources makes technology innovation in middle-income countries very difficult (OECD, 2010).

In this dissertation I analyze a representative case of how people outside of Silicon Valley create technology innovation in practice. To this end, I conducted an ethnography of internet entrepreneurs in Mexico creating innovative startups and hoping to create products with a global impact. I selected the Mexican case because it shows how people in middle-income countries are building innovation-based industries without direct access to Silicon Valley’s resources, and in the midst of profound global transformation of innovation activities. I found that the practices of
Mexican internet entrepreneurs were radically different from those of other entrepreneurs, even those who a few years back created high-technology startups in India and China (Saxenian, 2006). In those cases entrepreneurs first worked in Silicon Valley and then migrated back to their home country, bringing with them the practices and connections required for innovation activities. The Mexican entrepreneurs I studied had little firsthand experience in Silicon Valley. Instead, they combined new global and local resources, including social media applications, cloud technologies, new organizational forms, and low-cost travel, to learn innovation practices and connect to the global innovation networks.

*I argue that entrepreneurs in middle-income countries face a double challenge in realizing their aspirations: they must design and market innovative products, and they must create “innovation infrastructures” that support their practice.* I define innovation infrastructures as a set of stable and dependable social, cultural, technical, informational, economic, and material resources that afford systematic, effective, and efficient innovation. These infrastructures aid entrepreneurs in learning new innovation practices. Entrepreneurs leverage these infrastructures to connect with mentors, clients, and investors. They also use them to find potential cofounders, employees, and business partners.

My definition is based on Star and Ruhleder’s (1996) work on infrastructures. In their work, infrastructures are resources that undergird the shared practices of a certain group. Infrastructures must persist beyond a single event, standardizing practices across time and space (Star & Ruhleder, 1996.) Thus, innovation infrastructures must give continuity and stability to innovation practices, so entrepreneurs can rely on these practices to innovate systematically.

The Indian and Chinese entrepreneurs who returned from Silicon Valley brought key resources
to create the infrastructures necessary for innovation (Saxenian, 2006). Saxenian explained how in those cases, Chinese and Indian entrepreneurs introduced into their companies innovation practices they learned in Silicon Valley to create products for global markets. As they introduced these practices, they started to change the business attitudes and expectations towards technology innovation of their employees, investors, and other local entrepreneurs. Saxenian found that Chinese and Indian entrepreneurs used their Silicon Valley connections to access venture capital, mentors, and business partners. These global resources allowed the companies to accelerate their growth and consolidate their participation in global markets. Saxenian also found that these entrepreneurs started to create personal networks in their locality, following social practices they learned in Silicon Valley, to access local resources such as business partners, potential cofounders, and employees.

Migration to and from major centers of innovation was one of the driving forces for the creation of new industries in middle-income countries during the twentieth century (Abbott, 2003). People were the most effective medium to transport and diffuse the knowledge, practices, and connections necessary for the creation of new industries (Tuomi, 2006). This was especially true for innovation-based industries, which are knowledge intensive (Tuomi, 2006). The formation of the startup industries in China and India in the 1990s and early 2000s were fundamentally tied to the migration patterns of Indian and Chinese professionals, who for decades migrated to Silicon Valley, and then returned to their home countries to create startups (Saxenian, 2006). Saxenian demonstrated that that those migration patterns were crucial for India and China to develop deep connections within the global networks of innovation, especially with Silicon Valley. The strong personal networks between entrepreneurs in those Asian countries and their compatriots in Silicon Valley, were fundamental for Indian and Chinese startups to find investors, business
partners, and clients (Saxenian, 2006). Chinese and Indian professionals institutionalized those Silicon Valley ties, creating powerful entrepreneurship associations that have been key for the development of strong startup communities in their home countries (Saxenian, 2006).

In contrast, most middle-income countries do not have an established community of professionals working in Silicon Valley, and consequently lack direct connections with the main centers of innovation (Saxenian, 2006). This is the case for Mexico. While there are hundreds of thousands of Mexicans working in Silicon Valley in menial labor jobs, very few work in the IT and software industry (Alarcón, 2000; Zlolniski, 2006). Most qualified Mexican professionals stay in their country, as the Mexican economy has sufficient demand to retain them (Alarcón, 2000; Zúñiga & Molina, 2008). Mexican professionals tend not to be fluent English speakers, making it harder for them to find opportunities in the US (Zúñiga & Molina, 2008). Despite a recent increase in the number of Mexican professionals migrating to the US (Zúñiga & Molina, 2008) the total number is still low when compared with the number of Indian and Chinese professionals working in the United States (Alarcón, 2000; Saxenian, 2006).

However, I argue that new resources to innovate open new possibilities to create innovation-based industries in middle-income countries, even if these countries lack professionals who have returned home after migrating to Silicon Valley. These new resources to innovate include social media, internet technologies, cloud computing, low-cost travel, and new methodologies and practices for product development. An example of working out these new possibilities is the case of Mexican entrepreneurs, who have combined new resources to create innovation infrastructures that allow them to engage in technology innovation. These innovation infrastructures helped them to find alternative ways to learn innovation practices, as there were few people in their context from whom they could learn how to innovate. With these infrastructures they started to
create alternative pathways to connect with American business partners, clients, investors, and mentors. Using those infrastructures Mexican entrepreneurs created networks to tap into the talent and resources of their own location. The case I present here shows that while migration to and from centers of innovation will continue to be a fundamental force to create industries in new locations, those entrepreneurs who decide to stay in their home country now have a greater chance to succeed at creating products and companies with global potential.

Mexican entrepreneurs created innovation infrastructures to bootstrap an innovation-based industry in their country. I use the term bootstrap to emphasize that they are in an environment with scant innovation infrastructures, and little precedent and support for innovation activities. Bootstrapping is a term commonly used by Silicon Valley entrepreneurs to denote startup companies that initiate operations without external funding (Bhide, 1992, 2000.) Bootstrapping entrepreneurs must launch their startups with their own financial resources. I extend the usage of bootstrapping to denote how Mexican entrepreneurs must create their startups in an environment where they must build their own innovation infrastructures.

Mexican entrepreneurs are forming a community, which I refer to as the Mexican startup community. They seek to develop innovation infrastructures that assist startups to create the business connections they need for growth, and empower aspiring entrepreneurs to learn new innovation practices. The members of this community are continuously building innovation infrastructures. They have created diverse online spaces, such as forums and social news sites, to discuss how to create startups in Mexico. They have founded hackerspaces and coworking spaces, which are low-cost locations where entrepreneurs work and the community meets. They have hosted learning events that support entrepreneurs to learn new innovation practices from Silicon Valley and elsewhere. They have held formal events to increase the recognition of their
community both within and outside Mexico. They have organized networking trips to Silicon Valley to amplify their connections with American entrepreneurs and investors.

I will show that the main activity of this community seeking to effectively bootstrap innovation in Mexico was to transform the business culture and practices of their industry so it is conducive for technological innovation. They needed to transform the negative disposition towards innovation of the mainstream business culture in Mexico, where many historical, economic, and social situations have created an environment with few incentives for innovators. They needed to change the perception among Mexicans that technology innovation is too risky, and that there are not sufficient resources for it. They needed to overcome the mistrust that hinders cooperation among businesses in Mexico, a country where the historical formation of privileged groups and oligopolies has made business people reluctant to cooperate. (The implications of these challenges to innovation in Mexico will be analyzed in detail in Chapter 3.)

Mexican entrepreneurs are seeking to create and expand a startup culture in Mexico, with the aim of eventually transforming their industry towards becoming innovation-based. They want a large number of people in Mexico to embrace the culture of startups, which prizes the creation of innovative products that give great value to the user, puts emphasis on efficient and flexible organizations to create these products, and is ready to constantly learn and adapt. In this culture it is normal to collaborate within and across companies to create the greatest value for everyone.

The effort of this community to transform the culture and practices of their industry is very deliberate. Entrepreneurs reflect about specific needs and actions to change the aspirations, attitudes, values, and practices of people in their industry. They seek to enable an increasingly larger number of people to learn these practices and culture, to apply them, and to create startups.
They combine the innovation infrastructures they have built and the new resources to facilitate that learning process.

The community’s efforts to create a startup culture are often inspired by Silicon Valley’s practices and culture. However, while they admire Silicon Valley, they understand it is not possible to simply transplant its startup culture to Mexico. Rather, they leverage these foreign-inspired innovation practices to transform the people in their local context regarding attitudes, expectations, and disposition to innovate. They seek to create the conditions for Mexican entrepreneurs to work in new schemes of collaboration, continuous learning, and innovation. A growing number of entrepreneurs are experiencing this new startup culture in the events and spaces the community is creating. Yet, to create a startup industry with a global impact, the Mexican startup community must engage many more entrepreneurs and investors, and connect more deeply with global networks of innovation.

A strong community of innovators is key to foster efficient, effective, and systematic technology innovation (Ahuja, 2000; Florin, Lubatkin, & Schulze, 2003; Saxenian, 1996; Shan, Walker, & Kogut, 1994; Tuomi, 2006). The emergence of the startup community indicates that the process to bootstrap innovation in Mexico is underway. This community is building infrastructures that will accelerate the creation of new startups. Upcoming entrepreneurs can adapt these infrastructures to meet their particular needs. More importantly, the Mexican startup community is learning how to create stable innovation infrastructures. This community is experimenting with many different approaches to creating spaces, events, networks, and organizations. While only some of these efforts are successful, the startup community is generating and sharing knowledge of what works, and what does not work, in the Mexican context.
In this dissertation I will explain how entrepreneurs are using social media and face-to-face events to build the Mexican startup community. Combining these elements they are creating and strengthening the global and local connections they need to create innovation infrastructures. These new resources are enabling the Mexican startup community to learn innovation practices and participate in the global internet industry as creators of technological innovations—not just users of technology.

Mexican entrepreneurs are using social media to familiarize themselves with Silicon Valley’s innovation practices, and to organize their community. They regularly read internet industry blogs and social news sites. From these sources they learn about methods and techniques used to create innovative products and startup companies. Social media has been crucial for strengthening the local community. Mexican entrepreneurs use Facebook groups and mailing lists to efficiently organize events and meet-ups. They discuss how to create startups in Mexico in specialized forums. Many Mexican entrepreneurs use Twitter to initiate new business connections, and maintain current relationships in lively conversations.

Even if internet entrepreneurs are advanced users of internet technologies, they find that face-to-face interaction is irreplaceable to create learning experiences and meaningful connections. For instance, in the “Startup Weekend” innovation events entrepreneurs learn through practice important techniques for creating a startup. These events are powerful learning experiences where participants work on real projects and collaborate intensely in a highly collocated environment. Mexican entrepreneurs travel to networking events in Silicon Valley to expand their global business connections. At these events, Mexican entrepreneurs can initiate relationships with potential American business partners and investors.
1.1 Building Innovation Infrastructures to Bootstrap a Startup Culture

The main objective of my analysis is to understand how the Mexican startup community has been creating a startup culture by purposefully building innovation infrastructures. I will argue that to bootstrap a startup culture, entrepreneurs needed to build innovation infrastructures.

*Innovation infrastructures were constructed using technical and material resources, concepts, and social relationships.* Technical and material resources comprise social media technologies, internet and cloud computing technologies, physical meeting spaces, and the financial and funding resources necessary to conduct innovation activities. Conceptual resources include aspirations, visions, narratives, practices, models, methodologies, rules, and habits of mind necessary to guide people when realizing innovation activities. Social relationships are comprised of business and personal relationships between entrepreneurs, developers, designers, engineers and other technically oriented people, investors, and officials of various institutions who support each other in their innovation activities. Throughout this dissertation I will analyze how entrepreneurs combined in practice all of these resources to form innovation infrastructures.

To exemplify how the definition of innovation infrastructures becomes operational, I briefly explain how multiple resources are required to build an online entrepreneurship forum that becomes an innovation infrastructure. To create the forum, entrepreneurs require diverse internet technologies, including the forum software and servers. But technical resources alone are not sufficient. The forum requires the participation of members who have a common vision of why they should use that forum, who are willing to support each other, and who follow the rules for a productive conversation. The online forum becomes an innovation infrastructure when technical, social, and conceptual resources all converge to create a stable place where entrepreneurs can
routinely get useful feedback.

Building and sustaining infrastructures that support innovation activities is a long process requiring strong collaboration and commitment (Engeström, 2008; Tuomi, 2006). To analyze the work of building innovation infrastructures I studied the process longitudinally and across different locales. To transform the internet industry in Mexico, the startup community needed to commit in the long term to build and maintain innovation infrastructures. I observed that often the responsibility of creating innovation infrastructures relied on the enthusiasm of a small number of members. The challenge for the community is to develop mechanisms to motivate and empower more participants to enter the activities of the community. The community needs to grow and diversify its membership to ensure its long-term development.

**1.2 The Urgent Need for Further Research in Technology Innovation and Startups in Middle-Income Countries**

We need research to design policies, institutions, and technologies that can catalyze the positive social and economic outcomes of innovation industries in middle-income countries, and minimize the potential negative consequences. This research must come from a variety of perspectives to have a broad, holistic understanding of the economic, social, and cultural implications of building innovation-based industries in middle-income countries. My work contributes towards this end, analyzing the processes required to build a startup culture in a middle-income country, at a time when entrepreneurs have new resources to create startups, and the emergence of new industries is less dependent on migration patterns.

Successful startups create new role models for the younger generations of these countries, and
increase their chances to develop their careers and aspirations (Saxenian, 2006). This change helps transform negative business culture and practices, which perpetuate the social and economic inequalities in these countries (Saxenian, 2006). Having a greater diversity and number of people involved in technology innovation would yield more, and better, solutions for many of the problems of humanity (Tuomi, 2006).

Startup communities are now rapidly emerging all over the world. The Startup Genome project recently issued the results of a global survey of internet entrepreneurs (Lasse Herrmann, Marmer, Dogrultan, & Holtschke, 2012) to determine the maturity of startup communities across the world. The report showed an explosion of startup communities in many middle-income countries including Latin America, the Middle East, South East and South Asia, and some African countries including South Africa, Kenya, and Ghana. The report found consolidated startup communities in only three middle-income countries: Bangalore in India, Santiago in Chile, and Sao Paulo in Brazil. Those three centers are special cases: Sao Paulo and Santiago have had unique governmental support for decades (Lacy, 2011), and Bangalore has strong ongoing connections with Silicon Valley (Saxenian, 2006).

However, most of the startup communities in middle-income countries are far from consolidated (Lasse Herrmann et al., 2012). It is urgent to understand how to bolster the growth of these emergent startup communities to become solid and successful. While there are many contextual differences across these emerging startup communities, I infer that the greatest challenge to consolidating these communities is for entrepreneurs to transform their business culture and practices to allow greater innovation. I make this inference from the findings of innovation researchers in two other middle-income countries, Kow's (2011) study of Chinese videogame modders and Takhteyev's (2012) study of Brazilian developers in a small city. These researchers
described how the historical, social, and cultural conditions hindered technology innovation. Many of the problems that Brazilian and Chinese innovators faced with their local business culture were similar to those experienced by Mexican entrepreneurs, including a generalized risk aversion and perception of innovation as being too difficult, as well as a lack of trust which impeded cooperation in business.

Most of the research that exists on innovation in middle-income countries comes from an economic perspective (e.g., World Intellectual Property Organization, 2011). While this perspective is very important, other perspectives are necessary to understand how to potentiate the positive outcomes of the global emergence of startup communities. An economic approach can provide only limited data for this phenomenon, as emergent startup communities are still learning how to participate in the global system of innovation, and their economic impact is often not yet visible. Much more research is needed to identify the processes behind the formation of these emergent startup communities, and ways in which their development can be supported.

1.3 Thesis Organization

The first part of this dissertation, which includes this introduction, sets up the context to understand the conditions in which the Mexican startup community emerged and the significance of its efforts. In Chapter Two I examine the existing challenges to bootstrap innovation in middle-income countries and how these conditions are changing thanks to a set of new social and technical resources. In this chapter I also review the literature related to this dissertation. In Chapter Three I survey how the historical, cultural, and social context of Mexico impedes the efforts of entrepreneurs to start creating technology innovation. The concepts and phenomena described in these first three chapters are used in the rest of this dissertation to analyze how
Mexican entrepreneurs overcame the difficulties to build innovation infrastructures.

In the second part of my dissertation I present the bulk of my findings, analyzing the efforts of the Mexican startup community to create innovation infrastructures. In Chapter Four I detail my research methods, and how these methods helped me to understand the innovation practices of Mexican internet entrepreneurs. Chapter Five focuses on the social media infrastructures the startup community created to give a greater cohesion to and expand the reach of the Mexican startup community. These social media infrastructures were difficult to maintain, as it was hard to create a self-sufficient community around them. Such difficulties reflected the complexities of innovating in a country with little precedent for this activity. In Chapter Six I analyze the role of face-to-face events in building the Mexican startup culture. I focus on the case of the Startup Weekend events, which enabled the community to create deep learning experiences where the participants experienced how their innovation activities could be transformed.

In the third part of my dissertation, I synthesize the findings of my research. In Chapter Seven I analyze how the community’s innovation infrastructures come together in practice to facilitate the innovation activities, reviewing the case of an entrepreneur who experienced partial success in building his startup. In Chapter Eight I analyze the key learning processes allowing the community to create a startup culture in Mexico and transform its industry. These processes became possible thanks to the innovation infrastructures that the community has been building. I discuss how we can cultivate the emergence innovation-based industries in middle-income by creating innovation infrastructures.
Chapter 2. Technology Innovation in Middle-Income Countries

In the last two decades there has been a dramatic increase in technology innovation in middle-income countries. The World Intellectual Property Organization (2011), which is the United Nations agency for technology innovation and intellectual property, linked this increase to new social and technical resources that have materially transformed the conditions for innovation in middle-income countries. These resources include social media and internet informational sites, greater global mobility of people, new tools and techniques for development and production of new technology, and scalable production and distribution platforms.

Before these resources were widely available, only high-income countries had the equipment, capital, expertise, and people necessary for creating technology innovation. New resources have made the process of developing technology more affordable and practical in middle-income countries. Students, skilled workers, scientists, and entrepreneurs have upgraded their expertise and connections to participate in innovation activities.

The historical, social, cultural, and economic context encourages—or inhibits—entrepreneurs to use these new resources for innovation. Context is the fulcrum on which the effectiveness of these new resources teeters. For instance, social media can enhance entrepreneurs’ ability to discover new contacts such as potential business partners and mentors. Knowing in advance whom to contact, entrepreneurs take full advantage of networking events and mutual acquaintances. Yet, the ability to leverage these opportunities to connect is determined by the local social and cultural rules.

At the same time, entrepreneurs are catalyzing changes in their local context using new information and social media resources. Previously, learning innovation practices and creating
global connections was facilitated only by migration flows. Now entrepreneurs regularly learn about new techniques and methodologies using information resources on the internet. Social media help entrepreneurs understand how to access global innovation networks that previously were opaque to them. Gradually, entrepreneurs transform their local business culture by using these resources to change their practices.

Saxenian (2006) found that the Indian, Chinese, Israeli, and Taiwanese immigrant communities in Silicon Valley were crucial for the emergence of those nations’ high-tech industries. For several decades, large numbers of engineers and managers from those countries migrated to Silicon Valley for work. During the 1980s the emigration of these workers to the US was seen as a pernicious “brain drain,” depleting Asian countries of valuable human resources (Todaro, 1981). These immigrants created strong formal and informal organizations that enabled their compatriots to swiftly connect to innovation networks in Silicon Valley. During the 1990s and the 2000s large numbers of skilled workers returned home as high-tech entrepreneurs. Saxenian (2006) named this pattern “brain circulation,” highlighting the positive effect that these migrants’ return had on the development of their nations.

The historic, cultural, social, and political context of the countries Saxenian (2006) studied facilitated brain circulation. For instance, migrants of Indian origin have historically learned to maintain strong family and friendship ties while away from their motherland (Xiang, 2006). Strong ties helped Indian entrepreneurs who returned home after many years to set up companies taking full advantage of the local resources, while also having access to the resources of Silicon Valley (Saxenian, 2006). The stable political environment of India allowed entrepreneurs to continue their relationship with their home country. This contrasts with other immigrant communities in Silicon Valley such as Iranians, who have not been able to create innovation-
based industries in their country due to the economic and political embargoes imposed by the West (Saxenian, 2006).

Saxenian (2006) explained that the Indian startup community began to flourish when software export to the US became practical in the 1990s. At this point their migratory context converged with a high demand for software in the US, along with availability of high-speed internet connections and a business-friendly regulatory framework in India. The returned entrepreneurs continued to work with their Silicon Valley partners and investors using email, phone, and low-cost travel. In fact, they traveled so frequently to the US that the flight almost felt like a commute. Their capacity to make valuable business connections was amplified by the strong professional networks of Indians in Silicon Valley.

The lack of Mexicans working as professionals in the high-tech industry in Silicon Valley contrasts starkly with the high number of professionals of Indian origin working there (Alarcón, 2000). According to Alarcón (2000) there are several factors why “immigrants from Indian and Mexico who reside in the United States, do not represent a cross-section of the societies of their countries of origin. The professionals among the Indians and the unskilled workers among the Mexicans are overrepresented.” First, the migration policies of the United States until the 1980s favored the migration of Mexican laborers to work in agriculture and menial jobs. Alarcón (2000) explained that geographical proximity “lessened the selection process by lowering the economic and social costs of immigration” for low skilled Mexicans. Parthasarathy (2000) explained that for people of Indian origin, no similar policies were in place, making their professional skills the only viable path to migrate to the US. Second, the policies around the IT industry in India helped to create a strong industry and train countless “global software engineers” who were highly qualified in different technologies—and had a strong command of
the English language (Parthasarathy, 2000). According to Alarcón (2000), the situation was different in Mexico, where the government favored the creation of a strong manufacturing electronics industry geared towards the export of electronics to the US. Thus historically most qualified Mexican IT professionals stayed working in the software services and manufacturing electronics industry in Mexico, which offered competitive pay (Alarcón, 2000). This caused little incentive for Mexican professionals to migrate to Silicon Valley.

With few direct connections to Silicon Valley, the early members of the Mexican startup community began to use social media and informational resources to learn about that center of innovation in the late 2000s. They were quick to implement new software development frameworks and methodologies for product creation, using imported techniques. At the same time they sought to increase their business contacts with Silicon Valley and to create new connections with entrepreneurs at home. For these Mexican entrepreneurs internet resources were, and have continued to be, a major channel through which to learn new work practices.

While informational resources and social media are important levers to initiate connections with Silicon Valley, face-to-face contact is still essential to solidify effective business connections. Diverse studies have shown that face-to-face, collocated interactions are the most effective means to create the shared context and trust necessary for a productive business relationship (Mark, 2002; Nardi, 2005; G. M. Olson & Olson, 2000; Venolia et al., 2010; Whittaker, Frohlich, & Daly-Jones, 1994). During their long-term presence in Silicon Valley, Indians developed strong, trusted contacts that helped them to secure funding, sign partnerships, and acquire customers systematically. With far less presence in Silicon Valley, Mexican startups have been at a disadvantage to engage more deeply with Americans.
The process involved in bootstrapping innovation varies according to the context. Takhteyev (2012) studied the coding practices of Brazilian software developers. He observed how developers learned about novel techniques and software from Silicon Valley thanks to the internet. Yet, sometimes the local infrastructures did not support the use of global resources. For instance, the rigid organizational culture of some companies, reinforced by local social and cultural practices, was incompatible with new software methodologies that required a less hierarchical organization.

My aim in this chapter is to locate the case of the Mexican startup community in the larger landscape of technology innovation. I describe how the context of middle-income countries interacts with global resources when creating technology innovation. I present the concepts and prior work that will guide my analysis in later chapters, characterizing universal patterns as well as context-specific contingencies of technology innovation activities.

2.1 Challenges to Innovation in Middle-Income Countries

Middle-income countries are those that have achieved a mid-level of gross national income per capita (World Bank, n.d.). These countries have reached an acceptable quality of life for a substantial part of their population, but still have large sections of the populace living in underdeveloped conditions. The development of these countries is far from a linear process towards progress, but rather a multidimensional and non-linear process towards achieving socioeconomic development (Ayala Martínez & Pérez Pineda, 2009). They have historic and structural deficiencies that they must resolve to avoid the “middle-income trap” (Griffith, 2011), a term used to describe the systematic inability of some of these countries to reach a higher level of socio-economic development.
The development of middle-income countries requires global cooperation and has global benefits. Their rapid growth rates have been driving the global economy in recent years, even in the face of a downturn in most high-income economies (Ayala Martínez & Pérez Pineda, 2009; Kharas & Gertz, 2010). The popular press hails middle-income countries as the economic powerhouses of the twenty-first century. O’Neill, Walton, Potter, and Leme (2001) coined the term BRIC to refer to the high-growth middle-income countries Brazil, Russia, India, and China, and this term is now widely used in the press. Several years later, O’Neill et al. (2007) updated their analysis, arguing that eleven countries—ten middle-income including Mexico, and one low-income—combined with the BRIC countries would rival the seven largest high-income countries in economic importance by the middle of this century.

The economic growth of middle-income countries has been propelled by the rapid expansion of their middle class, which is key for achieving full social development and economic modernization (Bhalla, 2009; Castañeda, 2011; Court & Narasimhan, 2010; Kharas & Gertz, 2010). As a larger portion of society becomes middle class, the workforce becomes increasingly educated. Middle-class families put strong emphasis on education as a tool for social mobility (Banerjee & Duflo, 2007). Thus, there is a larger cohort of trained people who can work in innovation-based industries (Arora & Gambardella, 2005). The emerging middle class of these countries is avid for innovations that respond to its particular needs (Court & Narasimhan, 2010). Entrepreneurs can create products that satisfy the internal demand and use these markets as a launch pad to access global markets.

To achieve full economic and social development, middle-income countries must upgrade and diversify their economic activities to include innovation-based industries (OECD, 2010). Most of their economic activities—including agriculture, mining, manufacturing, and services—tend to
be low value added (OECD, 2010). In low-value-added industries, most of the value of the final product comes from raw materials, not labor and intellectual property. These industries provide low-paying jobs and have little room for professional development. Low-value-added industries are unlikely to achieve rapid growth. Governments, universities, and businesses in these countries are working to create innovation-based industries that produce high-value-added products and services (World Intellectual Property Organization, 2011). When successful, most of these industries achieve high growth.

The IT and internet sectors are fundamental for the consolidation of strong innovation-based industries in middle-income countries. Yet, these sectors are still focused on low-value-added services such as outsourced IT support, customizations of pre-packaged software, and tailor-made software for local clients (Arora & Gambardella, 2005; OECD, 2010). The Brazilian developers that Takhteyev (2012) studied felt that the software they produced was unexciting, as it was destined for local and narrow use. In contrast they considered that the software created in Silicon Valley was exciting, as it was intended for broad and global use. Takhteyev articulated the sentiment these Brazilian developers had as “If you want your software to be used widely in Brazil, you should write it in Silicon Valley.” This perception gives “Silicon Valley tremendous symbolic power in the world of software development” (Takhteyev, 2012). Often developers in middle-income countries give little credence to their own capacity to generate important products, believing that only in Silicon Valley is it possible to build high-impact products.

Still, many entrepreneurs in middle-income countries believe that it is possible to create high-impact startups outside Silicon Valley, which then become the building blocks of new innovation-based industries in their own countries (Saxenian, 2006; Wadhwa, Saxenian, Freeman, Gereffi, & Salkever, 2009). Startups are an opportunity to develop a strong, indigenous
technology innovation capacity (Saxenian, 2006). Research shows that technology startups drive
Economists and public-policy scholars have argued that startups have a greater ability than larger
corporations to build radically new innovations that can transform economic and social practices
(Acs & Audretsch, 1990; Baumol, 2002). For this reason, Acs and Szerb (2006) argued that
middle-income countries should implement policies that encourage the formation of startups.

China and India are developing sizable internet startup communities (Lacy, 2011; Saxenian,
2006; Wadhwa et al., 2009). They have an increasing number of investors specialized in high-
growth companies (Jensen & Heesen, 2010; Wright, Pruthi, & Lockett, 2005). Several internet
startups have achieved commercial success, such as Alibaba and TenCent in China, and FlipKart
and RedBus in India (Lacy, 2011; Saxenian, 2006). In other middle-countries such as Brazil,
Colombia, Indonesia, and Mexico, startup communities have just recently begun to emerge. The
number of startups and specialized investors in these countries is growing fast, but few have
achieved commercial success. Building startup communities is difficult, so it is unknown in
which of these countries the internet industry will thrive.

There are many challenges for creating innovation-based startups in middle-income countries
(Abbott, 2003; Saxenian, 2006). Entrepreneurs face adverse social, cultural, and material
conditions for creating new businesses. Tight government control over private businesses,
widespread corruption, and deficient physical infrastructures including unreliable power, bad
roads, and costly telecommunications are a reality in middle-income countries (Saxenian, 2006).
The industrialization process that started in these countries during the last century—and is still
taking place—has created unsuitable infrastructures for an innovation-based economy (Abbott,
2003). Industrialization requires a stable environment, with low-cost production inputs and labor.
The business and investment culture it cultivates tends to be conservative, unwilling to take the kinds of risks that technology innovation entails (Acs & Szerb, 2006). In contrast, creating innovation-based industries requires infrastructures that provide a dynamic environment conducive for learning, the creation of new knowledge, and taking calculated risks. These industries require knowledge workers ready to learn and experiment, investors able to support technology development projects, and networks that enable innovation (Saxenian, 1996).

In the US and Western Europe, middle classes are seen as the major drivers of entrepreneurship (Landes, 1999). Banerjee and Duflo (2007) conducted a large-scale survey of middle-class members in middle-income countries, finding a generalized perception of entrepreneurship being risky and difficult. Instead, the respondents of that survey preferred steady, well-paying jobs. I will argue that the adverse conditions for innovation in middle-income countries are responsible for the negative perception of entrepreneurship among the middle classes.

2.2 Social and Technical Resources for Innovation

The means of production in innovation-based industries are fundamentally different from those of the industrial era (Engeström, 2008). Industrial-era companies use efficient, but often rigid, mass production methods supported by assembly lines, mechanization and automation, mass distribution, and a steady supply of low-cost labor. Innovation-based companies, by contrast, must collaborate with partners and consumers to create value, using flexible production processes and new organizational patterns (Engeström, 2008).

The internet and software industries are the foremost example of innovation-based companies. They create products that are highly malleable to user needs, and do not require intensive capital investment, especially when compared to manufacturing industries. Innovation-based companies
often design their offerings as platforms that can be directly consumed or customized to create new products that cater to the needs of specific niche markets (Gawer, 2009). Designing platforms allows multiple parties to collaborate in a process of continuous innovation, creating greater value for all. For instance, internet product companies release an early version of their platform to get customer feedback. The user feedback is quickly integrated into new versions of the platform. Frequent updates constantly evolve the platform. Independent developers and startups create extensions of the platform or combine multiple platforms to create new products.

The production process that brings together companies, partners, and customers has been studied under the rubrics of “user innovations” (Von Hippel, 2005), “open innovation” (Chesbrough, 2006), and “co-configuration work” (Victor & Boynton, 1998). Information and communication technologies (ICTs) are crucial for this new production practice as they enable multiple parties to coordinate and exchange information efficiently and at low cost (Hagel, Brown, & Davison, 2010). As innovation-based industries continue to experiment with new production processes, they will continue to push forward the development of new technologies and methodologies.

I distinguish three main kinds of resources revolutionizing internet entrepreneurship. First, the new technical platforms, techniques, and methodologies simplify and lower the cost of creating and distributing software products. Second, social media and information resources have streamlined the capacity of entrepreneurs to collaborate and learn from people within their organization and outside of it. Third, new kinds of social spaces, events, and organizations leverage the power of face-to-face interactions for entrepreneurs to nurture their communities and innovation networks.
2.2.1 The Lean Startup Movement

Silicon Valley entrepreneur Eric Ries (2011) coined the concept “lean startup” to encompass technical platforms, techniques, and methodologies suitable to build new products and services rapidly and with minimal resources. Ries argued that all these resources make it possible to reduce to a minimum the time and capital needed to design products that fit the needs of the market. Lean startups systematically integrate user feedback at each stage of the development of the new offering. Historically, lean startups emerged in the software and internet industry, as it is easy to quickly transform the products and services of these companies to integrate user feedback. Yet, Ries (2011) has argued that increasingly other industries are incorporating the principles of the lean startup movement, as more rapid prototyping tools and techniques emerge.

Ries (2011) argued that by following the lean startup principles it is possible to dramatically lower the risk of creating a product that nobody wants. Ries was directly inspired by the lean production movement (Holweg, 2007) that proposes a series of manufacturing techniques perfected in Japan to create the greatest value with the minimum of waste. A less direct but equally important influence for lean startup is the availability of user innovations and open innovation research programs. This approach places emphasis on user feedback to create the greatest value.

There is a strong, worldwide movement of technology entrepreneurs who adhere to the lean startup proposition. This movement has gained currency as the most effective methodology for product innovation in the internet and software industry, and is the de facto methodology for entrepreneurs in Silicon Valley. As a consequence of its popularity in Silicon Valley, many of the Mexican entrepreneurs I studied adhered to this movement.
Lean startup practices are strongly viable for internet and software products where technologies have dramatically lowered the costs of producing software. Modern web development frameworks allow programmers to create complex web applications very rapidly, at a low cost. Internet platforms have lowered the upfront costs to use powerful computational resources, and have simplified the access to new channels of distribution for products. “Cloud computing” dynamically provisions computing infrastructure, enabling the deployment of highly scalable web applications. It dramatically reduces the capital investment for building a reliable and scalable computing infrastructure because it is charged as a utility, rather than a one-time expenditure. This allows small startups to deliver dependable services (Talukder, Zimmerman, & Prahalad, 2010). Some of the most popular commercial platforms for internet startups are Amazon Web Services, Rackspace Cloud, Microsoft Azure, and Google App Engine. APIs (application platform interfaces) allow programmers to integrate into their products the powerful computational infrastructures of large providers such as Google Maps, Facebook, and Twitter. “Marketplaces” and “application store” platforms such as those created for Android, Apple, and Microsoft smartphones have simplified the distribution of software for mobiles (Gonçalves, Walravens, & Ballon, 2010).

A series of methodologies have created more flexible processes for developing software products. Agile methodologies, proposed by Beck et al. (2001), allow the development of software in rapid iterations, incorporating user feedback at each stage. Agile methodologies, inspired by lean production methodologies, are a good fit for lean startups (Ries, 2011). The Customer Development methodology proposed by Blank (2005) guides entrepreneurs to iteratively create products that fit the market needs. Customer development allows entrepreneurs to find the technical requirements of the product, and the marketing strategy to commercialize it.
2.2.2 Social Media as a Resource for Innovation

Social media and informational resources are enabling new innovation practices to travel to new locations much faster. This has reduced the distance between entrepreneurs in middle-income countries and those in Silicon Valley. Goggins and Mascaro (2012) characterized the distance between knowledge workers in main centers of innovation and those located in peripheral locations as having geographical, cultural, and informational dimensions. Geographical distance measures the spatial distance from one location to another. Cultural distance measures the differences between social and work practices between locations. Information distance measures the differences in access and proficiency when using various information resources.

We can use Goggins and Mascaro’s distance concept to reflect about technology entrepreneurship in middle-income countries. The internet’s rich business and technical knowledge resources have reduced the information distance between entrepreneurs in these countries and Silicon Valley. Developers have available a wealth of technical documentation on blogs, wikis, and electronic books that enables them to start learning the basics of how to create internet products. Before the internet the access to technical information was very limited in middle-income countries, as imported technical books were rare and expensive, and local editions were often outdated. Question-and-answer platforms such as Stack Exchange (www.stackexchange.com) and Quora (www.quora.com) allow developers to find experts who can help them with highly specialized questions, and give them advice on important technical decisions (Mamykina, Manoim, Mittal, Hripcsak, & Hartmann, 2011).

The desire of entrepreneurs in middle-income countries to create Silicon Valley-style startups manifests a reduced cultural distance from that main center of innovation. Reading articles,
opinions, and comments in blogs and social news sites allows entrepreneurs to understand the practices and values of Silicon Valley. They read blogs such as TechCrunch (www.techcrunch.com) to follow important developments of the global internet industry, including the launch of new products and platforms, the rise of promising startups, important mergers and acquisitions, and surprising company failures. Reddit.com and Hacker News (news.ycombinator.com) are the most important social news sites for global internet startups. Their membership is heavily composed of individuals based in Silicon Valley. Entrepreneurs in middle-income countries benefit from participation in these social news sites, often only as readers, as it opens a window for them on what Silicon Valley thinks about a particular issue.

2.2.3 New Organizational Resources for Innovation

Entrepreneurs around the globe are hosting new kinds of events and social spaces to create stronger business connections and promote the adoption of new innovation practices (Lacy, 2011; Saxenian, 2006). When they design these face-to-face interactions they seek to induce peer-to-peer learning exchanges and open-ended conversations. Meeting face to face is ideal for these interactions as it facilitates creating affinity and building commitment between parties (Nardi, 2005). In informal technical “meet-ups” developers create groups that help each other deepen their knowledge, legitimize their practice in the eyes of other local organizations and companies, and build an individual reputation. Hackerspaces and coworking locations serve as meeting points for startup communities, promoting formal and informal collaborations among entrepreneurs. Formal events such as entrepreneurship conferences give startup communities a greater global visibility and help individual startups to make key connections.

Formal organizations that promote entrepreneurship are fundamental for creating stronger
innovation networks (Lacy, 2011; Saxenian, 2006). Such organizations—which include non-profits, formal networks, business accelerators, seed-stage funds, venture capital, and investor clubs—allow entrepreneurs to access key resources including capital, connections, and mentorship. Their presence in middle-income countries legitimizes technology entrepreneurship as a viable business paradigm in the region. These organizations also promote a constant flow of information and people that support the introduction of innovation practices.

Originally, some of these organizations were created by Silicon Valley immigrants. For instance, The Indus Entrepreneurs (TiE) and Mount Jade Science and Technology Association promote ties between that center of innovation and India and China respectively (Saxenian, 2006). Other organizations have been created by entrepreneurs seeking to create global networks, with no particular ethnic group in mind. The non-profit Endeavor is based in New York and has branches in many middle-income countries. Sandbox is a network of young entrepreneurs around the globe who support each other with important contacts. Financial organizations including banks, venture capital, and seed funds are also playing a fundamental role in the creation of global networks of innovation. For instance, the Silicon Valley Bank, which has branches in India and China, enabled startups in those countries to consolidate their financial operations. Seed-stage funds such as Mexican VC and Startup Factory, and venture capital funds such as Alta Ventures, all operating in Mexico with a mix of US and Mexican capital, provide upcoming entrepreneurs with mentoring and the capital to grow their business.

Appadurai (1996) studied how migration and media enable resources and practices to travel across a globalized world. In Appadurai’s formulation, flows of people and information unintentionally transform culture. However, I argue that entrepreneurs skillfully design interactions that combine different kinds of resources to facilitate powerful learning and
networking experiences. Their intention is to enable more people to experience new ways of working and behaving. As a result, they are able to collectively create new concepts that make it possible to transform their current practices (Engeström, 2001) to be more conducive for technology innovation.

2.3 Studying Innovation Infrastructures

To study innovation infrastructures it is crucial to understand the context in which they are created. Innovation is fundamentally a social achievement (Tuomi, 2006). While the personal effort and talent is necessary, it is the social context that provides the necessary resources for innovation.

Every inventor, even a genius, is always the outgrowth of his time and environment. His creativity stems from those needs that were created before him, and rests upon those possibilities that, again, exist outside him… No invention or scientific discovery appears before the material and psychological conditions that are necessary for its emergence are created. (Vygostky, 1930; cited in Van der Veer & Valsiner, 1993)

Innovations become useful only when they address the needs of social practices in a specific context. Innovators’ work is supported by technologies, methodologies, and material means that were created by others before them, and their creativity is nourished by the experiences they have had in the environment they live in.

I follow the suggestion of Star and Ruhleder (1996) to study infrastructures as relational entities, embedded in a social context. For these authors the appropriate question to ask is not what resources are infrastructures, but rather, when do resources become infrastructures. For an
entrepreneur who is seeking funding, venture capital is an infrastructure that allows him to obtain financial resources—but for the manager of that venture capital, the fund is her object of work rather than an infrastructure. Depending on the context, a resource can be enabled as an infrastructure or not. The contact networks in Silicon Valley are an infrastructure for entrepreneurs to obtain resources for their company, as the cultural norms allow sharing contacts. In more secretive business cultures contact networks are not an infrastructure as the norms do not encourage sharing. In my research I seek to understand the process by which people use a collection of resources to transform them into infrastructures that support innovation practices.

Two important analytical distinctions stem from the fact that infrastructures are relational and embedded in a social context. First, infrastructures are inseparably related to the history of the communities they support (Bowker & Star, 2000; Engeström & Ahonen, 2002; Star & Ruhleder, 1996). Engeström and Ahonen (2002) explained that “communities need infrastructures to exist,” because infrastructures give communities the material basis on which they can act together. The evolution of the community is reflected in the development of infrastructures. An established, vibrant community will have solid infrastructures; an emerging community will have less reliable infrastructures because they are still being built. Communities must cooperate intensely to build and maintain their infrastructures, continuously negotiating how to serve a variety of users (Bowker & Star, 2000; Engeström & Ahonen, 2002). Thus, the empirical data where I observe how startup communities emerge are the observations of how entrepreneurs build innovation infrastructures. The entrepreneurs who collectively design and negotiate innovation infrastructures form the startup community. As these infrastructures enable the startup community to act together, the community builds its sense of identity.

The second distinction is that infrastructures are embedded in “other structures, social
arrangements and technologies” (Star & Ruhleder, 1996). Innovation infrastructures interact with the larger cultural, social, economic, and material conditions in which they are embedded. A community creating new infrastructures must take into account the possibilities and deficiencies of existing infrastructures. Entrepreneurs in middle-income countries must work around or transform infrastructures that are ill suited for innovation-based industries, such as the educational system and the financial system.

2.3.1 Comparing Innovation in Different Contexts

We must investigate the consequences of innovation-based industries for the development of middle-income countries. Nardi, Vatrapu, and Clemmensen, (2011) advocated for comparing how ICTs are used in practice across different social, cultural, and economic contexts. Those authors argued that such comparisons would enable us to “generate nuanced, critical understandings of technology in human life in the world we inhabit together.” Due to the social and economic importance of technology innovation, we must analyze it from multiple disciplines and in multiple contexts. Comparing how this activity happens in practice will allow us to design better technologies and policies that potentiate the benefits of innovation around the globe.

Yet, most of what we know about innovation comes from studies conducted in the US and Europe (e.g., Saxenian, 1996; Tuomi, 2006). While the body of literature on technology innovation in middle-income countries is growing, it concentrates on India and China (e.g., Parayil & D’Costa, 2009; Saxenian, 2006). Saxenian's (2006) landmark study on startups in India, China, Taiwan, and Israel is a major point of comparison and inspiration for my dissertation. Her work allowed me to compare the development of communities in China and India creating their innovation infrastructures, and leveraging Silicon Valley infrastructures.
Another fundamental point of comparison for my analysis is the emerging body of literature of knowledge work practices in middle-income countries (Irani, Dourish, & Mazmanian, 2010; Kow & Nardi, 2011; Takhteyev, 2012; Tang et al., 2009). These studies come from the Informatics, Human Computer Interaction (HCI), and Computer Supported Collaborative Work (CSCW) disciplines. Their analytical methods are inspired by a series of foundational studies such as those conducted by Nardi (1996), Suchman (1987), and Winograd and Flores (1986), which considered ICTs as being embedded within a social, cultural, and material context that shapes their uses and outcomes. With this perspective, during the 1990s and early 2000s a series of workplace studies were conducted in the US and Western Europe (Bowker & Star, 2000; Heath & Luff, 2000; Nardi & O’Day, 2000; Orr, 1996). Those studies became ingrained as basic assumptions of CSCW and HCI, often treated as universal, despite being based only in observations in high-income countries. The emergent body of literature on middle-income countries challenges those assumptions, investigating the differences, commonalities, and relationships between knowledge work across cultures. Takhteyev (2012) showed how context variations often make it difficult to adapt resources created in high-income countries into middle-income realities. Irani et al. (2010) highlighted the difficulties that workers in middle-income countries face when accommodating collaborations with clients in high-income countries. Kow and Nardi (2011) studied Chinese developers producing mods (software extensions) for a popular multiplayer online game. They found that Chinese developers were culturally and socially tied to teamwork configurations fundamentally different from those assumed to be optimal in high-income countries. Tang et al. (2009) conducted a cross-cultural study comparing email usage across a global organization, sampling branches across seven geographical regions. They found statistically significant differences in email use between regions, showing how local
Another strand of pertinent literature for my analysis is the subset of the ICT for Development (ICTD) literature that analyzes the IT and software industries in developing countries (Carmel, 2003; D’Costa, 2011; Nicholson & Sahay, 2007; Parayil & D’Costa, 2009; B. Parthasarathy & Aoyama, 2006). Avgerou (2010) argued that researchers must warn against the “falsity of widely held technology-deterministic expectations that ICTs, by virtue of its technical properties, will have this or that development effect.” Many ill-informed public policies have been implemented on the assumption that IT industries will automatically bring comprehensive development for a country (D’Costa, 2011). For instance, the Indian IT industry despite having generated great wealth still provides uneven development opportunities. There are large sections of the population lacking access to the educational system that would allow them to enter into this industry (D’Costa, 2011).

2.4 Conclusions

Innovation-based industries are more viable in middle-income countries thanks to new technologies that have dropped costs of technology innovation, and the increased global flows of people and information. In the 1990s and early 2000s migration back from Silicon Valley was a major factor in the growth of technology startups in India and China. Such was not the case for Mexico and many other middle-income countries without skilled migrants. Now social media are accelerating the entry to networks of innovation of people in countries that previously had little access to these networks. These new resources are fundamentally transforming how technology innovation happens. The revolutionary possibilities that social media and cloud technologies are creating for entrepreneurs to engage in technology innovation, echo the profound social and
economic transformations facilitated by the adoption of personal computers at home and in small businesses in the last two decades of the twentieth century (Venkatesh, 1996). Yet, when personal computers arrived at the home and the office, people required magazines, online publications, user groups and local experts to harness the full potential of these devices to transform their work activities (Nardi & O’Day, 2000; Venkatesh, 1996). Similarly, entrepreneurs must work to create the appropriate social context to take advantage of these new resources, building innovation infrastructures they need to facilitate the emergence of innovation-based industries. Bolstering the growth of innovation-based infrastructures can leverage the development of the entire nation. However, middle-income countries must transform their social and institutional structures, otherwise the benefits of innovation-based industries will remain marginal. Informatics and its related disciplines provide an important perspective to understand technology innovation practices. My analysis can be used to inform the design of environments and policies expand innovation-based industries.
Chapter 3. Challenges to Technology Innovation in Mexico

In this chapter I survey the historic challenges that the startup community in Mexico must overcome to bootstrap innovation. I explain why Mexico has been an economy with few incentives for technology innovation. Then I explore the social, cultural, and economic consequences of a society that is based on privilege rather than merit. Finally, I assess the emergence of the Mexican middle class as an asset for the transformation of the culture and practices of the entire country.

Mexico’s socioeconomic development has been challenged by aspects of its historic, cultural, social, political, and economic situation. The country suffers from a strong social inequality, with powerful special interest groups such as monopolies and privileged unions that have slowed down many necessary reforms (Bartra, 2005; Elizondo Mayer-Serra, 2011). Historically, the educational and research systems have been characterized by uneven quality and access, whereby large sections of the population have been underrepresented (López-Acevedo, 2006). The economy has been based on oil exports and manufacturing, with scant infrastructure to support innovation-based industries (González-Brambila, Lever, & Veloso, 2007).

However, Mexico is experiencing large-scale transformations that open possibilities to modernize its society and economy, and achieve greater socioeconomic development (Castañeda, 2011). Mexico has relatively stable economic and political systems (De La Calle & Rubio, 2010). The country has started, slowly, a democratization process with the election of an opposition president in the 2000 election after 70 years of rule by a single party (Elizondo Mayer-Serra, 2011). Even though the PRI has come to power again to power in 2012, the social, judicial, and economic context has radically changed, demanding a more accountable and
transparent government (Castañeda, 2011). Mexico’s middle class is growing rapidly, is increasingly educated, and aspires to systematically improve its standard of living (Castañeda, 2011; De La Calle & Rubio, 2010). This milieu is increasingly producing professionals qualified to work in innovation-based industries (Castañeda, 2011; De La Calle & Rubio, 2010).

### 3.1 An Economy with Little Incentive for Innovation

In an edited volume on the role of technology and innovation in Mexico’s development, Bazdresch Parada and Meza González (2010) characterized the pessimism of the economic establishment towards technology innovation:

> We must recognize that for a long time the economic establishment of the country, particularly in the government, thought that Mexico could not—and maybe should not—engage in innovation activities. It was often repeated that “true” innovation was reserved for first world scientists and business people. “How? Innovation in Mexico? It is not possible... The conditions are not present...”

For many decades the risks associated with innovation deterred businesses and government from doing more than merely importing or copying technology. As a result, the country’s innovation system is not competitive at a global level. Indicators such as number of patents per person, and expenditure of the gross national product on research and development are among the lowest in the Organization for Economic Co-operation and Development (OECD, 2010), which groups the world’s largest and most advanced economies.

González-Brambila et al. (2007) analyzed how the emphasis on exploiting the country’s abundant natural resources has created few incentives for technology innovators. Oil exports still
represent an important percentage of the gross domestic product. Between the 1930s and the 1980s Mexico had a closed economy and put great emphasis on exploiting natural resources. Trade was heavily regulated, there was little foreign investment, and imports were restricted. The government implemented an “import substitution” policy, banning the import of many products in an effort to protect the economy. This policy sought to induce Mexicans to create their own technology, but was ineffective as it was not complemented by strong investment in research and education. The government’s limited resources were directed towards more pressing needs such as health and basic education. By contrast, other middle-income countries such as Brazil and India implemented similar import substitution policies and also invested heavily in research. These countries developed strong higher education and research institutions during that period (Saxenian, 2006; Takhteyev, 2012).

During the 1990s Mexico entered a strong period of economic liberalization. The country was opened to foreign investment, signing multiple free trade agreements and streamlining governmental regulations over businesses. Mexico became one of the largest exporters of manufactured goods worldwide, taking advantage of low-cost labor and proximity to the US.

However, the liberalization process and the subsequent entry of multinationals were not sufficient to ignite an innovation-based economy in Mexico. Dussel (1999) explained that the electronics industry brought important economic development, and that a generation of engineers, managers, and companies were trained in the new manufacturing technologies and methods needed to service the multinationals. Yet, Dussel explained that this industry was not able to create the people networks from which a solid productive base and an indigenous, innovation-based industry could emerge. He explained that while there were incipient efforts in the 1990s on the part of the government to enable the electronics industry to enter into the global
networks of innovation, those efforts lacked long-term commitment and the necessary coordination between industry, government, and universities to create a fundamental transformation in the industry to become innovation-based.

In the last decade Mexico’s institutions have begun making efforts to attend to the needs of innovation industries (Bazdresch Parada & Meza González, 2010; González-Brambila, 2008; Valenti Nigrini, 2008). Public investments in research and innovation have been steadily increasing, with the federal government creating grants for collaborations between industry and academia, credits for investing in new technology, and tax breaks (González-Brambila, 2008). The reach of these programs is still limited, as funds allocated are relatively small, and it is complex for small startups to fulfill the federal requirements. Nevertheless, González-Brambila (2008) asserts that these initial experiences have trained “a new cadre of people” who can now implement more efficient technology innovation programs in the public sector.

3.2 Special Privileges Disincentivize Cooperation and Innovation

Privileged groups such as de-facto monopolies and oligopolies, corrupt political cliques, and dishonest sectors of workers’ unions have been a constant burden for Mexico’s development. Their presence engenders systemic corruption, deters cooperation in business, and discourages technology innovation. Elizondo Mayer-Serra (2011), a political scientist, argued that the historically privileged groups have made Mexico a very conservative society. To avoid losing their position, the privileged have held back many reforms and slowed the transformation of institutions that could make the country more competitive. For Elizondo Mayer-Serra, the telecommunications and banking sectors are prominent examples. Due to lack of competition among telecommunications companies, the cost of internet and mobile access remains high in
comparison with many other countries. The banking system has been slow in giving credit to small businesses. Until very recently, it has not participated in the creation of solutions for online payments, hindering the ability of internet entrepreneurs to create new products.

These privileged groups, formed by *specific* business people, politicians, bureaucrats, and union members, have historically supported corrupt governments and companies in exchange for special favors. The history of a privilege-based society can be traced back to the Spanish Colonial period, when the government favored some groups to increase the incipient state power. Its present configuration took shape in the Mexican Revolution of 1911, which historically caused the great majority of Mexicans to be mistrustful of the elites (Bartra, 2005; Elizondo Mayer-Serra, 2011). Mexicans tend to strongly resent living in a country rich in resources, from which they have received very little (Nexos, 2011), a feeling particularly marked among the emergent middle class (De La Calle & Rubio, 2010).

In a privilege-based society most people have little incentive to create innovative companies, as they perceive that those with privileges have an unfair business advantage (Elizondo Mayer-Serra, 2011). While in every country connections are important, in Mexico there is a generalized perception that only the privileged can enter the most profitable industries such as telecommunications and companies serving the public sector. These special privileges are linked to a high degree of corruption in the public and private sectors. The popular saying “el que no tranza no avanza,” roughly translated as “to get ahead you must scam,” denotes how corruption seems inescapable for many Mexicans. Business people feel that they will have to bribe someone or ask a special favor at some point, if they want to be successful (Elizondo Mayer-Serra, 2011).
In this environment many Mexicans are wary to cooperate with each other. Their lack of cooperativeness is characterized by the cultural metaphor of “cangrejismo,” roughly translatable as “crab-ism.” The behavior of business people is perceived to be similar to that of crabs trapped in a bucket, pulling each other down instead of cooperating to get out of the trap. Several indicators show that the lack of trust in collective endeavors goes beyond a mere perception. Reyes Heroles (2008) reported that philanthropic organizations are rare in Mexico. In the US there are 2 million registered non-profit organizations and in Chile, much smaller than Mexico, there are 35 thousand. In Mexico there are only 8.5 thousand registered non-profits. A large-scale mixed methods study on the values and attitudes of Mexicans published by Nexos (2011), one of the most respected political magazines in Mexico, showed that 86% of respondents had “individual, but not collective aspirations.” The same study showed that 63% of respondents agreed that “Mexicans go their own way,” as opposed to working together.

Castañeda (2011), former Mexican Foreign Minister and political science scholar, argued that the lack of cooperativeness of Mexicans is rooted in the long history of authoritarian regimes that have impeded the rise of an organized civil society. The Spanish Colonial government had a large bureaucracy and tight controls on economic and social activities, affording little room for indigenous civil society organizations to emerge. More recently, Mexico experienced a de-facto single-party dictatorship under the PRI party, which ruled for seven decades, from the 1930s to the year 2000. During that period civil society was unable to organize, because there was little maneuvering space beyond the party. Thus, in Mexico there is little tradition around organizing outside of the government. Another important factor is that Mexico’s wealth and property was historically concentrated by a very small group of people, who configured the law and politics for their own benefit. In a situation where most people were poor and destitute, it was impossible
to have a healthy civil society. During many years Mexico “lacked the material basis, namely the political and judicial context to sprout, grow and flourish” (Castañeda, 2011).

Many participants of today’s incipient democracy are working to create stronger institutions, and a more organized civil society. The electoral system is an example of this; although far from perfect, it is much more trustworthy than it was a few decades ago. The challenge for Mexicans is to create stronger institutions that are able to create fair conditions for all citizens. Mexicans must eliminate special privileges and corruption, building checks and balances into the new democracy they are constructing (Elizondo Mayer-Serra, 2011).

3.3 Lack of Support to Achievers, Lack of Support to Innovation

López-Acevedo (2006), an educational researcher, argued that Mexico’s educational system has produced uneven results in educating people for innovation-based industries. The root causes of this deficient system are the lack of a merit-based educational system that would encourage students to give their best effort, along with the historical lack of access by unprivileged groups. Elizondo Mayer-Serra (2011) observed that entry into colleges and universities is not based on competitive examinations. Public universities provide spots not for the best students, but for those attending the high schools controlled by these universities. In Mexico, many high schools are part of the public university system rather than being under the Ministry of Education. Most private universities are open to anyone who can afford them. In a non-meritocratic system there are limited economic resources to support elite institutions that produce world-class research. The system produces few competitive graduates and personnel. González-Brambila et al. (2007) found that although the scientific and engineering research community is productive in terms of quality publications per researcher, its size is small when compared with the size of the country.
In contrast, India has invested heavily in its higher education and research systems since its independence in the 1950s, creating a series of world-class, elite scientific, engineering, and management institutes, colleges, and universities, including the prestigious Indian Institute of Technology. These public institutions are reserved for the best students in the country.

Originally, elite institutions sought to train scientists and engineers who would design technology for India, and allow the import substitution program to work. However, the closed economy policies and import substitution programs did not bring the expected economic development. Few successful indigenous technology innovations came out of these programs. Yet, once India opened its economy, the pool of highly trained technical talent became one of the principal drivers of the rapid growth of the country’s high-tech industry (Saxenian, 2006). D’Costa (2011) argued that while the rise of the Indian IT industry has been astounding, the government has neglected manufacturing industries, which would provide massive sources of employment and opportunities for the lower classes. For this reason D’Costa cautioned to maintain a balance between supporting innovation-based and manufacturing industries.

The privileged groups and the State failed to support a Mexican research and innovation system. During many years there was no support for the highest achievers in science, technology, and innovation. This systemic absence of support for the highest achievers is one reason why Mexico lacks a tradition of world-class research programs. Marcos Moshinsky, one of the most famous and accomplished Mexican physicists and professor at the National University of Mexico, ironically characterized the State lack of support for the highest achievers:

Any Mexican who has demonstrated capacity in his work is automatically a privileged person. Public institutions should forget about these individuals to concentrate on those
Moshinsky argued that the State—fearing being considered elitist—wrongly withdrew support for accomplished artists, professionals, and scientists to continue working towards higher achievements. Moshinsky experienced this lack of support from public institutions for his own scientific endeavors. He also witnessed a systematic lack of support for other accomplished scientists. More recently, the influential Mexican cultural anthropologist Roger Bartra (2010) argued that Moshinsky’s observation is still valid. The cynical populism practiced in Latin America—an ideology that falsely dichotomizes “the people” against “the elite”—is the root cause of this problem. This ideology has been used in several historical moments by corrupt officials to mobilize the public in an authoritarian top-down process, giving a false sense of commitment to popular causes (Kampwirth, 2010). For Bartra this cynical populism is still “deeply rooted in the culture, in the customs, and the habits that imbue the political life of Mexico.” The Mexican people are accustomed to the manipulations of populist governments. Many Mexicans practice “clientelism,” seeking to obtain short-term benefits from populist governments including special privileges, however small, in exchange for their vote. It will be very difficult to change these practices, and make the entire society demand their rights using democratic participation.

The Mexican Revolution official discourse and practices sought to close the inequality gaps in society. Large estates were distributed among dispossessed peasants, and a public education system was created to educate the masses. The Revolution was in principle a movement to better the conditions of the great majority of rural Mexicans who lived under poverty. However, too often this support was granted from within the logic of a privilege-based society, prone to top-down populism and corruption. After the revolution, the incipient government sought to gain
support and stability through clientelism, granting concessions to agrarian organizations and unions that would cooperate with the government. Many government officials granted special favors to specific businessmen in exchange for supporting the regime or for bribes.

In the post-revolutionary regime where support was subject to discretionary rules, merit was worth little. The official discourse dictated that any State support should be granted to the masses. Official programs supporting high achievers did not have a place under this logic. In practice high achievers represented only a small minority who did not serve to consolidate the political power of post-revolutionary leaders, thus the importance of supporting them was overlooked (Bartra, 2010; Moshinsky, 1986).

3.4 Mexicans Have an Inferiority Complex? Not Really

Some Mexicans perceive that the lack of technical innovation can be explained by an inferiority complex stemming from the deeply traumatic Colonial period, a war with the US in which they lost half of their territory, and a brutal internal Revolution. Ramos (1972) in a classical sociological study of Mexicans—now strongly contested—argued that this supposed inferiority complex led Mexicans to self-defeating attitudes. While these attitudes may hold true for specific individuals, this perception is often used as a simplistic explanation for Mexico’s lack of achievements on the world stage, including creating technology and triumphing in sports. For instance, many sports commentators and fans maintain that while the Mexican soccer team has strong athletic ability, it lacks the self-confidence to triumph in international competitions.

The conception of “Mexican ingenuity” present in the popular imagery reflects this alleged lack of self-confidence Mexicans have in their innovation capacity. In this conception, Mexicans see themselves as resourceful people who can work with very limited resources. Yet, the concept
carries a derogatory meaning, in that Mexican ingenuity creations are perceived as being of lower quality, and prone to failure. For instance, car mechanics routinely make repairs with makeshift parts, instead of expensive replacements that would be too costly for many consumers in Mexico. Such repairs demonstrate resourcefulness, but they are not dependable solutions. This cultural conception resonates with Takhteyev's (2012) observation of Brazilian developers’ belief that only Silicon Valley can create high-impact software.

Yet, many cultural manifestations in Mexico express a strong desire to become competent and self-confident. Continuing with the soccer analogy, a popular chant of the Mexican team is “Si se puede,” translated as “Yes we can.” Mexican internet entrepreneurs have a strong desire to overcome self-limiting attitudes. In an entrepreneurship panel at an important event of the Mexican internet industry, a panelist explained that “what Latin Americans [and Mexican startups] need [to create great startup companies] is to believe that they can.” Mexican entrepreneurs are drawing from many different cultural manifestations to create the business environment they require.

Thus, the supposed Mexican inferiority complex is not inescapable, and it is not a fundamental characteristic of national identity. Bartra (2005) argued that what Ramos saw as a trait of Mexican culture was rather a condition experienced by many other nations undergoing a modernization process. In addition, it is a construction that does not fully correspond to reality. In the process of characterizing the Mexican identity, many scholars falsely reduced the image of the nation to a few traits that served to create a myth of “The Mexican Problem.” This myth centers on negative cultural images such as the lazy indigenous farmer and the deceitful mestizo city dweller. It serves as an excuse to hide the failures of government and the privileged groups to drive Mexico’s progress and modernization. As Bartra (2005) strongly argued, “the image
[that many scholars have created] of a Mexican was a metaphor of permanent underdevelopment, the image of a frustrated progress.” Bartra demanded that this image be transformed, as it obscured the reasons behind Mexico’s lack of socio-economic development. While these cultural–historical conditions might have been present in some individuals at specific moments, they should not be considered as universal. Instead we must understand that Mexicans construct their identity, practices, and institutions drawing from vast cultural sources. The country is constituted by thick layers of history and culture that have created a very diverse society.

Nonetheless, Mexico does have many contradictions to solve before advancing to a greater development, notably social inequality. To overcome these painful contradictions scholars and practitioners should look into potential structural and cultural changes that can enable the overall development of society. These reflections can be used in turn to design public policies and socio-technical infrastructures that enable or modify this social development. While helping a group of people to achieve their maximum potential will not by itself solve Mexico’s contradictions, creating such opportunities will propel the development of the country. Younger generations of Mexican innovators must have opportunities to develop their ambitions in positive and constructive activities that benefit society.

3.5  A Possibility to Transform: The Emergent Middle Class in Mexico

The logic of privilege-based groups and populism emerged at a time when the country’s population was mainly rural, poor, and uneducated. The middle class was small, with a strong component of state and unionized workers who benefited from the status quo. In recent years Mexico became a middle-class and urban society for the first time in its history (Castañeda,
2011; De La Calle & Rubio, 2010). Yet, as almost half of the population continues to live in poverty, this transformation is fragile.

The middle class seeks reforms, not abrupt changes, which improve their social and economic development. De La Calle and Rubio (2010) argued that the Mexican middle class is rejecting the populist measures of past regimes, limiting the pernicious effects of a privilege-based society. A sign of this transformation is the sharp increase among the middle class of independent voters, those who do not identify with a single party. Yet, Castañeda (2011) argued that while the middle class has the potential to fully modernize the values, institutions, and practices of the country, it must develop a greater capacity to work collectively. Castañeda considered that the pervasive individualist behavior must be left behind. Mexicans must work together to create institutions required to build sustainable economic and social development.

Castañeda (2011) and De La Calle and Rubio (2010) attributed this growth to the convergence of economic stability, a mediocre but steady economic growth, and a demographic window where the majority of the population is economically active. Another contributing factor is the remittances of Mexicans working in the US and Canada, which have allowed many rural families to move up the social ladder (Castañeda, 2011). The expansion of the middle class in Mexico must be studied in the context of the expansion of the global middle class (Castañeda, 2011; see also Kharas & Gertz, 2010). The local factors in Mexico have converged with global forces, especially benefiting those participating in the new economy. With this strengthened position, the middle class has dramatically increased its access to personal and housing credit, which was not available a few years ago (De La Calle & Rubio, 2010).
The middle classes are defined by their patterns of consumption, not only income and occupation (Castañeda, 2011; De La Calle & Rubio, 2010; Franco, Hopenhayn, & León, 2010). Franco et al. (2010) argued that the Latin American middle classes, including those of Mexico, are broadening their consumption thanks to the falling costs of goods, and their increased global connectedness. For instance computers and other ICTs were very expensive in the region due to the intrinsic high cost of these technologies and prohibitive import taxes. As both cost and taxes have lowered, these ICTs have become affordable to most members of the middle class. This has created a dramatic increase of internet connectivity in Mexico. In 2012 there were 40 million people connected to the internet in Mexico, double the number in 2006, with more than a quarter of these people accessing from home (Asociación Mexicana de Internet, 2012). Another important indicator of the connectedness of Mexicans is the increase in foreign travel. In 2008 there were 3 million Mexicans travelling by plane to foreign countries, doubling the proportion of Mexican travelers in the last two decades (De La Calle & Rubio, 2010).

Most Mexican internet entrepreneurs belong to the independent worker and upper middle-class segments, and tend to have greater skills, connections, and aspirations for creating high-growth business. However, there is mobility within middle-class segments as all put emphasis on education. Many sons and daughters of unionized workers have access to education that will enable them to participate in an innovation-based economy. From a consumption perspective, the lower cost of computing and internet resources makes internet entrepreneurship accessible to most youth of middle-class families. These young Mexicans have access to information and computing resources similar to that of their counterparts in the US, Europe, and Asia.
3.6 Discussion

Mexico is at a crossroads in building an innovation-based industry. The new local and global resources can help the country overcome the challenges from old institutions and practices. The emergence of a middle-class society can create a culture emphasizing education and merit. While the startup community in Mexico is having initial experiences that are foundational towards creating an entire industry based on innovation, there is a long road to create a full transformation. Mexican entrepreneurs must create collective aspirations to build strong innovation-based industry that benefits all, beyond the mistrust of “cangrejismo.”

In the coming years we will be able to determine how initial experiences of new ways of working translate into the required large-scale transformation. For this colossal transformation, entrepreneurs must not only create new innovation infrastructures, they must transform the entire business context. They must transform the network of pernicious institutions that perpetuate the lack of a meritocracy, as well as the corruption that hinders the development of Mexico (Elizondo Mayer-Serra, 2011). I am hopeful that the great rewards of creating these new industries in Mexico will continue motivating entrepreneurs to achieve a full transformation of their industry. While helping a group of people to achieve their maximum potential will not by itself solve Mexico’s contradictions, I agree with Moshinsky (1986) that creating opportunities for the highest achievers can propel the country’s development. Younger generations must have opportunities to develop their ambitions in positive and constructive activities. D’Costa (2011) cautioned against being naively optimistic about innovation-based industries: the socioeconomic differences between those who are qualified for the new economy and those who are not are widening rapidly. Thus, it is urgent to create mechanisms to ensure equal access to higher education for all members of society in order for everyone to benefit from innovation-based
industries. Enabling more members of society to participate in these industries will contribute to overcoming the social inequality in Mexico. Scholars and practitioners should look into potential structural and cultural changes that can enable the overall development of society. These reflections can be used in turn to design public policies and socio-technical infrastructures that enable or modify this social development.
Section 2. Findings
Chapter 4. Methods of an Ethnographic Study of the Startup Community

In this chapter I explain the methods I used in my ethnographic study. I conducted the bulk of the fieldwork between October 2010 and October 2011, following specific cases until July 2012. I continued to be engaged with the startup community when writing this ethnography.

I used the analytic and methodological approaches of developmental research (Engeström, 2001; Kaptelinin & Nardi, 2006; Vygotsky, 1978) and comparative informatics (Nardi et al., 2011). Combining these two approaches I synthesized how innovation emerges in a middle-income country, and what factors in this process are similar or different across different contexts. Using the developmental approach, I was able to follow the origin and evolution of the innovation bootstrapping process within the Mexican startup community. I focused my research on understanding the process by which individuals and the entire community acquired specific innovation practices, and created innovation infrastructures. Using the comparative approach I contrasted the differences and commonalities of the Mexican startup community with other startup communities around the world.

I followed a participant-observer strategy, becoming intimately familiar with how the startup community learned and conducted innovation practices. My degree of participation varied at different moments of the research, from being an outside observer to being a more central participant, organizing diverse community events. While at some points I became deeply involved with the activities of the community, I never lost academic rigor. I maintained a detailed documentation of my participation, taking extensive field notes at every event, formal and informal, that I attended. I noted down the people who were participating in the activities of the community, the kinds of interactions that they had between themselves and with me, and the
actions in which I was involved during those activities. In my field notes I also captured the different artifacts used by the participants, and the discourse they employed in their interactions. I took extensive video footage of my participation in many of the events, and later analyzed it to cross-validate and enrich my field notes. Video was helpful to capture impromptu conversations and record specific integrations between the participants. Without taking video it would have been very difficult to capture these conversations and interactions in any detail. I always requested the permission of the participants to be captured in video, and after finishing filming I offered to delete the footage if they felt uncomfortable in any way with what was captured.

This deep participation allowed me to collect data from multiple points of view, to conduct a thorough, holistic analysis. I always disclosed my identity as a researcher. I conducted fieldwork in a variety of locales, following a multi-sited ethnography strategy (Marcus, 1995). Bootstrapping technology innovation was a process best observed across multiple sites, as the startup community was highly mobile and drew resources from multiple locations. I combined fieldwork in face-to-face and online situations, taking elements of ethnography in virtual settings (Boellstorff, Nardi, Pearche, & Taylor, 2012). I remained aware that the startup community seamlessly combined both kinds of interaction.

In this chapter I discuss in greater detail how I applied the developmental and comparative approaches in my research. I explain the requirements to conduct an ethnographic study in contemporary settings. I detail the characteristics of my fieldwork, and how I used specific research strategies. I discuss my involvement with the startup community and its implications for the research. Finally, I record the methodological details of different moments of my fieldwork.
4.1 *A Developmental and Comparative Approach to Ethnography*

Bootstrapping of technology innovation is a large-scale process that evolves over time. In it, many variables interact with each other. A rigorous and scientific study of bootstrapping technology requires a holistic approach, in which all the interactions can be observed. Looking at each variable separately would miss many important interactions. Kaptelinin and Nardi (2006) explained that “when analyzing developmental changes one cannot limit the analysis to isolated variables, because the relationship between these variables can change over the course of development.” To be able to distinguish the roles of the multiple variables and their interactions, the developmental approach consists in identifying “the germ” of the studied phenomenon, namely “the most basic initial form that already has the important features of the analyzed phenomenon” (Kaptelinin & Nardi, 2006). Once the germ is identified it is necessary to track its transformations into more developed forms, following the trajectory of the individuals and the entire community where the phenomenon takes place (Kaptelinin & Nardi, 2006).

The developmental method comes from the Cultural Historical Activity Theory (CHAT) tradition, which evolved from the concepts of the Russian developmental psychologists Vygotsky (1978) and Leontiev (1974). The CHAT perspective seeks to study how human activities evolve in a historical and cultural process. Early in the twentieth century, Vygotsky (1978) created Cultural-Historical psychology, where the developmental approach was first described. A few years later Vygotsky’s student Leontiev (1974) evolved the theory, creating Activity Theory, describing how human activities are organized. Both perspectives have been combined into CHAT, which has become a mature analytical framework for workplace studies (Engeström, 2001), HCI, CSCW, and Informatics (Kaptelinin & Nardi, 2006; Nardi, 1996).
Ethnography is well suited to provide the data that the developmental approach requires (Engeström, 2005; Kaptelinin & Nardi, 2006). The objective of an ethnography is to build a holistic analysis of social practices and culture, “linking together materials from a large corpus” (Boellstorff et al., 2012). The ethnographic data I collected allowed me to empirically observe technology innovation bootstrapping innovation processes. Being in the field for an extended period of time—over a year—allowed me to observe significant changes in the community. I traced the first appearance of diverse innovation practices within the startup community, and followed their evolution over time. I observed the infrastructures that the community built to consolidate specific practices and how these infrastructures evolved. I also observed how and why some practices failed to be adopted and some infrastructures crumbled.

I combined a number of sources to understand the development of the bootstrapping process. I observed how entrepreneurs conducted innovation practices such as product development practices, software development practices, and marketing practices. I observed changes in the discourse of entrepreneurs in their face-to-face and online interactions. For instance, I observed how entrepreneurs learned specific technologies and innovation practices, at both the individual and the group level. To do so, I observed over twenty formal and informal events where entrepreneurs learned new practices. I conducted interviews with entrepreneurs, asking how and from whom they learned specific technologies, methodologies, and models, and opening the subject of their appreciation of their own professional development and the development of the startup community as a whole.

Another source of data for observing the development of how innovation practices are acquired was my own learning process. Kelty (2008) noted that one of the best instruments for an ethnographer observing how a culture influences people, is the changes in himself. This occurred
for me. While participating in community activities, I learned—but did not master—many innovation practices, such as networking practices, product development practices, and some technical practices. Other ethnographers such as Keller and Keller (1996) have used observations on their own learning process to discover subtle mechanisms that are difficult to appreciate without practical engagement of the subject matter. In my field notes I reflected about my learning process, noting how I developed proficiency in certain innovation practices, and the discourse I employed while talking with others. For instance my field notes reflect that the first time I participated in a hackathon creating a new product with a team I was unsure how to validate our design assumptions. In subsequent events, I learned many practices to validate those assumptions rapidly and efficiently, to the point where I was advising other aspiring entrepreneurs on how to validate their projects. I must stress that I did not do research “on myself.” I compared multiple points of view, including my own point of view as a participant.

Finally, to understand the bootstrapping process in a greater social, cultural, and historical context, I located the efforts of the startup community within the context of innovation in Mexico. I synthesized diverse scholarly sources coming from multiple disciplines, as detailed in Chapter 3. The historical perspective allowed me to analyze how the internet industry practices represent new ways of doing business compared to the historically prevalent business culture in Mexico. Thus the historical context gives a broader temporal dimension to the developmental approach. While my direct observations allowed me to understand the development of the startup community, considering historical sources provided a perspective on what the formation of the community can represent for the development of Mexican society.

The comparative method allowed me to contrast the bootstrapping innovation process of the Mexican startup community, with the processes of other startup communities. As I wrote this
ethnography I compared my findings with those reported in rich accounts of other startup communities, seeking to understand what features were similar and different. While I used a number of sources, some accounts were especially useful for my comparative process including Saxenian's (1996) study on the emergence of the startup community in Silicon Valley, and her later account of the startups communities of China and India (Saxenian, 2006), as well as the account of Takhteyev (2012) on software developers in Brazil. In Chapter 2 I list other important scholarly sources that I used in my comparison.

4.2 The Role of Ethnography and the Ethnographer

During the late nineteenth and early twentieth century, the early ethnographers went to remote countries to study exotic cultures (e.g., Malinowski, 1978). They created interpretations that would help their own people, Europeans and North Americans, to understand the ‘Other’, the members of foreign cultures. Later traditions of ethnography in these high-income countries, for instance the Chicago School (e.g., Becker, 1963; Whyte, 1943), started using ethnographic methods to understand the practices of their own society. More recently, the concept of the “native ethnographer” emerged to designate ethnographers who came from non-high-income countries and studied their own cultures and their own people (e.g., Haniff, 1985). In this sense, I am a native ethnographer, as I seek to study the practices of people within my own culture and social class. My cultural, social, and academic experiences are very similar to those of many of the Mexican professionals I studied. I obtained my bachelors in computer engineering at a private Mexican college, so I can relate to the academic and technical background of these entrepreneurs, many of whom attended private and/or public colleges to study engineering. Yet, my role as an ethnographer is not limited to documenting the practices of my culture. Rather, I
seek to discern the role of my culture and my society in the larger global context, and to contribute to the conversation on how we can develop our global society and culture.

In a globalized world it becomes very apparent how culture and social practices are created by the flows of people and information between locations (Appadurai, 1996; Hannerz, 1996). Ethnography has evolved from its origins of studying exotic and isolated cultures in remote sites, to become the study of how culture advances in a global context and how diverse cultures are related to each other. To this end, ethnographers have created more fluid conceptions of where they conduct fieldwork. Instead of studying a single site and ignoring its connections to the world, new methodological approaches such as multi-sited ethnography (Marcus, 1995) and comparative informatics (Nardi et al., 2011) seek to find how large-scale social and cultural phenomena occur in the uneven surface of a globalized world. Adding a broader intellectual perspective, the ethnographic method is now regularly conducted by researchers from varied disciplines such as science and technology studies, marketing, design, and my own field of HCI, CSCW, and Informatics (Boellstorff et al., 2012; Faubion & Marcus, 2009).

The development of the ethnographic method has radically changed the role of the ethnographer. As the ethnographer conducts research inside an office, a laboratory, and the local neighborhood, he or she weaves relationships with the participants that are “more balanced or even reversed,” than when studying exotic cultures (Rabinow, Marcus, Faubion, & Rees, 2008). The role some ethnographers sought was—and in many cases still is—to give a “voice” to the people of exotic, oppressed cultures who had scant means to be heard by people higher up the socioeconomic ladder. Many ethnographers conducting research in contemporary settings find that they do not need to speak for others. Kelty (2008), while conducting an ethnography of free software culture, found that his participants, computer geeks and free software advocates, were very vocal and
articulate, and had a strong facility to engage with the public debate. Kelty wrote: “The superalterns [referring to the geeks] can speak for themselves.” The “superaltern” is a neologism invented to contrast with the term “subaltern,” used to denote the natives in a lower position to whom the ethnographer was giving a voice. Kelty argued that instead his role as ethnographer of the contemporary was to “argue” with the superalterns about their creations, the technologies, institutions, values, and sociotechnical systems that they worked on. Engeström (2006) made the argument that to respond to the profound transformations of work practices in our globalizing world, the role of the researcher must be transformed. For Engeström, researchers must, “without compromising theoretical ambition and empirical rigor,” dialog with society to create new interpretations of reality, to participate in the creation of new meanings, and to design tools, technologies, institutions, and systems to overcome the challenges of our world.

This ethnography is an effort to dialog with members of innovation-based industry communities, and with other communities including academics and policy makers. I would like to reflect with the innovation community about their experiences with bootstrapping technology innovation in Mexico, to bolster their own process. I would like to reflect with the broader community on how to create new approaches to nurture dynamic innovation-based industries elsewhere, benefitting more societal sectors.

4.3 Following the Mexican Startup Community

The Mexican startup community is heterogeneous and not neatly located in a single geographical location in Mexico. They interact both online and face-to-face, and creatively combine local and global resources. To study them, I had to conduct fieldwork in a variety of locales. Using the terminology of Marcus (1995), I was “following the people” across different geographical
locations, venues, and online spaces.

I made observations and conducted interviews at a range of startups, from recently formed to mature companies, to understand how innovation practices and infrastructures are used. I did fieldwork in different online spaces to understand how they became infrastructures; this is how these resources became stable and dependable enough for entrepreneurs to use them systematically to conduct their innovation activities. I followed the activities of specific groups and persons, both online and face-to-face. Online fieldwork was crucial to understand how the members of this community maintain close connections with each other, and with other locations such as Silicon Valley. Finally, to understand how the communities create innovation infrastructures, I performed extensive observations and participated in the activities of a range of entrepreneurship and technical communities.

Much of my fieldwork occurred online. I followed specific cases of online spaces created by the community, for which I give methodological details later on in this section. Besides these cases, my fieldwork spanned the complex combination of media that the community used to communicate and be informed including Twitter, Facebook, blogs, social news sites, mailing lists, and IRC chat rooms. I participated in lively conversations about technology entrepreneurship with members of the community across these different kinds of media. Almost daily, I read blogs and social news sites of the global startup community, such as TechCrunch (www.techcrunch) and Hacker News (news.ycombinator.com). These materials allowed me to share the same context as the members of the startup community, as they made constant reference to articles and news appearing in these sites.

Other ethnographers studying software developers have reported combining fieldwork online and
face-to-face (Kow, 2011; Takhtayev, 2012). According to these descriptions and my observations, both developers and internet entrepreneurs skillfully combine interactions over the internet with face to face encounters. Takhtayev (2012) explained, “the virtual spaces in which developers collaborate with each other are normally understood by the participants as being fundamentally a part of the same reality as their face-to-face interactions.” In plain terms, if I had restricted my fieldwork only to face-to-face observations and interviews, I would have missed half of the conversation. In face-to-face interactions, entrepreneurs made constant references to their online interactions. The inverse also occurred, as many of their face-to-face interactions were augmented by online interactions such as blogging, tweeting, and posting pictures and videos on the internet about the face-to-face events and meet-ups they attended.

The two primary physical locations where I conducted fieldwork were Guadalajara and Mexico City, cities where the majority of startups in Mexico are located. I made short trips to Monterrey, also a large city with many startups, and two smaller cities, Villahermosa and Irapuato. I traveled to Silicon Valley on two occasions, meeting with members of the Mexican startup community who regularly travel there or who live there temporarily. I interviewed people from a number of cities I did not visit, including Mérida, Puebla, and Chihuahua. Conducting fieldwork and interviewing people from across the country allowed me to compare and contrast the innovation practices across different cities. It also allowed me to understand this community’s sense of identity as Mexicans, and how they build close relationships with people across the country, combining travel and online interactions. I also was able to observe the strong cooperation and coordination that exist between members of this national community to set up infrastructures and give greater visibility to the community outside Mexico.
4.4 Becoming a Participant Observer

To understand how technology innovation bootstrapping occurs, I had to go further than applying a multi-sited research strategy. I was compelled to participate in this transformation. As I entered into the field I realized that to study the transformation of the internet industry in Mexico, I must take an active role. I participated in the activities of the community in several capacities. I attended diverse face-to-face events such as hacking and coding sessions, talks, informal meetings, get-togethers, and outings. I regularly participated in the online conversation of the community, in Twitter, Facebook, and diverse specialized online spaces created by the startup community. What was more unusual for an ethnography was that I participated with a central role in the community, being a founding member of a hacker space, an organizer of diverse events, and assisting in the maintenance and growth of some online spaces.

Taking an active role in my fieldwork allowed me to elicit data that would have been difficult to obtain otherwise. I gained an intimate understanding of the motivations and aspirations of startup community members, and observed the initial transformations of the community’s practices and culture. I became conversant with many innovation practices, the nuances of building a personal network, and how to ask for advice and help. I was able to observe and understand in detail how to design social spaces that can facilitate interpersonal interactions and learning experiences. I participated in conversation about where the community should go in the future, how to expand it, and the impact in the larger context of the internet industry and Mexican society. I experienced the satisfactions, frustrations, and fatigue involved in organizing the community, and was able to give back something very concrete and meaningful. I became aware of the need to participate actively in the community early in my fieldwork. During the first month of my
research, I was invited to an informal meeting where several startup community leaders discussed how to create alternatives for funding of startups. Everyone introduced himself or herself by explaining how they could contribute to the advancement of the startup community. When my turn came, I presented myself as a researcher who could give them the perspective of an outsider to reflect about their community-building activities. The person who was leading the meeting pressed me for a more specific answer. I did not have one. A couple of weeks after this incident, I became involved in the creation of a hackerspace in Guadalajara. I was at an informal meet-up of programmers where a participant presented the idea of creating a hacker space to be a meeting point for everyone interested in creating technology and startups. An initial group of seven people became interested in the idea, including me, and started to meet regularly to create the space. Three months later, with a dozen initial members, we opened HackerGarage. Around that time, I also started participating as organizer of diverse community events in Guadalajara including informal meet-ups and more formal events such as Startup Weekends.

My personal background is very similar to many of those within the community, which allowed me to build a strong rapport. I am a middle-class Mexican male who graduated in Computer Systems Engineering from a Mexican college. I am similar in age to most members of the community. I also share a strong passion for technology and the desire to have a world-class innovation-based industry in Mexico. This closeness in backgrounds, interests, and aspirations, allowed me to develop friendships with members of the startup community. For instance, I developed a friendship with Santiago and César, developers, entrepreneurs and creators of a venture capital fund, and also active leaders of the startup community. Thanks to that friendship I became closely involved with the organization of Startup Weekend. I also became friends with the founding members of HackerGarage: Argel, Luis, Daniel, Irving, Ale, and Pablo. I have
developed many other relationships, and while these have not yet led to my participation in specific projects, I believe in the future they will. Personally, I feel fortunate to count these people among my friends. Methodologically, these close relationships allowed me to observe the development of specific members of the community over time.

Even if I developed a close relationship with the community, my position as researcher gave me sufficient distance from the community to balance my point of view. As I wrote the ethnography I analyzed the diverse points of view that I collected. My findings emerged from contrasting what I found in the literature with my own experiences, the observations I made, and the diverse points of view that the members of the community expressed in interviews and in their own writings. The developmental and comparative informatics perspectives informed my analysis to make sense of this multiplicity of voices, and render a rigorous and cohesive analysis.

4.5 *Researching Face-to-Face Events*

An important part of my study was to examine the role of face-to-face events in the transformation of innovation practices among the community. I selected the introduction of Startup Weekend events in Mexico, events where entrepreneurs collaborate to validate their ideas to create a startup over the course of a weekend (see Chapter 6), as a case study of how new innovation practices were adopted by the community. Yet, I also conducted fieldwork at other events to understand each kind of event in the overall learning process of the set of innovation practices at the individual and the community level.

I conducted a detailed and thorough field study of the introduction of Startup Weekend events in Mexico. I observed and participated in the initial organization of the events in this country. I participated in the Mexico City and Monterrey events as a regular attendee. I also worked as an
organizer of the events in Guadalajara on two occasions, during June 2011 and February 2012, to have a positive and concrete impact in the community and gain better access to the site. I interviewed selected people after the event.

In the other events where I conducted fieldwork I participated in different capacities, being an outside observer, regular participant, and organizer. I observed an event named iWeekend, which follows a dynamic similar to that of Startup Weekend: trying to build an entire product over a weekend. I participated in and organized several informal software development events, with a range of names such as “hackathons” and “SuperHappyDevHouse,” where developers create a technical project in a short time, even if it does not have a commercial application. I observed several entrepreneurship and technical formal conferences and informal meet-ups organized by the community, and I also took part in the organization of some of them.

In all cases I took extensive field notes during the event, and complemented my field notes with later analysis of photos and videos shot at the events. My field notes reflected the events’ dynamics, interaction among participants, and my own participation. I also detailed the kinds of technology and practices participants used, and the outcomes that the participants, organizers, and I myself perceived these events to have had.

For the Startup Weekend case, I conducted interviews with 15 participants from the Mexico City and Guadalajara events to explore their motivations, experience, and personal outcomes. I also interviewed six organizers from Mexico City, Monterrey, Puebla, Chihuahua, and Hermosillo to learn about their motivations and role. All the interviews in Mexico were conducted in Spanish. I conducted two additional interviews with members of the US Startup Weekend organization to gain insight on their perspective of the Mexico events, the Chief Operations Officer of that
organization and the Mexico City facilitator. These two interviews were conducted in English. All interviews were coded with a bottom-up approach, i.e., coding each interview with the themes found in it, finding the major themes across interviews, and categorizing those themes.

4.6 Researching Online Infrastructures of the Startup Community

To understand the role of online infrastructures in the Mexican startup community I followed during their entire lifespan the cases of two online spaces, a social news site named Noticias Hacker and newsletter called EarlyAdopters.mx. I conducted online observations, participated in the communities, and interviewed the participants. I wrote field notes detailing the discussions of the community, and my participation on the site. I analyzed the themes treated in the online spaces, the content of the discussions, the discourse, and the dynamics of the interactions. These two cases allowed me to analyze in depth how the startup community used online spaces to collaborate. I contextualized my online observations with the participants’ identities, as most revealed their names—I had met many of them personally during the various events of the community. Linking my online and face-to-face observations was important to assess the role of online infrastructures. I conducted the bulk of the fieldwork between February 2011 and September 2011, but continued with follow-up observations and interviews until July 2012.

I conducted a series of interviews with nine members of the Mexican startup community who participated in these two spaces. I asked about their work and learning practices, their information-seeking practices, and the technologies and online resources they used. I inquired about the specific role that the studied online spaces had in their learning. The community members I interviewed had a range of experience. Some were proficient programmers who aspired to become entrepreneurs. A few were more experienced entrepreneurs who had been
working on diverse startups for years. I also interviewed the creator of each online space on multiple occasions, first close to the launch of the space, and then follow-up interviews when the popularity of each project was dimming. In the interviews, I asked about the motivations to create these spaces, the work implied in their creation and management, and what outcomes the creator perceived these spaces brought for the startup community.

I collaborated in diverse forms to maintain these online spaces. I participated daily, reading content, submitting stories, and participating in discussion. I regularly invited people through my Twitter account, and sent invitation emails to diverse mailing lists. I had friendship relationship with its creator. Occasionally, I used these spaces to publicize some of the events I organized.

4.7 Conclusions and Methodological Contributions

My experiences in the field can be helpful to others conducting fieldwork in contemporary settings such as communities working on complex, high-stakes activities, interacting over multiple kinds of media, and geographically distributed. The main methodological contribution of my study is my realization that in order to study a transformational process—here the efforts of the startup community to transform the prevalent business culture in Mexico—it is necessary to participate deeply in those efforts. Only through this deep participation, over a period of time, is it possible to appreciate the development of these transformations. However, it is important to note that my participation in the field was not about prescribing how the community should conduct their transformation. In fact, nobody could prescribe in advance exactly what to do to conduct this transformation, given the great complexity involved in creating technology innovation in a country with little precedent for it. Rather, my participation was about learning, along all other members of the community, what we needed to do to bootstrap technology
innovation in Mexico.

To maintain scientific rigor I sought to synthesize data coming from a number of sources. The use of the developmental and comparative informatics frameworks, as theoretical and analytical tools, allowed me to not lose myself in this deluge of data. The comparative informatics gave me a method to anchor my data against what other researchers had found in different contexts, allowing me to render richer findings. The developmental perspective allowed me to synthesize the evolution of the innovation practices in the community, and relate this evolution to changes in Mexican society and as well as to the global transformations of work.
Chapter 5. The Role of Social Media in Making the Mexican Startup Community Visible Across Cultures and Contexts

5.1 Introduction

In this chapter I analyze the process by which Mexican internet entrepreneurs made visible—first to themselves, and then to people in Silicon Valley and to other Mexicans—their current innovation activities and the future desired state of a new innovation-based industry in Mexico. This visibilization process made use of the innovation infrastructures they had already built, and compelled them to create new innovation infrastructures. Using these infrastructures, entrepreneurs needed to combine visions and narratives with concrete actions and artifacts to make visible how they were transforming their industry. While social media facilitated the visibilization process, entrepreneurs engaged in complex semantic work to create concepts that allowed them to explain across cultures and contexts the transformation of their activities.

Within the discussion of CSCW, Engeström (1999) defined visibilization of work within an organization as the process to make visible the current state of work activities and a future work state people desired to achieve. Visibilization is the transformation of work by making visible how to overcome the current disturbances and contradictions (Engeström, 1999). Engeström explained that people arrive at the visibilization of transformations iteratively, engaging in concrete actions and building concrete concepts. Engeström studied visibilization by conducting an intervention in an organization to allow people to appreciate the transformations they needed in their activities for working more satisfactorily and efficiently. The research team facilitated the process, conducting diverse workshops and preparing artifacts, including videos and
diagrams depicting the organization’s activity, to prompt participants to reflect about their activity and determine what concrete actions they needed to take.

I respond here to Engeström’s research, presenting a contrasting case where a community took charge of its own visibilization process, empowered by new conceptual and technological resources, especially social media. I argue that the entrepreneurs’ strong motivation to innovate gave them clear direction to organize and marshal these new resources for transforming their industry. They leveraged powerful stories and practices from Silicon Valley to reflect about the current and desired state of their activities. They used a constellation of social media to maintain the conversation necessary for the visibilization process to happen.

Business needs prompted entrepreneurs to make their innovation activities visible for people in Silicon Valley and Mexico. They needed to be visible to gain access to crucial resources for building their startups. They sough to access venture capital, business connections, mentorship, and media coverage to gain users for their products. They wanted business people in Silicon Valley to partner with and invest in them. In Mexico they needed to become visible to government officials, academics, investors, developers, engineers, designers, managers, and other entrepreneurs who needed to participate in the transformation of the industry in Mexico. To engage with them, entrepreneurs sought to communicate their enthusiasm for creating an innovation-based industry.

Social media was fundamental to empower Mexican entrepreneurs for making visible the possibilities to transform their industry, and communicate that transformation across cultures. Yet, while it has been argued that social media has affordances to increase people’s visibility of their activities, behaviors, and knowledge at work (Treem & Leonardi, 2012), I found these
affordances were not readily available for entrepreneurs seeking to increase their visibility across cultures. Before starting their visibilization process, entrepreneurs needed to build common ground (Clark, 1996) with people outside their community.

However, creating common ground was not simply sharing knowledge, habits, and conventions. To establish common ground Mexican entrepreneurs needed to create a body of concepts that clearly transmitted the purpose and direction of their innovation activities. Together, this body of concepts allowed entrepreneurs to give sufficient background to other people to efficiently explain why, how, and with what tools they were transforming their innovation activities. Using this body of concepts they were able to explain their transformation and engage both people from Silicon Valley and Mexicans interested in technology. This body of concepts was comprised of visions that captured why they were doing these innovation activities and where they wanted to take the industry, narratives that explained how they were carrying out these innovation activities, and concrete concepts and artifacts that gave them the means to realize these visions and narratives in practice. In Table 1, I summarize the body of concepts used by entrepreneurs to create common ground for making their activities visible. This categorization of concepts and artifacts is inspired by Engeström’s (2006) categorization of resources necessary to conduct a collective activity. In my analysis I will refer to this categorization to analyze the concepts, actions, and artifacts that entrepreneurs had to create in order to make their work visible.

Table 1. Body of concepts used to create the necessary common ground for visibilization.

<table>
<thead>
<tr>
<th>Concept/artifact</th>
<th>Question being answered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision</td>
<td>In which direction will we transform our activity? Why are we transforming our activity?</td>
</tr>
<tr>
<td>Narratives</td>
<td>How will our actions serve to realize our vision?</td>
</tr>
<tr>
<td>Concrete actions and artifacts</td>
<td>What actions and artifacts do we need for realizing our vision?</td>
</tr>
</tbody>
</table>
Creating the concepts, actions, and artifacts to build common ground was very complex, requiring the community to both engage in complex semantic work, and complex practical actions. A reflection of this complexity was the arduous process the community underwent to start becoming visible in global social media. While Mexican entrepreneurs were proficient in using social media to learn innovation practices and connect with each other, for a long time they remained unknown in the global social media sites that would make them visible to people in Silicon Valley, and to the general public in Mexico. It was not until the end of my fieldwork that the community achieved major breakthroughs, gaining coverage by the most important internet industry global blog, and having their submissions appear in global social news sites.

I argue that the problems that entrepreneurs experienced to become visible were not due to technical shortcomings and lack of training. Rather, entrepreneurs experienced a conceptual gap between what was possible to achieve with the media, and how to purposefully use it to become visible. I will explain how as entrepreneurs achieved clarity in the body of concepts that formed their common ground, they increased their effectiveness in using social media to explain across cultures how they were transforming their identity, aspirations, and business culture.

5.1.1 Building Common Ground to Make Use of Social Media

Clark’s (1996) common ground concept allows me to analyze the semantic work that Mexican entrepreneurs were required to do before using social media to increase their visibility. Clark defined common ground as “the sum of the [participants’] mutual, common, or joint knowledge, beliefs, and suppositions” that makes possible effective interpersonal communication. Common ground is not an affordance of a technology or medium, but a communicative achievement of people that is supported by technology or media (Birnholtz, Finholt, Ave, Arbor, & Horn, 2005;
Nardi, 2005). Common ground is relational to the people involved in the act of communicating (Clark, 1996); that is, creating common ground depends on the people who are communicating.

People can use social media applications to greatly increase their ability to communicate, improving their capacity to socialize, share knowledge, make contributions visible, cross organizational boundaries, and participate at a higher capacity in their organizations and societies (Archambault & Grudin, 2012; Dimicco et al., 2008; Skeels & Grudin, 2009; Treem & Leonardi, 2012; Zhang, Qu, Cody, & Wu, 2010). Social media allows people in isolated locations to learn about the culture and practices of communities, providing them with a sense of connection to a larger community (Goggins & Mascaro, 2012; Gruzd, Wellman, & Takhteyev, 2011).

Building the context for using technology for increasing people’s communication capacity is a product of people’s efforts, and not a feature of technology (Orlikowski, 1992). When people are located within the same culture, the effort to establish a shared context is minimal because they share conventions that enable them to easily create a context for effective communication.

But when people communicate across cultures and contexts, they first need to develop a set of shared understandings, i.e., common ground (Clark, 1996; Cramton & Hinds, 2005; Nardi, 2005; G. Olson & Olson, 2000; Setlock & Fussell, 2010). Building shared understandings is not trivial. People must figure out what elements are held in common, repurposing those elements to create new meanings for grounding communication. To communicate their efforts to transform their industry, entrepreneurs used elements they had in common with people outside their community.

Treem and Leonardi (2012) proposed a definition of social media in terms of four critical affordances it provides for people to communicate within the organizational context: it allows
people to increase the visibility of their behaviors, activities, and knowledge; it can be used to enable the persistence of people’s conversations and communications; it allows people to edit and revise their creations; and to make evident the associations between people and pieces of information. To craft their definition, the authors focused on how people used the features of social media applications to post, comment, update their status, vote, friend, edit each others’ content, and share pictures and videos. Treem and Leonardi’s analysis included studies of blogs, microblogs, social networking sites, wikis, picture and video sharing sites, and social news sites.

Treem and Leonardi’s (2012) definition is useful to analyze how people build the context to communicate using social media. These authors argued that previous definitions of social media were based on the features of technology, and did not clarify “the ways the technology becomes mutually constituted with the organizational context in which it is embedded.” They used the concept of affordance in the original sense proposed by Gibson (1986), as the kinds of uses that an object affords people. They explained that “affordances are not exclusively properties of people or of artifacts—they are constituted in relationships between people and the materiality of the things with which they come in contact.” Technology affordances emerge when people take advantage of the technology’s features within a specific context (Orlikowski, 1992).

The affordance of visibility of social media, for Treem and Leonardi (2012), is the ability it gives people “to make their behaviors, knowledge, preferences, and communication network connections that were once invisible (or at least very hard to see) visible to others in the organization.” For them this notion of visibility “is tied to the amount of effort people must expend to locate information. […] If social media technologies enable people to easily and
effortlessly see information about someone else, we say that the technology was used to make that person’s knowledge visible.”

For Treem and Leonardi social media makes it easy for people to communicate their activities. This is true, for instance, inside an organization where it is possible to make intelligible a short microblogging message such as “The client approved our proposal!” That message would make visible to many within the company the achievement of those involved in preparing the proposal, as most members would have shared knowledge and beliefs about the company, the client, and the importance of the proposal. Within an organizational context people have existing common ground ensuring effective communication.

However, I found that within the context of intercultural communication, the work that people must do to use social media to make their activities visible might not be trivial. People must first create common ground, which depending on the context, might require substantial effort. For Mexican entrepreneurs, engaged in a high-stakes activity, creating common ground was complex. Misinterpretations would get in the way of people outside their community joining them in their efforts to transform the industry.

5.1.2 Common Ground in a High-Stakes Activity

In high-stakes activities, common ground is built by creating shared visions and narratives of the outcomes that people want to achieve (Bødker & Andersen, 2005; Clark, 1996; Engeström, 1999, 2007). These concepts help people in high-stakes activities to collaborate efficiently and coordinate their efforts, even if there is a high degree of uncertainty on what specific actions to carry out. Mexican entrepreneurs were strongly committed to build their companies and
transform their industry. They created visions and narratives that transmitted their sense of commitment and urgency, and the great economic and social opportunities that would come with this transformation. These visions and narratives allowed new participants to engage in creating new actions, such as building a new event or a new platform, even if there were no specific directions that ordered them to do so.

Engeström (1999) explained that visibilization “is not a straightforward process that can be neatly controlled from above.” While his research team created an intervention to facilitate the process, it was the participants who needed to generate the new concepts to transform their activities. The intervention of the researchers allowed participants to make visible the contradictions in their current activity. Yet, this knowledge alone was too abstract. Participants needed to form a vision of their transformed activity, and understand what concrete actions would yield this transformation. This process was iterative. As people created the initial concrete actions and concepts, it became increasingly clearer how to make those changes more permanent, and they refined their vision of what it meant to transform their activity.

To facilitate the entire visibilization process, going from the abstract concepts to the concrete actions, Engeström’s organizational intervention used the “Change Laboratory” (Engeström, Virkkunen, Helle, Pihlaja, & Poikela, 1996) methodology, providing a physical space in the workplace for participants to meet regularly to analyze and redesign their work activity, building visions that captured the complexity of their activities, and concrete actions to achieve the transformations they were seeking.

The visibilization process requires strong personal involvement from the participants. Engeström (1999) explained how participants entered into a profound dialogue, pointing at painful
contradictions of their current activity, and started developing new solutions that often implied changing pernicious old habits. I observed similar patterns among Mexican entrepreneurs. They urgently needed people outside of their community to become part of this transformation. If they failed to attract the attention of people in Silicon Valley and other Mexicans, the new industry might never materialize. The activity in which they were engaged was utterly complex: they needed to transform deeply ingrained habits of the Mexican business culture that were not conducive for technology innovation. They had very limited resources to generate the startup culture, since most of them were already under personal and financial strain trying to create their own startups.

5.2 Findings: Visions, Narratives, and Concrete Actions and Artifacts to Build the New Mexican Internet Industry

Mexican entrepreneurs realized that their vision of a new industry had to counter deeply rooted perceptions in the larger Mexican business culture, that made many Mexicans believe it was impossible to create world-class innovations in their country. These perceptions were rooted in the outdated methodologies and technologies used by most Mexican companies, and its mistrustful and uncooperative business environment. To debunk those perceptions the startup community built a vision where their new industry used the latest global technologies and innovation practices, and had a strong culture of collaboration and cooperation. With this vision, entrepreneurs sought to persuade an entire generation of Mexicans interested in technology to join them in building a new internet industry. Those who built this industry would be proud of their work, transforming their country. Entrepreneurs’ narratives explained how, unlike most Mexican companies, they were committed to building companies based in technology
innovation, creating products to be used globally. They were committed to giving the best use value to the user, unlike the few internet products created by older Mexican internet companies that did not belong to this community and that delivered substandard value. This community was creating attractive and useful products using the newest technologies.

Mexican entrepreneurs relied heavily on cultural elements from Silicon Valley to build their vision of a new industry. There was little precedent for how to create technology innovation in Mexico. Entrepreneurs needed to conceive from scratch what it meant to create a startup in Mexico and what it implied to create a new industry. Without role models in Mexico that they could emulate, the stories from Silicon Valley allowed them to overcome this lack of precedent, allowing them to reflect on the necessary features for creating a startup culture.

At the same time using elements from Silicon Valley culture allowed them to build a narrative that was useful to enlist the support of Silicon Valley investors and business partners. To build strong companies and take advantage of the huge market potential in Mexico, entrepreneurs used the same methodologies, techniques, and technologies as entrepreneurs in Silicon Valley used. They had the same commitment to creating products that changed how the market worked, and that delivered the highest value to the user. They were as passionate as anyone in Silicon Valley about technology innovation. And just as entrepreneurs in Silicon Valley had done, they had created a series of applications, initiatives, and events to support each other in learning how to create startups using practices similar to those used by their American counterparts.

Transforming those visions and narratives into practical actions required a great deal of effort. Doing the work to get from the abstract visions and narratives to concrete actions and concepts, was what allowed the community to create a visibilization process that had a strong potential to
transform innovation activities in Mexico. Entrepreneurs implemented in their companies Silicon Valley methodologies and techniques, such as lean startup and agile software development methodologies, to bolster their innovation process. They learned that less hierarchical organizations allowed more efficient innovation work. They learned about the tastes and characteristics of other markets, especially the US market, and contrasted them against the Mexican market. To support each other in this learning and appropriation process, they created multiple technical and entrepreneurship groups to discuss how to create technology innovation in their context. Those groups interacted both online and face-to-face. Many were informal and ad-hoc, while other groups were more formal and met regularly.

The startup community discussed how to implement this vision across diverse media. In those discussions, across many years, they formed a solid narrative for grounding their communication outside their community. To ground their communication with hesitant Mexican investors, government and university officials, and potential employees, the startup community appealed in their narrative to the great capacity that they believed Mexicans had to create technology. The narrative vindicated Mexican developers, engineers, designers, and entrepreneurs as having talent and passion comparable to anyone in Silicon Valley. The narrative explained that the products created by Mexican startups and the initiatives of the community were world class. For instance, when a major Mexican newspaper interviewed César and Santiago, founders of the first early-stage venture capital fund for Mexican startups, they explained they invested in Mexican companies because they “believed in the Mexican talent” to build high-growth companies. Their firm was in it for the long run, “not only concerned with [immediate] economic returns,” as they believed it was more profitable and rewarding to invest in the transformation of the industry.
In this section I analyze how they worked out their personal aspirations to innovate and translated those visions into actions to start becoming the entrepreneurs they wanted to be. I examine how the startup community experimented and built with diverse specialized social media sites to connect the startup community, enabling the dialog necessary for visibilization. I unpack how they worked out across diverse kinds of media the concrete artifacts that were used to communicate the visions and narratives for their startup community. I capture and analyze their reflections on their collective actions, for creating new concepts to transform their activity in the long term, such as working out concepts to organize for getting greater visibility in global blogs and social news sites.

5.2.1 “Social Media Makes Me Think as If I Were in Silicon Valley”

Many Mexican entrepreneurs described global social media as “eye openers” to understand their own capacity to create innovative products and companies. Even if there were no local role models of technology innovators, reading the stories of entrepreneurs in global social media allowed them to become motivated by the great economic and professional potential of creating startups. These stories allowed entrepreneurs to overcome the discouragement they received from people within their local context who considered creating internet products too risky and difficult. Over time, entrepreneurs developed a strong sense of closeness with the culture of Silicon Valley by continuously reading stories in global social media.

Most of the early members of this community discovered technology entrepreneurship thanks to global social media. They actively advised other Mexicans to read global blogs and social news sites such as TechCrunch, Stack Overflow, and Hacker News. They hoped that the more
Mexicans who read these sites, the more people there would be who had absorbed the values, knowledge, and practices of Silicon Valley, making it easier to build a new business culture.

The case of Enrique, a developer in Mexico City who was eager to create his own startup, is representative of how Mexicans learned about technology entrepreneurship using social media. Although his parents and teachers advised Enrique to find a stable engineering position at a large multinational company after college, he transformed his aspirations after reading sites such as TechCrunch and Hacker News. He wanted to create global internet products, learn innovation practices to create a Silicon Valley-style startup, and gain motivation to become a technology innovator. His inspirations were reinforced as he participated in the technology and entrepreneurship events of the startup community in Mexico City such as the SuperHappyDevHouse and Startup Weekends.

Enrique became strongly identified with Silicon Valley entrepreneurs in their passion to create technology. He became aware of how he could use his developer skills to create great internet products, just as Silicon Valley developers built innovative companies armed with their technical skills, talent, persistence, and passion. In Silicon Valley, entrepreneurs gained access to resources based on their merits, not just through who they knew. This was a deep realization for Enrique, as in Mexico it is often perceived that top businesspeople must come from privileged families with strong political connections. As a middle-class person, Enrique felt closer to Silicon Valley entrepreneurs than to these Mexican businesspeople.

Enrique explained that social media made him “think about things as if I were in Silicon Valley,” absorbing its values, visions, practices, and ways of thinking. For instance, Enrique learned about the potential of Android to become a major mobile platform while reading TechCrunch and
Hacker News. When he had this realization in early 2009, he became motivated to be a proficient Android developer, at a time where there were few developers in Mexico or indeed in the world who had mastered the platform. He devoured technical documentation, blogs, and online books, and did freelance Android development for clients in the US and Mexico. To get those jobs he leveraged the connections he had made in the Mexican startup community events. Enrique founded the first technical group in Mexico devoted to Android, and worked in open source projects to increase his knowledge. This built for him a strong visibility as a top Android developer. At the time of writing Enrique had not yet founded his own startup. However, he was experimenting with several product prototypes, and networking to find potential co-founders.

5.2.2 Combining Social Media and Face-to-Face to Amplify Community Visibility

Mexican entrepreneurs skillfully combined face-to-face and online interactions to strengthen the relationships that constituted the startup community. Social media allowed them to find other Mexicans who shared their interests in technology innovation. During the formative period of the community, roughly between 2007 and 2009, there was no visible community at all. During that time, Twitter and blogs allowed the isolated Mexicans interested in technology entrepreneurship to find each other. During that period a significant portion of Mexican Twitter users were internet entrepreneurs, as Twitter was mainly populated by early adopters. Many members of the startup community started to meet on Twitter. As more people conversed about technology entrepreneurship, it became increasingly easier for other Mexicans to find them.

Face-to-face events helped them to solidify these relationships, building trust and camaraderie. Technical and entrepreneurship groups that interacted on social media started to meet regularly in coffee shops. When they built stronger relationships, some created hackerspaces that became
regular meeting points, and organized formal events with from several dozen to hundreds of participants. One of the events widely seen as pivotal for the startup community was a conference named “Mexico Web 2.0” in late 2008, when many entrepreneurs who had previously interacted online met in person for the first time.

The startup community amplified the visibility of its events using social media. Organizers invited people beyond their networks using Twitter and Facebook, asking their friends and followers to re-tweet and share the announcements. Event participants tweeted, blogged, shared pictures, and even streamed live video about their experiences. The media produced at these events allowed those who did not attend to be aware of the community’s activities.

Entrepreneurs experienced online and face-to-face interactions as part of the same reality, similar to what Taktayev (2012) reported for Brazilian developers. To create continuity between their online and in-person interactions, when using social media entrepreneurs disclosed their real names and tried to use the same username across multiple applications. Entrepreneurs often merged their online and offline identities; many liked to use their online user name as a nickname in face-to-face interactions. In some events such as the SuperHappyDevHouse, people would wear nametags with their Twitter handle, instead of their real name. Entrepreneurs in Silicon Valley and elsewhere often follow similar practices.

5.2.3 Setting Direction and Defining Purposes for Social Media Applications in the Mexican Startup Community

While generous and good hearted, many of the early efforts of the entrepreneurs to support their community suffered from being uncoordinated and lacked impact. The community needed to
create concepts that allowed its members to work collectively with a sense of common direction and purpose. The two cases I present next of new social media applications for the community, Noticias Hacker and EarlyAdopters.mx, exemplify the arduous semantic work of crystallizing multiple perspectives into concrete actions. Entrepreneurs progressively learned to build applications and initiatives that were effective to support entrepreneurs in creating more successful companies. The greatest challenge was not technical, but rather how to effectively communicate the benefits of using these applications. Entrepreneurs needed to engage in many unsuccessful efforts, to learn how to communicate their purposes with clarity, making the new applications actually facilitate innovation work.

Mexican entrepreneurs built specialized social media for their community, as global social media was not sufficient to support them in turning their visions of a new industry into reality. Global blogs, forums, and social news sites were not the appropriate venues for detailed discussions about technology and startups in Mexico. For instance, while there were many important legal, economic, and organizational peculiarities in creating a company in Mexico, the general Hacker News audience would not be interested in discussing the specifics of companies in that country. TechCrunch had no interest in covering most technology and entrepreneurship events in Mexico. These social media sites had no affordances to allow people to group by nationality. They did not allow the startup community to become more visible among other Mexicans.

Mexican entrepreneurs experimented with blogs, forums, social news sites, and newsletters to increase their visibility among Mexicans, and create inclusive environments where entrepreneurs of all levels of experience could share information and knowledge. While many of these applications had an initial enthusiastic uptake, they faded away after a few months. The founders
of the sites needed to maintain the engagement of participants, sending personalized reminders via email, Twitter, and Facebook for people to continue participating in the site. The reliance on their creators to sustain participation made these applications weak in the long term.

To avoid the decline of their applications, the creators needed to engage the members of the community to take ownership, making fully clear the purpose of participating in these sites. Jorge, a Mexican venture capitalist and an active member of the startup community, explained in Twitter why he believed many efforts of the startup community failed to become viable:

> The problem is not the lack of [online] applications, initiatives, and events. The problem is that there is no clear direction, and no explicit purpose for them.

For Jorge, the problem in enabling innovation in Mexico did not lie in the lack of efforts. The problem was at a deeper, semantic level. *There was a disconnect between the potential of the social media applications, events, and other initiatives to facilitate innovation, and the actual understanding of how the community was using these resources.* Only when the community communicated with clarity the purpose and direction of their efforts, would they in fact enable innovation activities. The creators of these efforts needed to bridge that disconnect.

Jorge’s tweet was part of the ongoing conversation reflecting how new applications, initiatives, and events strengthened the startup community. His comment was not bitter, but self-critical, as a user of the startup community’s applications and as an organizer of a number of entrepreneurship events. Many other members were also self-critical in a healthy dose.
5.2.3.1 Noticias Hacker, Like Hacker News But in Spanish

Noticias Hacker was a social news site created by Santiago to allow Spanish-speaking internet entrepreneurs and developers to discuss technology innovation and startups in Latin America. Santiago thought that a social news site modeled after Hacker News would be a timely information sharing channel within the regional industry. Hacker News did not cover many Latin American topics. After its launch in March 2011, Noticias Hacker enjoyed strong activity for five months, averaging two hundred daily unique visitors. Entrepreneurs shared information about Latin American startups, technology platforms, market trends, funding opportunities, and entrepreneurship events. For some entrepreneurs the site was very useful for critiquing each others’ products, sharing business experiences, and expanding their network of contacts.

In an interview Santiago reflected that Noticias Hacker was “a remix, like everything in this world.” Noticias Hacker was strongly inspired by Hacker News: its user interface and community guidelines were very similar, and even its name was a direct translation of Hacker News into Spanish. Yet, Noticias Hacker took elements from Reddit.com, another leading global social news site. When Santiago opened the code of Noticias Hacker, members developed Reddit.com-style user notifications and search box, to improve the usefulness of the site.

Use of Noticias Hacker faded around August 2011, when the founder was no longer able to spend time encouraging the discussion. Santiago constantly reminded members of the importance of participating. But when he became overloaded with work commitments, no other member stepped up to animate the discussion. Without encouragement and reminders key members quickly stopped contributing with news links and comments, and the site lost traction. The community around Noticias Hacker was not able to form a lasting habit of participation, as
they did not have clarity on the benefits of participating. Santiago needed to remind them about the need and benefits of participating, in personalized messages. The amount of time needed to get the community to perceive the value of the application and develop the habit of participating was more than Santiago was able to devote to cultivating the habit within the community. At the point when Santiago stopped maintaining the application, the community was not large enough and its participation rate was not high enough for the application to continue to be interesting.

Santiago reflected in an interview that one of the reasons it took so long to build a core community for Noticias Hacker, was that the community it aimed to serve had an overly broad membership, with entrepreneurs from all of Latin America. There was no identity as a Latin American startup community, as there was for the Mexican startup community. Many of the members did not have contact in other social media besides the social news site. Without a shared context and identity, it was difficult to establish common interests and expectations. This lack of cohesiveness made it impossible for the Noticias Hacker members to encourage each other to participate after Santiago left.

5.2.3.2 EarlyAdopters.mx, a Newsletter to Make the Newest Startups Visible

EarlyAdopters.mx was a weekly email newsletter that Santiago started in September 2011 building on the learning he obtained from the experiences of Noticias Hacker. This newsletter had paragraph-length reviews of three to five Mexican startups, with the URLs, email, Twitter, and Facebook addresses of the startups. While the newsletter was delivered to the mailboxes of its readers and did not enable commenting on applications within the format of the newsletter itself, it prompted the readers to send their feedback on the applications directly to the startups, using social media. Santiago sought to design an application with a very specific purpose:
helping new entrepreneurs and startups to get the first users for their products. He wanted a clear objective, which in his view had been the main problem for communicating the value of Noticias Hacker. The newsletter became popular and sustainable in the long run. At the time of writing this dissertation, the newsletter was still active with a readership of over thirteen hundred people from all over Mexico, more than twice the number of registered users for Noticias Hacker.

Santiago targeted EarlyAdopters.mx to a more specific public than Noticias Hacker, hoping the focus would facilitate generating a core readership. He went after Mexicans interested in technology, clearly branding the site as Mexican: the top domain of the application was dot mx, and its logo was a variation of the “Made in Mexico” symbol. Mexicans immediately recognized these symbols, inciting their curiosity to learn about technology created in Mexico. Maintaining the newsletter was much easier for Santiago than Noticias Hacker had been. The newsletter was delivered directly into the mailboxes of subscribers, eliminating the need to remind people to come back to the site, and creating a sustained engagement. According to the analytics of the newsletter, more than half of the subscribers opened the email. Santiago needed to devote less than three hours a week to the newsletter, in contrast with the twenty hours a week that Noticias Hacker had required. Also other entrepreneurs started volunteering as invited editors. This combination of factors made it practical to maintain the newsletter for a prolonged period. Santiago was able to give a clear value to the community with a reasonable amount of work.

5.2.4 The Work Behind Global Visibility

In the last months of my fieldwork I observed how the Mexican startup community was starting to become visible in global social media outlets: they achieved their first submission on the front page of Hacker News, and got the first series of posts on TechCrunch featuring Mexico as a
country with a healthy technology entrepreneurship community. In this subsection I will analyze the work that the community did to achieve these important landmarks. Mexican entrepreneurs prepared for years to become visible building their startups, convincing investors to invest in them, and organizing events across the nation. Those years of hard work allowed them to create a capacity to organize and act together, and to communicate effectively how they were implementing their vision of a new Mexican internet industry.

Entrepreneurs continuously discussed how to become globally visible, and what kind of narratives and actions would catch Silicon Valley’s attention. A discussion thread in Noticias Hacker, during the early days of the site, is representative of the efforts for understanding their visibility process. The entrepreneur who initiated the thread argued he did not want Noticias Hacker be an excuse for the community to not participate in Hacker News. The discussants acknowledged that Noticias Hacker was not a substitute for participating in global social media. Then they reflected that to break into global social media they needed to build a “circle of influence,” friends who would up-vote their submissions to start getting attention. Others pointed out that many entrepreneurs lacked the “level of ambition” and technical sophistication to be interesting for Silicon Valley entrepreneurs and investors. César, who was among the discussants who made that point, was able to attract the attention of Silicon Valley thanks to his ambitious mindset and a cutting-edge set of technical skills. He built a startup with US mentors, and then built an early-stage venture capital fund with Silicon Valley investors. Yet, César and the other entrepreneurs were cognizant that the transformation of their fellow Mexican entrepreneurs would not happen overnight. The community needed to create a suitable environment where
people were exposed to others with ambitions to transform the industry, cultivating a practice of continuously learning the latest trends to efficiently create products and startups.

### 5.2.4.1 Getting on the Front Page of Hacker News

The first submission of the Mexican startup community to get on the Hacker News front page was a link to Noticias Hacker. The Latin American social news site caused a strong interest and a heated discussion among the Hacker News community. To get their submission on the front page amongst the dozens who competed every few minutes for that spot, the Mexican startup community worked as their own “circle of influence,” up-voting for the submission.

A week after Santiago launched Noticias Hacker he asked his friends on Twitter to spread the word about this new application. I retweeted Santiago’s tweet, asking my followers to spread the word. One of them, Armando who was among the few Mexicans who regularly posted on Hacker News, submitted the link to that American social news site. Armando titled his submission was titled “Noticias Hacker, like Hacker News but in Spanish.” Armando tweeted back the link of his submission, and around ten members of the community, including Santiago and myself, rushed to up-vote it. We encouraged our Twitter followers to up-vote and comment on the submission. The submission remained on the front page for about six hours and got eighty comments from people all over the world. During this time more than twenty thousand visitors coming from Hacker News visited Noticias Hacker.

This achievement made the Mexican startup community realize that they had the capacity to attract the attention of a global community. Within the next couple of months two other submissions from members of the startup community, a blog post and a new open source
application, made it to the front page. César reflected in an interview, “it is not so difficult to get on the front page of Hacker News. It requires you to convince ten people to give you ten seconds of their time [to vote for your submission]. Once you are on the front page, you are on your own, you are competing in global terrain.” That learning made others within the community realize that if they were able to organize their own resources and local contacts, they could increasingly become more visible on global social media.

### 5.2.4.2 Competing on Global Terrain: “Mexico Is Happening at TechCrunch Disrupt”

Between August and September 2012, a series of articles covered Mexico’s internet industry for the first time on the TechCrunch blog. The blog first published a couple of posts about recent acquisitions and investments made by Mexican venture capital funds. A few weeks later they posted an article named “Mexico Is Happening at TechCrunch Disrupt,” portraying Mexico as a country with a vibrant internet industry, poised to become an important technology center. These posts signaled that Mexican startups were now competing on global terrain, gaining the attention of a major social media outlet, attention that anyone involved in startups was eager to have.

The post “Mexico Is Happening at TechCrunch Disrupt” was written collaboratively by three entrepreneurs: Eduardo and Rocío, Mexicans, and Eion, American. They worked to get a spot for the Mexican startup community to present at the San Francisco TechCrunch Disrupt conference, a major venue for technology startups. The TechCrunch editors asked the trio to write a post to prime people for the presence of a Mexican startup pavilion at the conference.

However, to gain the initial attention of the TechCrunch editors, the trio leveraged the support of large numbers of Mexican entrepreneurs to gain visibility. The organizers of TechCrunch
Disrupt did not originally consider Mexican startups for their conference, as they were completely unfamiliar with that community. They had invited Brazilian and Israeli startups, in addition to countless American and European startups, as they knew those communities well. When TechCrunch put an open call for Brazilian and Israeli startups on the blog, Eoin, an avid reader of the global blog and close to the Mexican startup community, commented that they should open a space for Mexican startups. Immediately thereafter, Eoin messaged his Mexican entrepreneur friends, asking them to do something to get Mexican startups into TechCrunch Disrupt. Several entrepreneurs got very excited about the idea of a pavilion, Rocio and Eduardo included. They were well connected in the Mexican startup community. They asked all the Mexican entrepreneurs to “flood” the organizers of TechCrunch Disrupt with emails and tweets requesting the creation of a Mexican pavilion. After hundreds of emails and tweets sent by Mexican entrepreneurs the event organizers met with Eoin and Eduardo in San Francisco. They negotiated a Mexican pavilion for twenty startups. When the deal was closed, Eduardo and Rocio contacted suitable Mexican startups, and thanks to their good connections they quickly convinced twenty ambitious and sophisticated Mexican startups to participate in the conference.

The trio wrote a post that grabbed the attention of the global blog readers, presenting Mexico as a country with great potential and with an industry that was ready to achieve global status. They explained the country had great market potential, but was still underdeveloped. They asserted that their community had vibrant innovation activity and was hungry to become part of the global landscape of innovation. They highlighted how the countless community events were putting “technology entrepreneurship at the center stage” for university students who were potential entrepreneurs. They explained how institutions including universities, government
entities, and investors were working to back up a more innovative industry with education and money.

To build common ground with the global readership, they presented how the Mexican startup community was building its industry using the business culture and practices of Silicon Valley. The narrative was convincing because it described their concrete actions, with a clear objective. For instance, the post explained how the community had organized “countless events […] including Women’s 2.0 Founders’ Friday, Startup Bus, Startup World (powered by The Next Web) and Lean Startup Machine.” All of these events were also organized in Silicon Valley.

The narrative explained how Mexican entrepreneurs collaborated over time to achieve the merit required to become part of the global landscape of innovation, as the following quote reflects:

> All in all, the growth and opportunity in the Mexican startup scene has slowly become visible in more events and more parts of the world. With Mexicans consistently demanding inclusion on the basis of talent and competing skills. This is how the pavilion at TechCrunch Disrupt came to happen. When, with little over a week’s notice startups were given the green light to plan trips and register, eager entrepreneurs took the challenge by storm and will be presenting their companies at this year’s event.

The trio argued that their community’s consistent work allowed them to “demand inclusion” from the global community of technology innovators. Community members demonstrated they could become a world-class industry, by coordinating individual efforts with those of the community, and using clear, tangible actions—such as meeting the “challenge” to gain presence at the TechCrunch Disrupt event—to achieve that coordination.
5.3 Discussion: Bootstrapping Visibilization Across Cultures

The Mexican startup community’s visibilization processes presented great communication challenges. Engeström's (1999) case of visibility occurred within a single organization where people shared common ground and worked in the same place. But the Mexican entrepreneurs needed to build common ground across cultures. They lacked a strong organization and solid identity, and were geographically scattered across the country.

To overcome these challenges, the entrepreneurs worked at a semantic level and a practical level to make their activities visible. Practical actions alone would have been unintelligible to people outside their community, and new concepts alone would not be useful if they were not communicated with practical actions.

In Table 2 I summarize the concepts, and concrete artifacts and actions the community conducted to create common ground, building on the categorization presented in the introduction of this chapter. Entrepreneurs’ shared aspirations kick-started the visibilization process to transform their activity. Shared aspirations enabled them to create a cohesive vision for transforming their industry. They progressively developed a stronger organizational capacity for carrying on the concrete actions necessary to become visible, even with few external resources. The vision was formed as they talked about individual and collective aspirations to innovate, pushing each other to become better entrepreneurs and to adopt new innovation practices in their startups and the community of entrepreneurs. Progressively, they aligned concrete actions with the needs of their companies to obtain crucial resources to grow.
Table 2. Body of concepts, artifacts, and actions built by the Mexican startup community to make their innovation activities visible.

<table>
<thead>
<tr>
<th>Concept/Artifact</th>
<th>Question being answered</th>
<th>Meaning in Mexican startup community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision</td>
<td>In which direction will we transform our activity? Why are we transforming our activity?</td>
<td>Entrepreneurs wanted to create an innovation-based internet industry. This vision built on their shared aspirations.</td>
</tr>
<tr>
<td>Narratives</td>
<td>How will our actions serve to realize our vision?</td>
<td>Build Silicon Valley-style startups in Mexico, even if that means going against the local business culture.</td>
</tr>
<tr>
<td>Concrete actions and artifacts</td>
<td>What actions and artifacts do we need for realizing our vision?</td>
<td>Building innovation infrastructures for the community (e.g., new social media spaces, events). Implement new innovation practices in the companies, community. Create concrete concepts such as the “circle of influence.”</td>
</tr>
</tbody>
</table>

Yet, common aspirations alone would not have not led to the formation of a coherent, shared vision. Entrepreneurs needed practical means to work together to enable the transformations. In contrast to Engeström’s case, the Mexican entrepreneurs did not have a research team that supported them in the visibilization process. Engeström’s team organized intervention meetings in a physical space, while the entrepreneurs used a various kinds of social media to facilitate conversations, build the narrative, carry out practical actions, and construct the concrete artifacts they needed to make their activity visible. Instead of the videos and diagrams used by Engeström’s team to prompt reflections, entrepreneurs used Silicon Valley stories to reflect on how to transform their own environment.

The vivid stories from Silicon Valley gave the entrepreneurs sufficient detail to develop a narrative of how they would realize their vision, creating Silicon Valley-style startups in a country with little precedent for innovation. This narrative embraced the culture and practices of Silicon Valley, sparking the enthusiasm of many interested in technology. The narrative allowed
the community to tell the story of how they were transforming their internet industry to people outside their community, explaining how their companies had adopted new innovation practices and rejected the traits of the local business culture that impeded innovation.

Following the logic of their narrative to create Silicon Valley-style startups, the entrepreneurs analyzed which concrete concepts and actions they needed to realize the transformation of their activity. For instance, when they noticed how Silicon Valley people became visible on Hacker News, they realized they needed to develop a “circle of influence” that would vote for their posts on that site.

As the visions, narratives, and concrete concepts converged into a cohesive conceptual body, entrepreneurs build further on these resources. For instance, when they wanted to gain the attention of TechCrunch editors, they became their own circle of influence. To make their case more interesting to the audience of the global blog, they told their story using the narrative of how they were building Silicon Valley-style startups in Mexico, even if this country had little precedent for technology innovation.

5.3.1 The Semantic Challenges of Creating Concepts for Visibilization

The greatest difficulty in the semantic work was building concepts that travelled across the incompatible Mexican and Silicon Valley business cultures. Entrepreneurs solved this problem by making visible the challenges and opportunities of innovating in Mexico. They worked to articulate what aspects in the Mexican business culture needed to change, as well as the potential of the Mexican people and market. Their narrative inspired people from varied backgrounds to work for transformation. And crucially, it made them feel empowered to effect change.
Entrepreneurs’ communicative achievement lay in explaining that as more people joined them, they were more likely to transform Mexico’s industry. Semantically, the community needed to reflect deeply on their strengths and on the challenges of becoming part of global networks of innovation. At a practical level their work for global visibility concerned coordinating actions to gain the attention of global social media, as when they made the front page of Hacker News and TechCrunch.

Entrepreneurs were cognizant that creating concepts for a new business culture was a long-term commitment. They needed to maintain an explicit conversation, with a critical and constructive perspective, to revise their concrete efforts and the pertinence of their concepts. An example of this conversation was Jorge’s tweet commenting on the lack of purpose and direction he saw in some efforts of the community. Without this reflective conversation it would have not been possible to move forward the new conceptual set they needed for building a new industry. The challenge that lies ahead for the community is to maintain this reflective conversation, to keep relevant their concepts and practical actions in the changing landscape of global innovation. While social media can facilitate this conversation, the key is to encourage the community’s reflection about emergent contradictions and challenges, with appropriate rules and dynamics.

5.3.2 Social Media Has Transformed the Visibilization of Innovation Work

In the past, the people who migrated back from global centers of innovation to middle-income countries were the only means to transform innovation activities and connect to global networks of innovation (Saxenian, 2006; Tuomi, 2006). Yet, the Mexican startup community shows a departure from that pattern, with an historically new way of making visible the possibilities of an innovation-based industry.
The personal processes of entrepreneurs appreciating their possibilities to become world-class innovators were situated within a larger community process, of making visible the new industry. Social media made these processes possible in a dual fashion. First, global social media brought the initial stimulus that opened up new possibilities for entrepreneurs to transform their activities. Similarly other researchers have found how the flows of information carried by social media, full of mundane details, allow people to develop a strong cultural proximity even at a distance (Goggins & Mascaro, 2012; Gruzd et al., 2011). Second, social media made it materially possible for the community members to expand their connections with other Mexicans with the same aspirations. Without social media the community would have not expanded its membership to be sufficiently large and committed, pushing each other for their industry’s transformation.

Similar processes to that of the Mexican startup community seem to be taking place in other middle-income countries, suggesting that social media has fundamentally transformed how people learn to innovate. While not having done extensive fieldwork, I have observed discussions in social news sites focused on the Indian (www.hackerstreet.in) and the South-African, Kenyan, and Nigerian startup communities (www.afritech.org). In both sites participants seem to follow similar patterns to those I found in Mexico: entrepreneurs explain that they draw inspiration from stories of Silicon Valley, while specialized sites allow them to discuss how to use Silicon Valley’s knowledge and technologies, and how to overcome the challenges of their context.

5.3.3 Supporting Emergent Startup Communities in Middle-Income Countries

While social media has opened many new possibilities for learning how to innovate, it is highly likely that many startup communities in middle-income countries need support for improving
their visibilization processes. A report from Lasse-Herrmann, Marmer, Dogrultan, and Holtschke (2012) explained that while there is a global explosion of startup communities, most emerging communities have problems in connecting to global networks of innovation. These communities have deficiencies in their innovation practices, and little global visibility.

I believe we can provide economic, social, technical, and conceptual resources to allow emergent communities to make visible their current activities and enter into global innovation networks. Yet, supporting the visibilization processes of these communities will push the limits of what we know about visibilization, empowering people who are trying not only to change their work practices and activities, but also to transform their entire business culture. The social and economic benefits of allowing more people to be full participants in the global networks of innovation will be immense. While some researchers have investigated the processes behind the transformation of industries towards becoming innovation-based (Bahlmann, 2011; Miettinen, 2006), we know very little about how to design technologies and organizational interventions to empower innovators to transform their business culture and practices. Our knowledge of organizational interventions comes mostly from research within well-defined organizations, such as Engeström's (2001, 2008) program of expansive learning. We will need to radically expand our knowledge to understand how we can facilitate the formation of new concepts for entrepreneurs to continue expanding their innovation activities. In addition, the CSCW research on inter-organizational collaboration and cooperation (LeDantec & Edwards, 2010; Lee, Dourish, & Mark, 2006), and on knowledge sharing and innovation (Huysman & Wulf, 2004; Pipek, Wulf, & Johri, 2011) will provide valuable background for designing technical and conceptual tools for the visibilization of global innovation.
5.4 Conclusions

Global social media has made visible aspects of Silicon Valley that were opaque to those without direct connections with that region. This is transforming global innovation, as entrepreneurs in middle-income countries have taken advantage of the conceptual and technical resources that are carried with social media. For Mexican entrepreneurs, social media was a crucial resource to develop a startup culture. Yet, while social media can easily make work practices visible, it is critical to understand that these affordances are relational to the context. In a cross-cultural context, social media affordances might not work directly. I showed how in the case of the Mexican startup community, visibilization features of technology did not determine the communicative achievements of entrepreneurs. Rather within the constraints of entrepreneurs’ context and using technology, they achieved the visibilization of their work across cultures.

In the coming years, the global expansion of startup communities will continue. It is possible to provide economic, organizational, technological, and informational support to enable a greater number of startup communities in emerging regions and countries to become full participants in the global networks of innovation. These resources must provide support for startup communities in the hard semantic work of making visible, first for themselves and then for others, how to transform their industries to become innovation based, and then engaging with people of global networks to together make that transformation happen. Yet, entrepreneurs will continue to make strong commitments to fundamentally transform their industry, acquire new practices, build their companies, and expand their community. Only after these changes and transformations will they be able to create the concepts that will continue to enable them to be visible and relevant in global innovation networks.
Chapter 6. The Role of Face-to-Face Events in Building a Mexican Startup Culture

In this chapter, I analyze the case of Mexican Startup Weekend events where aspiring entrepreneurs formed teams to build products and launch startups over a weekend. This case is a prime example of how Mexican entrepreneurs appropriated elements from Silicon Valley, and combined the affordances of face-to-face interactions with social media to build a stronger community and startup culture.

Startup Weekend events were for many Mexicans their first encounter with Silicon Valley’s innovation culture and practices. Startup Weekends were designed to allow more Mexicans to very quickly become exposed to the ways of Silicon Valley. During these encounters participants were empowered by the potential of these practices to create new innovations. Leveraging the intensity of face-to-face interactions, the event provided an experience where participants realized the potential of these foreign practices to transform Mexico’s internet industry.

I first review related work that will serve in my analysis: globalization studies that illuminate how people appropriate practices in new contexts, and CSCW research on face-to-face interactions. Then I to present the findings, describing how Startup Weekend arrived in the country and discussing the impact of these events in the creation of a startup culture in Mexico.
6.1 The Global Flows of Innovation Practices

Globalization students including Appadurai (1996), Giddens (2000), and Iwabuchi (2002) have explained how the global flows of people and media move practices and symbols across locations. These practices and symbols are constantly appropriated in the new locations, fundamentally transforming the social institutions and culture of these new places. These global flows of people and media have existed for centuries. But the rate at which these flows are currently dispersing these symbols is fundamentally transforming the societies and cultures around the world (Giddens, 2000).

From an Informatics perspective, Irani, Dourish, and Mazmanian (2010), and Takhteyev (2012) have uncovered the work that goes into adopting innovation practices when collaborating across cultures. Takhteyev's (2012) study of software developers in Brazil analyzed how locality affects technological innovation in software development practices. Using the lens of practice, Takhteyev sought to understand what developers did and how their doings interacted with ideas and discourse, and the material elements of their practice.

What makes the Startup Weekend case different is the purposeful intent of the Mexican startup community to introduce this practice to transform their own business culture. This community was not passive in the global flows of innovation. They were seeking to facilitate changes across their doings, ideas, and discourse using resources from other locations. They were using these global flows to transform their own locality.
6.2 The Power of Face-to-Face Interactions

The designers of Startup Weekend events drew heavily from the Agile software development methodologies to create their event. This influence made the designers aware that teams working in highly collocated environments can dramatically increase productivity (Shore & Warden, 2007). While these methodologies have not developed systematic knowledge of why face-to-face collaboration works better, their suggestions have had profound influence in the practices of internet entrepreneurs around the world.

However, we can find a more systematic understanding of how collocation and face-to-face interaction can increase productivity, in the CSCW literature. Studies on radical collocation have shown that it dramatically increases the productivity of teams (Mark, 2002; Teasley, Covi, Krishnan, & Olson, 2000). CSCW research has also determined that there is no substitute for face-to-face interactions in building the strong interpersonal connections that make effective work possible (Nardi & Whittaker, 2002; Nardi, 2005). These findings allow me to analyze with rigor why the Startup Weekend events enabled many participants to experience an increase in their productivity, participate in powerful learning experiences, and increase their capacity to build strong connections.

6.3 Startup Weekend Background

The original concept of Startup Weekend was created as a for-profit company in 2007. In 2009 Startup Weekend was transformed into a non-profit organization based in Seattle, to “provide the
world’s premier experiential education for entrepreneurs” (Startup Weekend, 2011). More than 400 events, in close to 200 cities across five continents, were organized in 2011 (Startup Weekend, 2011). This non-profit organization supports local organizers to create these events globally by locating a trained facilitator for each event and by providing a large network of contacts and IT infrastructure. The Startup Weekend non-profit ensures uniformity of quality of all events, and a balance of participants (typically numbering from twenty to a hundred) with complementary skills: designers, developers, and people with business profiles including marketing, finance, public relations, and business development. On the first day of the event participants present their business ideas in the form of one-minute pitches in an open microphone session (see Figure 1).

![Figure 1. Pitching a startup idea to the audience during the first hours of the Guadalajara Startup Weekend.](image)

The public votes for their favorite ideas. The top ideas are selected, and teams of three to seven people are formed to work on them. The general stance of Startup Weekend is that all participants can use the intellectual property created in these events (Startup Weekend, 2011).
The rationale behind this concept is that the prototypes and concepts during the weekend are at such an early stage that they require a lot of work before they can become profitable (Startup Weekend, 2011). For this reason, it is highly encouraged that participants only share ideas in which they have not invested any time beforehand. On the second day of the event, teams work to build a product and test its market acceptance. Work is intense and highly collocated. Usually all teammates sit together at the same table (see Figure 2). Many teams work through the night. Business and technical mentors are available throughout the weekend to help the teams (see Figure 3). On the last day, teams present their product pitches to a panel of judges who evaluate the execution, innovation, and market viability of the product. Small in-kind prizes are often given to winning teams.

Figure 2. Teams worked at the same table to facilitate collaboration.

Figure 3. A mentoring session during the Mexico City Startup Weekend.
6.3.1 Startup Weekend Comes to Mexico

The involvement of the startup community was crucial for Startup Weekends to first become viable, and then to expand rapidly across the country. The first Startup Weekend in Mexico took place in Chihuahua in November of 2010, but as this effort was isolated from the larger community it had only local impact. A few months later, Santiago experienced Startup Weekend in Silicon Valley. In that event Santiago teamed up with three Mexican entrepreneurs. This team soon realized the strong potential of Startup Weekend to allow more Mexicans to learn about building a startup in practice.

During the spring of 2011, Santiago emailed several members of the startup community, recruiting volunteers to organize Startup Weekend events in Mexico City and Guadalajara. Seven people volunteered for Guadalajara and five for Mexico City. My connections with the Guadalajara startup community, and my personal belief in Santiago’s new initiative, led me to become leader of the team organizing the Guadalajara event. Thus, I experienced the complexities, frustrations, and above all, satisfactions of organizing these events.

Startup Weekends in Mexico were organized with a degree of autonomy from Startup Weekend US. At the events I observed, only three of the organizers and four of the mentors had experienced Startup Weekend in the US. Mexico City’s Startup Weekend facilitator was American. All subsequent events I observed were facilitated by Santiago, who was trained by the US organization to become an official facilitator. The community was able to organize the events independently, leveraging their experience in organizing technical and entrepreneurship events,
and the support they had from the rest of the startup community.

Mexican organizers handled most of the activities necessary to create Startup Weekends. Yet, the backing of the international Startup Weekend organization in the US was key for giving greater credibility and status to the event in the eyes of participants, local investors invited to the event, and local sponsors. Many participants and sponsors perceived an event supported by an international organization as being of higher quality than one that was locally organized. Also, having the facilitators trained by the US organization ensured that there was a consistency between the events in Mexico and those realized in other countries. Participants knew that what they were taking part in was very similar to an event in any other country.

After the initial events in Mexico City and Guadalajara, Startup Weekend expanded across Mexico very rapidly. In the first year, Mexico became the country with the second largest quantity of these events, surpassed only by the US. Startup Weekend was organized in thirteen cities across the country, with over thirteen hundred participants in total. Also, a local office from the non-profit Startup Weekend organization was created in Mexico to oversee the growth of the events in that country. This new office had two full-time employees, who worked hard to expand the events even further in Mexico. They quickly secured the sponsorship of large companies, universities, and venture capital funds, allowing them to create a more financially sustainable organization that would ensure support to the local organizers of the events.
6.4 Findings

Startup Weekend in Mexico was an opportunity to change the culture of the country’s internet industry to become more innovative, inspired by some elements of Silicon Valley culture. These events presented an opportunity to enact a culture of cooperation and innovation that is typical of Silicon Valley, but uncommon in Mexico. Startup Weekend’s participants, mentors, and organizers were eager to learn how to create startups. Following the innovation practices proposed by this event, they cooperated in teams and among teams to create their startups. The learning and cooperation experiences of participants during the event compelled more people to integrate into the startup community. The event became a symbol of how the internet industry in Mexico can be transformed.

6.4.1 Cooperation Is Normal in Startup Weekend Mexico, But Not in Mexico

To maintain the productive and stimulating nature of the event, Startup Weekend participants had to cooperate in meaningful ways, by sharing their ideas and working in teams with strangers. Organizers and mentors were volunteers who committed a substantial amount of time to the events. A cooperative culture is needed to organize such events. This culture is common in places such as Silicon Valley, but very unusual in the Mexican context. As I explained in Chapter 2, Mexican business people suffer from “cangrejismo,” a behavior making them act like crabs in a bucket pulling each other down rather than helping each other to get out.

The dynamics and interactions propitiated by the design of the event allowed participants to
work in a cooperative environment that was remarkable to the people who observed the event from the outside. Sergio, a former high-ranking official of several government economic agencies, came to observe Startup Weekend Guadalajara for a few hours. Sergio expressed surprise at how participants, many of them strangers to each other, could quickly start to cooperate in teams that worked to create a new business. Sergio explained that when he was in the ministry, it was hard to make Mexican businessmen cooperate with each other, even when there were clear business opportunities for all parties. The community spirit in Startup Weekend was also evident to Kav, a US-based developer who volunteered as Startup Weekend facilitator and ran the Mexico City event, tweeting from his account just before the event ended:

Mexico City has one of the most important things for a successful startup community: people who support and lift each other up.

Reflecting on Kav’s comments, two of the organizers, César and Arturo, commented that the startup community in Mexico was very different from what was happening “outside,” pointing out to the street. César explained that while the problem of “cangrejismo” was present in most Mexican industries, it did not impact the startup community in Mexico. The startup community in Mexico was greatly inspired by the culture of Silicon Valley, which aimed to create an environment of cooperation. This same environment was recreated during Startup Weekends.

6.4.2 Building a Culture That Is Inspired By, Not Copied from Silicon Valley

Several members of the startup community in Mexico identified a set of qualities that were
conducive to innovation in the Silicon Valley culture. These qualities included the capacity to learn from their failures, the ability to collaborate with each other, and being resourceful using whatever they had at hand. This view on Silicon Valley’s culture came from the entrepreneurs’ readings, travels to the area, and connections with some American entrepreneurs. These Mexicans wanted to cultivate these qualities into their own community. They wanted to move away from the risk-averse, distrustful, and un-collaborative culture that they perceived was dominant in most Mexican businesses.

For the startup community, Startup Weekend events were a new and effective way to allow wider audiences to experience how learning and collaboration enabled innovation. Many participants cooperated with each other, sharing their knowledge and time without looking for an immediate return or reward. Most mentors were ready to patiently share what they knew with participants of all levels of sophistication. For example, Jorge, an experienced consultant at a business accelerator, spent a great deal of his time explaining basic business concepts to any participant who would ask. I observed how teams experienced important problems, for example, not being able to organize to deliver a prototype by the end of the weekend. Participants also learned from these problems and reflected on factors to change on future occasions.

The startup community was very attentive to and reflective of how Startup Weekend was allowing these qualities to become embedded in the culture of their community. In my conversations with them, many Startup Weekend organizers, mentors, and participants discussed the effects of Startup Weekend in introducing innovation practices, and creating changes in the
behavior of the community. The community agreed that while they were seeking to cultivate some aspects of Silicon Valley’s culture, it was impossible to replicate this culture in Mexico. Rather, they had to adapt that culture to the Mexican context. For instance, César observed that in Silicon Valley successful entrepreneurs are the role models for upcoming entrepreneurs in the United States. However, the developing startup community in Mexico lacked successful entrepreneurs and had to seek mentoring in alternative ways. As an example, César observed how Carlos, a talented but young entrepreneur, took on a mentoring role during Startup Weekend events. In more mature startup communities, Carlos would have been receiving mentorship rather than giving it. But in the Mexican context, Carlos had plenty of experience to share, and was a great asset for Startup Weekend participants. César believed that the startup community in Mexico could not wait for role models to emerge, and instead had to “share what they had” and “build [the community and their companies] around those experiences.”

6.4.3 Learning from Lived Experiences

Startup Weekend allowed the startup community to create a learning environment where a greater audience could experience a culture of collaboration and innovation. The participants, most of whom came to openly learn and share what they knew, turned the stimulating environment of the event into a learning experience of building startups in practice. These learning experiences were created as participants worked under pressure to create a real product during the weekend, interacting with their teams, mentors, and fellow participants.

Participants gained a much deeper understanding of startup concepts, as they worked on real-life
cases, leveraging the experience of mentors and fellow participants. For instance Omar explained that he “really learned” about the business canvas model, a diagram widely used by lean startup practitioners to depict the business model of a startup. While Omar was familiar with the concept, working out a realistic scenario for his startup was “completely different.” Lengthy conversations went on among the team members in trying to make sense of how the model could be applied to their business situation. Arturo and César, who were more experienced using that methodology, mentored Omar’s team to build a realistic business model.

Working on real projects with real teams allowed participants to understand their capacities as entrepreneurs. The event was a learning experience for everyone, even for those working on projects that were not successful. A participant explained that “even for those whose [project] does not turn out well […] they find out what are their weaknesses, what they do not know and would like to learn in the future.” For instance, Manuel’s team failed to deliver a functional prototype by the end of the weekend. Manuel explained that despite the problems his team experienced in building a product, the weekend was “a very enriching experience, beyond my expectations to learn about startups.” After the event, Manuel explained that he felt much more motivated and confident to continue exploring his opportunities in entrepreneurship.

Participants learned from the difficulties of teamwork. A team in Mexico City, despite having talented individuals, could not reach an agreement on what to build and did not finish their prototype. A participant explained that this difficult experience was a chance to learn how “to deal with people […]. Because most of the time you cannot choose your team, and still you have
to get your work done.” Another team member from Mexico City learned his lesson from that event. When he later participated in Guadalajara’s Startup Weekend, he asked his new team to use “roman voting” to avoid taking too long on a single decision. Each teammate would vote with thumbs up or down, and then the team would move ahead with the most popular decision.

Participants developed a greater appreciation for the value of the work of other team members. This was especially true for participants with little experience with multidisciplinary teams, for whom the event was an “eye opener” in understanding the value of such teams. For instance, Angélica, an accountant and member of the Contabot team who was interested in building an internet business, had no experience with web development. She explained that “the most important thing” she learned was experiencing how to coordinate the work of all team members to create a viable product quickly. Through the event she came to understand the value of working with programmers and designers as a core part of the team, rather than hired external consultants.

6.4.4 **Empowering Participants to Transform Ideas into Products**

Startup Weekend was an empowering opportunity where startups could be built in a very short time. An enthusiastic person with a good idea could easily find a team to transform the idea into reality. Expert help from mentors was readily available. If a mentor was required, teams only needed to ask to one of the mentors who were wandering around the rooms. Teams would also ask for the help of other teams, to solve a technical issue and get quick input on a design.
Even though the organizers and participants of these events were some of the most sophisticated users of internet technology, they found the face-to-face environment to be much more convenient and efficient for work and cooperation. Being face to face allowed participants to be more committed and inspired to work on their project during the entire weekend. Having people with a diverse set of skills and opinions collocated in the same room encouraged informal conversations and collaborations that accelerated the creation of products.

Startup Weekend was instrumental for creating teams comprising complementary skill sets. This was the case for the Contabot team, who after winning the best-product nomination at the Guadalajara event, continued to work full time to create a successful startup. Vladi and Cris, the team members who pitched the idea, came from out of town and did not know anyone at the event. They needed an accountant and a designer. Vladi and Cris networked among the participants on Friday evening. They found the only accountant, Angélica, among the participants and convinced her to join their team. The event also provided an environment to focus on the project. Everyone on the team was sitting next to each other at a big table. Group discussions were frequent but quick, to allow people to work independently but with a clear direction. Team members encouraged each other to stay focused on their work. The assistance of mentors was beneficial in clarifying certain aspects of the business model. Talking with other teams about their business during recess breaks also served to validate certain aspects of the business. By the end of the weekend, the Contabot team had validated many aspects of their business model. The team realized that they had a promising product that they felt passionate
about. As the team bonded well, they continued to work together after Startup Weekend. They launched their beta version a couple of months after the event.

6.4.5 To Cooperate, Ideas Must Be Shared

A key practice in maintaining the environment of cooperation at Startup Weekend was that ideas, especially business ideas, were shared liberally. This practice is common among the startup communities of Silicon Valley and elsewhere, as well as communities related to the Open Source movement. Those who follow this practice believe that the benefits of sharing ideas, namely receiving feedback and gaining more accountability on the idea, outweigh the risk of having the idea stolen. They also believe that most business ideas have little value in themselves. What is valuable is the capacity of the entrepreneur to implement that idea.

Startup Weekend was an opportunity for spreading the practice of sharing ideas. The event organizers and some participants were already convinced of the value of sharing ideas, creating an environment where the rest of the participants who were still worried about sharing their ideas would experience the benefits of the practice. Many became convinced, such as Christopher, an internet entrepreneur new to the startup community and a participant in the Guadalajara event. Christopher explained to us that he had a list of ideas he wanted to work on, but being worried about someone stealing the good ones, he pitched the idea that he thought had the least potential. During the event Christopher experienced how feedback from team members, mentors, and people from other teams transformed ideas into something “much bigger […] something different than what you had originally conceived.” Christopher told us that if he was to
participate in another Startup Weekend he would pitch his “best” idea.

Organizers, mentors, and participants put great care into maintaining the practice of sharing ideas, as they found that this allowed them to keep the community collaborative and innovative. Eduardo, an organizer of the Mexico City event, explained that individuals who were overly zealous about their ideas would “slow down” the growth of the startup community. An incident involving a participant of the Mexico City event stressed the importance given to the practice. The participant, who pitched an idea of a social network for cats, complained over Facebook when another person in Guadalajara pitched a similar idea. The organizers of the event rushed to answer the person complaining, explaining that it is not possible to protect ideas and that there are plenty of existing social networks for pets. They cited the FAQ document of the official Startup Weekend site [18], which explains that it is nearly impossible to protect ideas, and that most ideas have been pitched before. It asserts that “what truly matters is how well you and your team execute the idea” [18]. After this “frustrating” incident, Eduardo explained it was necessary for the organizers to “build an understanding of how things work” among all Startup Weekend participants, implying that all should understand the practice of sharing.

6.4.6 A Catalyst for Building the Startup Ecosystem

The startup community in Mexico was actively trying to build a startup “ecosystem.” The positive experiences of the participants during Startup Weekend were a catalyst in bringing in more actors. The startup community used the term “ecosystem” to refer to the network of people, institutions, and resources needed to build startups. This ecosystem included entrepreneurs from
different backgrounds, skills, and levels of experience, as well as private investors, public and private funding institutions, large companies that create infrastructure, and universities. Organizers made an active effort to reach potential actors of this ecosystem who had not interacted previously with the Mexican startup community. The motive of organizers was very explicit: by putting people with a shared interest in startups into a shared activity they would start “exchanging resources between all of them,” and ultimately “create a network of people that builds up the [startup] ecosystem.” Organizers reached out to invite entrepreneurs, especially those who did not yet belong to the community, using social media, mailing lists, in-person visits to colleges, and traditional media coverage. Organizers also invited investors and government agencies to observe the event. These promotional efforts were well rewarded. For instance the event in Monterrey was organized at a design school, and many designers interacted with members of the startup community of the city. This facilitated more designers becoming integrated into Monterrey’s startup community, which lacked people from that background.

Various actors were able to better understand their role within the ecosystem by coming and participating in the event. Manuel, an aspiring entrepreneur who participated in Mexico City, explained that the event was a “mini-ecosystem” where he could clearly “see” how everyone’s work, including his own, fit together to build startups. Charles, a successful investor in the traditional industry and a professor at a top business school, participated in the Mexico City event as a regular attendee with the purpose of understanding startups from the inside. Charles wanted to help aspiring entrepreneurs grow their businesses from the investment side, not only
for the economic rewards but also because of his personal conviction about helping people generate wealth in the country. Charles continued participating in other activities of the startup community, including the advisory board of a newly created seed-stage fund for startups. He became a link with the investment community in Mexico to start investing in the new industry.

6.4.7 Startup Weekend Mexico as Symbol of Transformation

While the symbolic meaning of Startup Weekend did not immediately impact the larger society, this event started to become a symbol of the startup culture that could be generated in Mexico. These symbols started to acquire increasingly more visibility for people in Mexico interested in technology innovation. Startup Weekend made evident the potential of Mexicans to be creative and innovative. Both participants and observers of the event interpreted the experiences of cooperation and innovation during the weekend as a symbol of how the industry was transforming itself. As participants enacted innovation practices that were not typical in Mexico, they demonstrated how a culture of cooperation and collaboration was possible to achieve in the context of the Mexican internet industry.

Gustavo, a mentor for the Monterrey event, said that he was “stunned” to see how participants were ready to create innovative products, cooperate with each other even if it meant changing their original business ideas, and continue to learn from everyone else. Gustavo found that this mindset was a stark contrast with the “older,” risk-averse software companies he knew in Monterrey, which delivered software services using pre-packaged software solutions produced by foreign software companies. Gustavo explained that the older companies were not interested
in continuous education, never attended the relevant courses organized in the city, and saw their programmers as a commodity rather than business partners.

Startup Weekend was a symbol of the creativity of the Mexican startup community, as opposed to the destruction created by drug-related violence in Mexico. Monterrey in particular was hit hard by violence. A week before the event, a brutal incident took many innocent lives. As a result, the city had a negative image in the media. But in a note on a major international technology blog titled “Why Monterrey needed a Startup Weekend,” Vlad, one of the Monterrey organizers, explained that the event showed how “there are still a lot of people [in Monterrey] who build instead of destroy.” Startup Weekend participants felt that they were part of a change in the city. A few days later, one of the participants of the Monterrey event wrote on Facebook that he was “wearing my SWMTY [Startup Weekend Monterrey] t-shirt :-D So they can notice there are good things about this city…”

Many participants found these events representative of what they stood for, namely a young and ambitious group of people who are able to transform their reality and create with the support of their community. César, from Mexico City, was candid in his final remarks at the Startup Weekend Monterrey. He explained that he had initially been afraid to come to Monterrey, but overcame his fears and attended the event.

And we are here and we are building new things. The reason why this [Startup Weekend] is important, is that the greatest manifestation of human beings is the capacity to build, it is the capacity to create new things.
And the reason why entrepreneurship, design, and engineering are so fascinating is because all of them are about creating how things will happen. When you combine those three things, this is when you have the power in reality, not [just] in the rhetoric, to change the situation.

César, along with the rest of the startup community, found these startups to be profoundly meaningful. Monterrey and Mexico City were experiencing difficult times. Nevertheless, the startup community believed in their ability to transform the reality of their industry, their country, and the world, using the technologies that they were creating and the wealth that their companies could produce.

Startup Weekend symbolized the creative potential of the Mexican startup community in a global context. A few weeks after the Monterrey event, a blog devoted to Mexican startups compared the projects presented in Startup Weekend Monterrey with the projects presented at Tech Crunch Disrupt—a major event in the US presenting upcoming startups from Silicon Valley and elsewhere. The post explained that while the projects presented in both events were comparable in the creativity and timeliness of their concepts, the projects in the US event were much more “developed.” The authors of the post explained that while “we’re not that far behind in Mexico (specifically Monterrey) at least in idea… We need to improve on implementation.” The appeal that the authors made to the community in Mexico showed they believed in the talent of Mexican entrepreneurs, even if they need to work with dedication to create successful startups.

A year after the first Startup Weekend in Monterrey, once the startup community in the city had
started to solidify, Tom L. Freidman, a famous economist, visited Monterrey’s TEC, a prestigious private university, for a public lecture. Freidman (2013) wrote a column in the New York Times on his impressions of the trip, where he met students of the university from diverse backgrounds. Among these students there were a few representatives of the startup community of Monterrey who talked to the economist about the multiple activities of the community, Startup Weekends included. In his editorial, Friedman explained the growth potential of the Mexican economy, contrasting both the destructive forces of drug violence, as well as the creative drive of Mexican entrepreneurs, including those who were members of the startup community. Friedman’s column was one of the most emailed stories of the day of that prestigious newspaper, showing how slowly but steadily the activities of the startup community got more visibility, and started to become symbols of the transformation of Mexico.

6.5 Discussion

Takhteyev (2012) argued that while today many developers and entrepreneurs from around the world emigrate to and work in global centers of innovation, those who remain at home and have “global dreams” of creating technology innovations, must create the conditions for these innovations to become viable. To be successful, these entrepreneurs have a double duty: to excel in building up their products and companies, and at the same time create an environment where their companies can flourish. To become competitive in the global context of technological innovation, the Mexican startup community needed to create an environment conducive to innovation by making comprehensive changes in their industry. Towards this end, entrepreneurs
used Startup Weekend, a global resource, to change local conditions to enable innovation.

### 6.5.1.1 A Global Resource to Form Local Conditions

The Mexican startup community used Startup Weekend to build the capacities of aspiring entrepreneurs. Participants had a learning experience while creating startups in an environment akin to Silicon Valley: using lean startup innovation practices, while working in a culture of cooperation and innovation. Working together to achieve a concrete outcome, participants formed new, meaningful relationships with people with complementary skill sets. In this environment, it made sense to trust one another, to share ideas, to learn, and to work together. Organizers and participants effectively suspended the culture of the “outside,” namely the culture attributed to Mexican businesses where the mistrust and lack of learning resemble “cangrejismo.” Thus, during the Startup Weekends it was possible to create in Mexico a new environment of cooperation and innovation like in Silicon Valley. Creating such an environment, suspending the negative influences of the local business culture, was an innovation in itself.

To build such an environment, the local organizers had to mobilize a series of social and material resources. First, organizers had to cultivate the disposition of participants to learn a new practice. Then, organizers used the participating members of the startup community to provide an example of sharing and collaborating to those who were new to the community. Finally, the material resources, which included appropriate venues, food, and other materials, made all participants feel comfortable with focusing on their learning experience.
The design of the event encouraged participants to learn and cooperate. The event was advertised as a learning experience, attracting participants who were ready to learn something new. The event required participants to share their business ideas, and collaborate with each other in teams to create their products. The collocated environment made it easy to collaborate with teammates, sustained awareness of what other teams were doing, and encouraged informal interactions.

Startup Weekend was already established as a global practice. This made it easier for organizers to create an event that was appealing to local participants. The support of Startup Weekend US in sponsoring special guests and generating high-quality sponsors helped in convincing local participants to attend. To create a better event in Mexico, organizers used the experiences of other Startup Weekends, including those of the initial group of Mexican entrepreneurs who had participated in the events in the US. Finally, the Startup Weekend organization provided valuable human resources, including the facilitator who traveled from the US to the first event in Mexico City, and provided training to Santiago to certify him as an official facilitator.

6.5.1.2 Creating Symbols of the Mexican Startup Culture

The outcomes of Startup Weekend became a symbol of how the internet industry in Mexico could be transformed. The concrete products that participants developed during the event highlighted how they had “the power in reality, not [just] in the rhetoric, to change the situation,” as César explained during his final remarks at the Monterrey event. The teams worked in an environment of collaboration and innovation, similar to the environment in major centers of innovation. Many participants discovered how their existing technical skills, regularly used to
deliver non-creative services, could be applied to create high-value-added products. The community realized of their creative potential to face global competition.

Startup Weekend provided the community with a model to illustrate their position within the new industry they were aiming to create. Individuals were able to better understand their specific role within the startup ecosystem, since the event was a “mini-ecosystem” where everyone could see how work fitted together to create a startup. The event also provided a model to understand the position of the new industry against the backdrop of Mexico’s national reality. The industry’s creative potential and its use of community as a resource, rather than as a liability, was in stark contrast to destructive forces, such as drug trafficking, that were prevalent in the country. Finally, the event provided a model to locate the new industry in the landscape of the global high-tech industry. The community realized that they had the creative potential to compete on the world stage, although they would have to work to increase the quality of their projects.

The richness in meanings of Startup Weekend came from participants’ experiences during the event. Over the course of the weekend, participants created an experience of innovation, cooperation, and empowerment, for themselves and for each other. Participants experienced product creation as contributory, as they personally built the various components under an exhausting schedule, next to their teammates and fellow participants. In this tough process of creation, participants learned the limits and capacities of their individual skills, the power of working with teams, and the importance of learning from failures. Those who observed the event from a close vantage point, such as Gustavo the mentor, were “stunned” by the capacity of this
group of people to create innovative products. A new generation of the internet industry was being formed at Startup Weekend. This was a generation ready to work hard and take bold risks to transform Mexico’s internet industry.

The new rules and practices incorporated in Startup Weekend were key elements to create the context in which people could have these meaningful experiences. Under the rules of the event, people were prompted to share ideas, and form teams with others they did not know previously. The new innovation practices from the lean startup movement empowered people to create rapid results. These new rules and practices, along with the members of the startup community who supported the event, allowed participants to discover the creative potential they had as individuals, as teams, and as a community.

6.5.1.3 Beyond Brain Circulation

The Mexican case presents a new way of connecting to global networks of innovation. The structure of the network of Mexico’s startup community was fundamentally different from the brain circulation pattern featured in India and China (Saxenian, 2006). Instead of massive flows of people circulating, as described in the cases presented by Saxenian, a few Mexican entrepreneurs with global connections amplified their global ties to introduce a new practice to the entire startup community, enabling more Mexicans to understand the practices of Silicon Valley. The community was able to amplify the practice of Startup Weekend because they constituted a strong network, ready to work together. The community leveraged the strong ties that they had built in their online and face-to-face interactions. Santiago, who was part of the
initial group that experienced Startup Weekend abroad, quickly assembled a group from the startup community to organize the first events. A series of factors allowed Santiago to create this group. First, he had met them previously at events organized by the technical and entrepreneurship communities in Mexico. Second, this group had extensive experience in organizing events and strong support among the startup communities across Mexico. Finally, both organizers and participants of the events were primed to innovation practices, through reading international blogs and news sites, and discussing practices in Twitter and Facebook.

In turn, Startup Weekend served to expand and strengthen the network of the startup community. The powerful experiences participants shared during the event allowed them to know each other on a deeper level, and build meaningful relationships. While only some teams continued to work on their startups beyond the weekend, many participants grew closer to the startup community. Participants from other communities found a clear role within the startup community. Such was the case for Charles, who gained a better understanding of how he could support startups from his investor role. The event also allowed the startup community to expand to more cities. More participants were willing to replicate these events in other cities, as they experienced the power and richness of Startup Weekend.

6.6 Conclusion

The Mexican startup community deliberately initiated a process of cultural change to make Mexico a more viable place to innovate by acquiring new practices and connecting to global
networks of innovation. I argue that entrepreneurs used Startup Weekend to introduce new innovation practices, akin to Silicon Valley, into their industry. The event allowed entrepreneurs to create a more innovative and collaborative business culture in Mexico. During Startup Weekend participants and organizers created an environment of collaboration and innovation, filtering out the distrustful and conservative qualities of Mexican business culture. Startup Weekend became a symbol of the transformation of the internet industry, and the capacity of the members of the industry to compete globally. This symbol served as a model for participants to understand their individual role within the startup community, and the position of the Mexican industry within the landscape of global technological innovation. The community played out their strengths to create the Silicon Valley-inspired culture they desired. Even without the advantages of brain circulation, Mexicans capitalized on the startup community’s strong internal organization, and the aspirations of their members to innovate. Leveraging global innovation practices, including Startup Weekend and the lean startup techniques, this community was creating the conditions it needed to become a more innovate industry.
Section 3. Synthesis
Chapter 7. Innovation Infrastructures in Practice:

A Case Study of a Potential Success

At the time of writing this dissertation, the innovation infrastructures of the startup community were still in the early stages of development. The internet industry had not consolidated as an innovation-based industry, and there were no large, successful companies that had grown out of the community. Yet, there were initial cases of entrepreneurs who started having partial successes building startups with a high-growth potential. To understand how innovation infrastructures come together to support these partial successes, I analyze the case of a young entrepreneur and his startup to appreciate how specific infrastructures created by the community helped his activities. In discussing this case I will explore how the innovation infrastructures built by the community could potentially transform the activities of the entire community, eventually helping many more entrepreneurs achieve full success with their companies. Then, I consider the great challenges in continuing to build infrastructures that can scale to sustain the full transformation of the Mexican internet industry.

Carlos was a young Mexican developer and entrepreneur considered as a potential success among the Mexican startup community. In this chapter I analyze how, empowered by the innovation infrastructures of the community, he and his team built a competitive startup, Silicon Valley style. While Carlos’s startup had not yet achieved huge commercial success, it had reached important milestones. Thanks to their interesting product with strong market potential,
the startup obtained funding from two prestigious programs, one in Chile and the other in Hong Kong. These programs provided global connections to propel the startup into further growth. Few Mexican entrepreneurs had entered these kinds of programs.

Carlos combined global and local resources to learn how to become a developer and an entrepreneur. When Carlos was in college he made his first efforts to create an internet product. While these initial efforts were unsuccessful, he connected with the Mexican startup community, built a network of contacts, and learned important innovation practices. He formed a startup with a multidisciplinary team of young entrepreneurs he met at college and in the startup community. His startup received formal and informal mentoring from other entrepreneurs, which allowed his team to build a valuable product. Using a series of online resources, Carlos’s team applied for and got accepted into global incubation and acceleration programs.

Carlos’s case showed it was possible for entrepreneurs to use the incipient innovation infrastructures of the startup community to create a startup that was competitive at a global level. This was an indication that the community had the potential to become a center of innovation, and develop a solid startup culture. The community had created resources that had enabled at least a few entrepreneurs to, with time and effort, create world-class companies.

So why weren’t there many more cases of entrepreneurs like Carlos in the Mexican startup community? Many deficiencies impeded the community’s scaling up its innovation infrastructures to support a much larger number of entrepreneurs. The path to becoming a technology entrepreneur was only clear for those who were already members of the community.
While events such as Startup Weekend provided an initial approach to learning innovation skills, it was yet not clear for people outside the community how to master these skills. The few successful cases, such as Carlos, were not yet fully consolidated to become highly visible role models, supporting and exemplifying innovation in Mexico.

The community needed to solve the contradiction between the new possibilities to build a startup culture, embodied in cases like Carlos, and the deficiencies of their system to continue building the transformation of their industry. The key was to learn from those cases the concrete activities required for scaling up infrastructures. Yet, this was not a straightforward learning process. The people building innovation infrastructures required time and effort to translate these experiences into new concepts and new artifacts that made their infrastructures more useful. They needed to engage more people outside and within their community, in their efforts to create innovation infrastructures. They needed to reconcile the motivations and aspirations of everyone involved in the process of maturing these infrastructures.

7.1 Analyzing Early Examples of Transformation of the Industry

To analyze how the community was learning from these partial success cases I will use the concept of “germ cell” developed by Engeström (2008). A germ cell, in the organizational and social context, is an incipient concept of how collective activity can be radically transformed. This is “an abstract, simple explanatory relationship” of how activity could be in the future, but it has not fully fleshed out the details of this transformation (Engeström, 2008).
I argue that Carlos’s startup was a germ cell of how innovation infrastructures could radically facilitate innovation work in the near future in Mexico. The Mexican startup community was at a crossroads: they had achieved a few partial successes to support entrepreneurs and innovation work, but they needed to transform the practices of their entire industry. The successes were germ cells that provided Mexicans with new concepts of what it was possible to achieve in their country. The new concept was that it was possible to use the innovation infrastructures available in Mexico to create a world-class startup. This debunked the old preconceptions of what was possible, and what was not, in Mexico. It gave the entire community a guiding vision of what they could achieve, and what the basic elements for the transformation of their industry were.

Yet, the startup community needed to flesh out how to scale up its infrastructures. A germ cell in itself does not transform the practices of an entire social activity (Engeström, 2008), but rather people take these initial concepts to transform their activity and reach a new state: people must create new artifacts that support the new practices and activity, adjust their rules and divide their work under an appropriate scheme, and set new objectives for the new activity.

During the time of my study, the startup community was working out what changes were necessary for their activities to scale up their innovation infrastructures to sustain stable and reliable innovation in Mexico. This implied refining the existing initiatives, events, and applications, and creating new ones when necessary. They were seeking to divide the work to maintain and create those infrastructures, in ways that were sustainable and beneficial for both the community and the individual entrepreneurs. They were constantly evaluating and redefining
the goals, objectives, and desirable outcomes of their effort to balance the personal and community benefits, as well as the short- and long-term gains.

7.2 Carlos’s Case as a Germ Cell

Carlos’s development as an entrepreneur required a large set of social, cultural, economic, informational, and technological resources. The crucial turning points in his development were interactions with other entrepreneurs who expanded his understanding of what it meant to be a technology entrepreneur, and increased his motivation to work on his startup. These interactions were possible thanks to the incipient innovation infrastructures that the older members of the community had built. These older members viewed the partial successes, like that of Carlos’s team, as an encouragement for them to continue building these infrastructures.

Carlos majored in Computer Science at a college in Guadalajara, where he met the two friends, a marketing and a finance major, who would become his cofounders. In an interview, Carlos reflected that initial lack of knowledge about innovation practices made his team lose a lot of time. They wanted to create a product to facilitate electronic payments in Mexico, but as they did not know how to validate the specific needs of the market, they created an unfit product.

After that initial failure, the team approached the startup community, using the innovation infrastructures to learn about innovation practices, get mentorship, and connect to innovation networks. While many entrepreneurs in Mexico, especially those who had been to Silicon Valley, perceived their community as being still too small, for Carlos the community appeared
“well balanced.” While Carlos was cognizant that the community still needed to grow, the resources available for him at that point allowed him to develop as a more capable entrepreneur.

At the networking event Hackers and Founders, Carlos and his team met their fourth cofounder, a systems security expert who added crucial expertise for a startup where data security was paramount. The team also participated in a workshop named StartCycle, organized by the same people as Hackers and Founders. At the workshop the team learned in depth how to use the lean startup methodology to rigorously validate the next version of their product, allowing them to create a product that would be fit for the market. Also having a supportive community that understood and cared about their project allowed the team to deal with the pressures of working in a very uncertain industry.

After a few months, Carlos’s startup team decided to tap global networks of innovation to get funding to continue their development, seeking support of global seed funding programs. Social media was crucial for the team to discover and apply to these programs. Carlos learned about a program named Startup Chile, which was highly publicized on global blogs such as TechCrunch. This program, run by the Chilean government, invested in startups in return for entrepreneurs working at the country’s capital for six months. Through a friend, Carlos discovered an online platform named F6S.com, which listed global seed-stage funding programs and allowed him to apply online for the Hong Kong program.

The support of the Mexican startup community allowed Carlos’ team to become skillful participants of global innovation networks. At the StartCycle workshop they learned to make
compelling presentations for investors, crucial for in the highly selective programs they applied to. They also learned the lean startup methodology used in both global programs they participated in, allowing them to take full advantage of the mentoring and advice they received.

The team planned to come back to Mexico once they finished their programs abroad. They saw Mexico as their first market, since they perceived plenty of opportunities for electronic payments in this country. The team felt confident that it would be easier to build their company in Mexico, as they knew the culture better, and had stronger networks to find employees and business partners. Also, the team believed that once they came back from abroad, they would have more leverage and credibility to gain the support of investors in Mexico.

### 7.3 Making Innovation Infrastructures Viable

The startup community was as yet incapable to rapidly scale up their innovation infrastructures, due to a scarcity of human, economic, and material resources. Entrepreneurs often needed to choose between working on their individual startups and become role models for new generations, or working on initiatives with an immediate impact on the community. There was no simple solution for these dilemmas. The community sought to experiment with several approaches to balance the short-term needs with the long-term objective of building a stronger community.

Some entrepreneurs emphasized the importance of supporting startups that had greater possibilities to become highly successful within a short timeframe. This would provide the
startup community with visible role models, and spill success onto other startups. Andy, a Guadalajara entrepreneur, believed that what the internet industry in Mexico needed in order to solidify was for a company to have a “big hit”—a huge commercial success, followed by a multi-million dollar acquisition on very handsome terms, even by Silicon Valley standards, or an initial public offering in the stock market. Many entrepreneurs shared this view. Andy’s contribution was organizing a meeting for a select group of startup CEOs for them to share contacts and advice with their peers in taking their companies to the next level.

Others believed that the emphasis at this stage should be on supporting entrepreneurs in much earlier stages. They believed that the startup community was still not large enough, and most entrepreneurs lacked solid knowledge on innovation practices. Adherents to this view created some of the community’s social media applications (Chapter 5) and organized events including Startup Weekends (see Chapter 6), Hackers and Founders, and StartCycle.

To build innovation infrastructures their creators often first explored the needs of the community, experimenting with variations of their initiatives, and evaluating what worked. For instance, the organizers of Hackers and Founders found the community needed not only spaces to connect, but structured environments to learn innovation practices. Thus they created StartCycle. Carlos’s team was their first “success case,” combining initiatives to empower novice entrepreneurs to grow their startups. Yet, these organizers were aware that they needed to continue evolving and remain committed to their initiatives, as most participants in these initiatives had not yet mastered innovation practices. The need to be consistent and dedicated tested the motivation and
stretched the commitment of all events organizers, especially when the initiatives failed to yield the desired outcome. To continue, they had to remind themselves that they were shooting for a long-term objective, while balancing their short term needs and constraints.

Once an initiative was proven successful the organizers started to create formal structures that could support initiatives over time. For instance, Startup Weekend created an office with full-time staff to support the growth of this event in Mexico. Santiago and César—whom I introduced in Chapters 5 and 6 as organizers of diverse events, applications, and initiatives—were able to combine working on their seed-stage venture firm, Mexican.VC, with supporting young entrepreneurs. While working on such initiatives did not directly benefit their company, it gave them the chance to meet possible teams in which to invest.

7.4 Discussion

The first germ cells of entrepreneurs working within a new startup culture allowed the creators of innovation infrastructures to improve these infrastructures. The germ cells made concrete what worked in practice to enable innovation activities. For instance, the organizers of Hackers and Founders discovered that the attendees of the event needed a more structured environment to build their knowledge of innovation practices, and created StartCycle. The organizers of these events were not initially aware of all the needs of entrepreneurs.

The entrepreneurs who took the lead in creating infrastructures that facilitated the emergence of the first germ cells were working from their assumptions. The ‘blind’ work of these individuals
was crucial to start bootstrapping innovation. Even without precedent in their context, they were able to take inspiration and resources from other contexts, to materialize the conditions necessary for the first germ cells of the new activity to emerge. The emerged germ cells served to confirm that their assumptions were right, and their initiatives were worthy of supporting.

The learning process of the community was progressive, advancing as the community accumulated experience of how and why diverse events, applications, and initiatives worked or did not. There was no single person who could know in advance what was needed to create a solid startup culture. The community needed to build on each others’ experiences. It took time to incorporate the learning from these experiences within the infrastructures, and stabilize the changes for entrepreneurs to use them in practice.

7.4.1 Scaling Up: Creating New Concepts and Artifacts to Maintain Dialogue

To expand the infrastructures there was a contradiction: they needed to try different approaches, as they could not decide \textit{a priori} what initiatives would work best for the different needs of the community; and they experienced a lack of resources severely limiting what they could try. In this contradiction, the multiple perspectives and different priorities built tension among entrepreneurs. To overcome this contradiction and scale up their infrastructures, the community needed new concepts and artifacts that brought together multiple perspectives and motivations.

Engeström (2008) explained that a community can balance contradictions between its short-term and long-term needs if it has channels for dialogue. In the Mexican startup community there
were strong anchors for this dialogue: the community was connected, the members had shared aspirations, and they reflected on the needs, problems, and shortcomings of their community.

In the future, then, the community should focus its dialogue to reflect on the emerging germ cells as examples of how to concretely achieve the long-term objective to build a strong startup culture. For instance, the community could reflect on the example of Carlos and analyze the conditions that favored his development as an entrepreneur. Based on that evidence they could improve the existing innovation infrastructures. I believe that as germ cells accumulate, the startup community can progressively build solid innovation infrastructures. For instance, the creators of the Startup Weekend events (see Chapter 6) created a stable organization to spread the events across the country when they showed that the initial events were germ cells of how the startup culture could be in their country.
Chapter 8. Key Learning Processes to Create a Startup Culture and
Strengthen Innovation Infrastructures

In this chapter I explain what happens when a community builds innovation infrastructures. I analyze key learning processes that emerged once the startup community had built a number of innovation infrastructures. These processes allowed the community to build a strong startup culture. At its core, the transformation of the industry was about allowing people to learn how to work within a startup culture, namely a set of practices, understandings, behaviors, and values that make possible innovation. These processes enabled entrepreneurs to learn crucial innovation practices and connect to networks of innovation. Entrepreneurs learned to cooperate to create innovation infrastructures for their entire community. They learned to collaborate with each other within and across their startups in order to create more value for everyone.

The relationship between the key learning processes of the startup community, their startup culture, and the transformation of their industry is depicted in Figure 4. When the community builds innovation infrastructures, their members can start engaging in these learning processes. Increasingly entrepreneurs transform their practices in their companies and community, becoming more skilled to act within a startup culture. Over the course of my fieldwork, I observed how entrepreneurs transformed their innovation practices as they built an increasingly stable startup culture. I expect that, within the next two decades, the Mexican community will strengthen its culture sufficiently for a mature innovation-based industry to emerge.
I observed four key learning processes in the startup community: 1) transforming how entrepreneurs shape their aspirations; 2) creating learning experiences and networking spaces; 3) cultivating germ cells of activities in the new startup culture; and 4) and amplifying relationships, knowledge, and practices within and outside the community. These processes worked in synergy allowing the community to transform their innovation practices, and to strengthen their startup culture. First, these processes allowed more people interested in technology to aspire to become technology entrepreneurs. To become better entrepreneurs they internalized, or learned, new innovation practices and connected with other entrepreneurs and networks of innovation. When entrepreneurs learned innovation practices, they were capable of externalizing their aspirations to innovate, building startups and innovation infrastructures. These new startups and infrastructures enriched their community’s startup culture.

The learning processes were fundamentally social and collective. In the absence of role models and precedents of a culture of startups and technology innovation, entrepreneurs learned
innovation practices from each other. These learning processes were materially possible thanks to the innovation infrastructures built by the community. Entrepreneurs used the online and face-to-face spaces they had created. They partnered with others, received mentorship and advice, and organized to build new innovation infrastructures.

Based on the findings of this dissertation and the development of other startup communities (e.g., those described in Saxenian, 1996, 2006), I hypothesize that these four learning processes will be present in emergent startup communities. I argue that while we cannot directly mandate a community to start such learning, we can build new innovation infrastructures and bolster existing ones to support startup communities in middle-income countries. For assessing the benefit of building and supporting innovation infrastructures, we can empirically observe the impact these infrastructures have in a community’s learning processes. I believe this hypothesis is a valuable application of my findings, shedding light on how to design innovation infrastructures for supporting global startup communities.

Next I present the theoretical background for my analysis of the learning processes of the startup communities. Then I analyze each process, discussing how Mexican entrepreneurs used innovation infrastructures to enable people to participate in these processes. Finally, I discuss how to support startup communities in middle-income countries.
8.1 Theoretical Background: How People Learn and Create New Concepts and Practices Within a Culture

To explain how the community used innovation infrastructures to enable the key learning processes to create and learn a new startup culture, I will use concepts from activity theory (Engeström, 2008; Kaptelinin & Nardi, 2006; Vygotsky, 1978). Engeström (2008) explained that people require both material and conceptual resources to learn new practices and to transform the culture of their organizations and industries. For instance, when a factory wants to change its organizational culture to become more productive, it must combine new tools and machines, as well as concepts, methodologies, processes, and practices which together allow workers to be more efficient and create greater value. People combine material and conceptual resources to use them to transform the culture of their organizations and communities.

The specific dynamics of how people learn new concepts and practices, and create new symbols and artifacts that represent concepts and serve to carry on practices, can be explained by the concepts of internalization and externalization (Kaptelinin & Nardi, 2006; Vygotsky, 1978). In internalization, a previously external process starts to take place within the mind of a person. For instance, when a programmer is learning the constructs of a new computer language, at first he has to constantly refer to the documentation of the program. As he becomes a proficient programmer, he internalizes the constructs and almost never needs the documentation to write a piece of code. In another example, when an entrepreneur learns lean startup methodology, he will need the help of other people to guide him through the process of using that methodology to
create a new product. As the entrepreneur becomes more familiar with the methodology he internalizes its steps and processes, and does not need coaching to implement it.

Conversely, when people create new symbols and artifacts they externalize the initial concepts and ideas they have been working on within their own mind, to create symbols and artifacts that can be shared with others. For example, when a programmer has an idea for creating a new program, he uses the resources that are given to him by the computer language, and iteratively creates the new program for use by others. At first the program may not look like the idea he had in mind, but it is not until he starts to program it that he is able to understand what he wants to achieve, and subsequently implement it.

Internalization and externalization are complementary. A person internalizing concepts and practices needs to use the artifacts and symbols that another person has created previously—in a process of externalization. Continuing with the example of the programmer learning a new language, he was able to learn that language because another person had previously ideated a new language and externalized it as a new computer language. In the opposite direction, when a person externalizes a new concept, he has previously internalized other concepts that he uses to express himself. Similarly, the programmer creating a new program can to do so because he previously internalized the constructs of the language he is using to implement his new idea.
8.2 **Key Learning Processes in Detail**

The four learning processes for creating a startup culture are divided into those that serve to internalize the culture and those that serve to externalize ideas into concrete artifacts. The internalization processes allowed entrepreneurs to learn the new aspirations, values, norms, and innovation practices (upper half of Figure 5). The externalization processes allowed entrepreneurs to create startups and innovation infrastructures, using the knowledge they had previously internalized (lower half of Figure 5). These four processes worked in synergy to allow entrepreneurs build a solid startup culture in Mexico. As entrepreneurs internalized new
aspirations, and learned new practices, they were capable of externalizing their ideas to create new products and innovation infrastructures. When entrepreneurs externalized their ideas into concrete outcomes, they enriched the environment for others to participate in the startup culture.

8.2.1 Transforming How Entrepreneurs Shape Their Aspirations

The first learning process to internalize the new startup culture, was the profound transformation in how entrepreneurs shaped and expanded their aspirations. Thanks to social media they were no longer limited to role models in their home location. Instead, Silicon Valley stories ignited their passion and determination to build world-class companies. How entrepreneurs formed their aspirations was deeply social: recommending to each other what to read, commenting on how to apply those readings, and encouraging each other to follow their aspirations. And as the community developed, entrepreneurs who achieved a certain degree of success affirmed the aspirations of other members, especially the youngest. While there were still no big hits, the partial successes of fellow entrepreneurs increased the motivation to continue. Increasingly, Mexican entrepreneurs increased their confidence about becoming world-class innovators.

8.2.2 Creating Learning Experiences and Networking Spaces

The second process to internalize the new culture, was the capacity of the community to create learning experiences and networking spaces, which allowed entrepreneurs to learn practices, values, rules, methodologies, habits of mind, and discourses necessary to participate in the global networks of innovation. Entrepreneurs were able to put in practice the knowledge they acquired
from global social media when working with each other, reinforcing their learning of new innovation practices. When entrepreneurs interacted they created essential social connections for participating in this new culture. The community created these experiences and spaces by combining face-to-face interactions, such as Startup Weekends (see Chapter 6) or the Hacker and Founders events (see Chapter 7), with online interactions such as Noticias Hacker (see Chapter 5). These experiences and spaces allowed aspiring entrepreneurs to become proficient members of the startup culture, and allowed seasoned entrepreneurs to continue learning and connecting.

8.2.3 Cultivating Germ Cells of Activities Within the New Startup Culture

As the members of the community internalized the aspirations and knowledge to participate in the startup culture, they became able to externalize their ideas to innovate concrete actions. The members of community started to have partial successes, such as producing startups with fast growth and gaining more visibility within global networks. These partial successes were germ cells (Engeström, 2008; see Chapter 7) that showed the basic elements of how to change the community’s activities to reach the new, desired state. The cultivation of these germ cells was the third learning process. I characterize this process as “cultivating,” because creating these germ cells of the transformed activity was the product of the purposeful work of specific people. While these individuals could not ensure a specific outcome of their actions, they were actively seeking to create new symbols for the transformation of their community. For instance, the case of the first post that covered the community on TechCrunch (see Chapter 6) was a germ cell for increasing the community’s global visibility. It required the purposeful action of Eoin, Eduardo,
and Rocío, who worked assiduously to achieve this publication. They hoped to create a symbol to inspire others to continue working for global visibility.

8.2.4 Ability to Amplify Relationships, Knowledge, and Practices Within and Outside the Community

In the fourth learning process, the community organized to share and amplify their limited relationships with global networks to maximize the number of Mexican entrepreneurs connecting to and learning from these networks. A prime example of how the community amplified their relationships and knowledge is the spread of Startup Weekend events in Mexico (see Chapter 6), which over time became a solid institution for the advancement of the startup culture in the country. The community also organized to amplify their relationships within Mexico, strengthening their capacity to cooperate, and to expand the community in Mexico. The community was able to organize to amplify their resources, thanks to their shared values and vision, and the practical capacities that social media and internet technologies gave them. This amplification process was crucial for the community as a whole to externalize their capacity to work within the new startup culture. It allowed them to overcome the scarcity of resources, using their partial successes as germ cells that catalyzed changes within their collective activity for bootstrapping a startup culture in Mexico.

8.2.5 Material and Conceptual Resources Make Learning Processes Feasible

The infrastructures supporting the learning processes had both conceptual and material
components. The conceptual components of the innovation infrastructures—such as visions, narratives, rules, models, and methodologies—gave direction to the actions of entrepreneurs. The material components—such as meeting spaces, events, and social media—made their actions to innovate materially possible.

While many of the conceptual components of their infrastructures were inspired by Silicon Valley, entrepreneurs reflected deeply on how to use those concepts to transform their local context. For instance, they conceptualized that the culture of their community should be based on collaboration and continuous learning, both hallmarks of Silicon Valley culture. To achieve this culture they could not just behave as they would in Silicon Valley. Rather, they actively worked to oust the mistrustful spirit of cangrejismo, common in Mexican business culture (Chapter 6).

Social media applications, meeting spaces, and learning and networking events worked in conjunction with these concepts to allow entrepreneurs create a new startup culture. For instance, the conceptualization of how the community was working without cangrejismo came about during a Startup Weekend event. The community developed a concept of the need for a circle of influence in a conversation that took place in Noticias Hacker. Global technological resources, including software frameworks, APIs, and cloud computing, dramatically lowered the time and cost to create products, making it feasible to innovate even with limited financial resources.

### 8.3 Assessing the Consolidation of a Startup Culture

The findings on learning processes of the Mexican startup community can be a stepping-stone to
build more general knowledge about the development of other startup communities in middle-income countries. To create a testable hypothesis, it is important to have a point of comparison between cases. While innovation infrastructures differ across communities, we can compare the overall outcome of the community’s activities, and their developmental trajectory.

An important indicator for assessing the success of a startup community is observing if the community has produced startups that have become successful companies. By successful companies I mean medium to large operations, producing several million dollars a year in revenue, with a sufficient value to be either acquired in multi-million dollar acquisitions, or to go into an initial public offering in the stock market. A large body of research from multiple academic perspectives (e.g., Ahuja, 2000; Brüdel & Preisendörfer, 1998; Saxenian, 1996; Shan et al., 1994) and practitioners’ accounts (Feld, 2012; Lacy, 2011; Senor & Singer, 2011) supports that a startup community can be considered consolidated after the first few successful companies emerge. These companies bring great economic and business strategy benefits for the entire community, namely capital, role models, and expertise, empowering other startups to also grow into successful companies. This indicator is important because it can be externally verified, providing a rapid way to understand if the community has successfully transformed its industry.

A second indicator for assessing the degree of development of a community is its capacity to institutionalize its innovation infrastructures. By institutionalize I mean creating new institutions or using existing ones to take care of the creation, growth, and maintenance of innovation infrastructures. By institution I mean an organization of people, supported by various material
resources, who share a web of values, norms, rules, beliefs, and taken-for-granted assumptions (Barley & Tolbert, 1997). Thus, given this definition, institutions include for-profit companies, non-governmental organizations, public institutions such as government ministries and universities, and associations with a formal membership. I would like to stress that for-profit companies are very efficient at institutionalizing innovation infrastructures. For instance, the major global blogs of the industry, such as TechCrunch, are for-profit companies, that continue to provide service to the community, regardless if the founders are still part of the company.

This indicator comes from analyzing the findings of this dissertation and the accounts of other successful startup communities (Saxenian, 1996, 2006). A startup community is only able to develop successfully if it produces innovation infrastructures that sustain its learning processes over a prolonged period of time. Importantly, only institutions can sustain infrastructures over these long periods. During the creation phase, most innovation infrastructures are the result of the effort and persistence of driven individuals; however, the operational capacity and commitment of a single person or small group is limited. An institution allows an innovation infrastructure to prevail even if a single person cannot continue his or her commitment towards building that infrastructure. For instance, Startup Weekend in Mexico was initially pushed by driven individuals, but became a crucial fulcrum for the development of the Mexican startup community only after it established an office in Mexico, ensuring its expansion all across the country. This case contrasts with that of Noticias Hacker, which declined when the founder, despite being convinced of the need for the application, could not continue devoting time to it.
The community’s ability to create institutions is a useful indicator to steer the development of innovation infrastructures for producing successful outcomes. This indicator allows understanding the developmental trajectory of a community well before it produces successful companies. The historical examples of Silicon Valley and the Indian startup community show that the institutionalization of innovation infrastructures catalyzed their development into full maturity. For instance, Stanford University has been instrumental in building and sustaining Silicon Valley’s innovation infrastructures for connecting entrepreneurs and allowing them to learn innovation practices (Saxenian, 1996). For the Indian startup community, the non-governmental organization The Indus Entrepreneur (TiE), has efficiently connected entrepreneurs with investors and mentors, bringing capital and expertise from Silicon Valley to India (Saxenian, 2006). Considering the cases studied by Saxenian, it is likely that if the Mexican startup community continues its institutionalization for its infrastructures, it will consolidate a new industry in about two decades. This consolidation will come after the first companies achieve important success, and their founders can in turn support younger entrepreneurs.

### 8.4 Learning Processes to Transform Industries in Middle-Income Countries

I hypothesize that the key learning processes I observed in the Mexican startup community will be present in other middle-income communities seeking to transform their culture and industry. While there will be variations in how each community specifically uses innovation infrastructures to overcome the challenges of its region, the general structure of the learning processes will be similar. I base my hypothesis on my observations that global social media and
internet technologies have fundamentally transformed how individual entrepreneurs build their aspirations and learn new innovation practices. Then, to transition from individual processes to a collective activity, the entire community must articulate its aspirations and organize its work towards a common vision. This transition will require a collective learning process where the community builds a common vision, creates artifacts to internalize the new culture, and externalizes their ideas into concrete actions to transform their industry. To verify this hypothesis we can observe the development of a startup community, and distinguish how its innovation infrastructures are used to support its collective activities. We can verify how that community forms its aspirations, how people learn innovation activities, how they create startups, and how entrepreneurs access the necessary resources to innovate.

I expect that the learning processes I analyzed here will help transform the business culture of the entire industry in other locations, besides Mexico. There are two observations on which I base this hypothesis. First, the outcomes of these learning processes allow people interested in technology innovation to feel empowered to innovate. Takhteyev (2012) explained in his study of Brazilian developers that they felt disenfranchised to create technology innovation, not because they lacked technical proficiency, but because they believed they lacked the symbolic power to innovate. Those developers believed that their work would not be recognized because they were not located in Silicon Valley. In contrast, as the Mexican entrepreneurs underwent these learning processes, they started to develop a strong sense of their capacity to become innovators, and increase their connections to global networks of innovation.
Second, these learning processes allow people to build conceptual and material resources which allow them to participate in a new business culture, one that is more innovative, open, and collaborative than is usual in middle-income countries. Contrasting the findings of Kow’s (2011) study of a community of computer game modification (modding) developers in China, against my findings of the Mexican startup community backs up this observation. Kow (2011) found that the community he studied could not transform its industry due to its lack of material and conceptual resources for empowering people to participate in an innovative culture. While there were many people interested in computer games in China, few people considered participating in the modding community. There were no visible paths to access the existing modding community, and incentives for doing so were not clear. Moreover, Kow found that the existing modding community in China worked within the traditional business culture, which is centered on the notion of a “core team.” The core team that was creating the mods had a lot of trust internally but was hermetical to outsiders. Thus, as modding followed the cultural pattern of the core team, there was no means for others to become part of their community. This community was not able to change the cultural patterns, which impeded its expansion. In contrast the Mexican startup community purposefully created many initiatives, including events and social media applications, which encouraged the participation of an increasingly large number of people. The rules of these events and applications encouraged participants to share their experiences, knowledge, and work with others. Thus, the participants of these events and applications started immediately experiencing the value of being part of an open startup community. The members of the startup community sought to expand their community with the explicit purpose of
transforming the prevalent cultural patterns of closed business in Mexico. As the members of the startup community created more symbols of a new, more open business culture, they were transforming the traditional patterns of their culture that they perceived as working to the detriment of technology innovation. The germ cells that emerged within the Mexican startup community became visible symbols of what that new startup culture would be like, and of the ability of the community to consolidate that culture.

Strengthening the innovation infrastructures of startup communities in middle-income countries would allow them to accelerate their learning processes, transforming their culture and industry. The core problem in strengthening these infrastructures is to help communities to solve the contradiction between each entrepreneur’s short-term needs, and their community’s needs. Most communities are likely to experience a resource scarcity, making this contradiction difficult to solve. This is the case for the Mexican startup community, which constantly experienced scarcity of resources, and often had problems creating institutions that supported its infrastructures.

To overcome this situation startup communities must work together, prioritizing their efforts. The solution will come as communities create common visions that direct their work long-term, and create narratives and concrete concepts to realize those visions. To facilitate this semantic work it is necessary to support the conversations between those involved in the creation and institutionalization of innovation infrastructures. More research is needed to create organizational and technological interventions to support the conversations to bring together the perspectives of entrepreneurs, investors, universities, governments, and platform companies.
8.5 Conclusions

In this chapter I analyzed the learning processes that were allowing the Mexican startup community to create a startup culture and eventually to transform the industry. This analysis allowed me to create a hypothesis for how we can empower startup communities in middle-income countries. I sketched the dynamics of this transformational process, explaining how innovation infrastructures are crucial to enable these key-learning processes to create a startup culture. While the initial push to transform an industry often comes from driven individuals, it is crucial to create institutions that can sustain innovation infrastructures over several decades. Other experiences show that solidifying an innovation industry is a complex effort that spans over decades. These efforts have to be incrementally transferred from driven individuals to solid institutions. To create lasting change to transform industries to become innovation-based startup communities need solid institutions that sustain their innovation infrastructures. There is great urgency to learn how to support the transformation of industries in middle-income countries to become innovation-based. We need more research to understand how to empower more people in middle-income countries to participate in the innovation economy. To learn how to bolster startup communities, I believe that researchers and practitioners must work together working to amplify the positive outcomes of increasing the global capacities to create technology innovation, and mitigate possible negative consequences.
Coda: Expanding Innovation-Based Industries in Middle-Income Countries

I expect that the emergence of innovation-based industries in middle-income countries will have social and economic impacts comparable to the impacts of the industrialization processes in those countries. As middle-income countries have industrialized, they have been capable of increasing the standard of living of their population. At the same time, their industrialization process has also caused serious social and ecological problems.

We are still at the early stages of the expansion process of innovation-based industries. There are many challenges in the process of creating global innovation-based industries. Middle-income countries must create infrastructures to transform their local culture and environment to make innovation more viable. At the same time, there is a need to create resources that will further increase the ability of people in middle-income countries to participate in global networks of innovation. I believe that the organizations, communities, and countries that commit to solve those challenges will benefit from the social and economic opportunities spawned from creating innovation-based industries.

The emergence of innovation-based industries in middle-income countries is accelerating thanks to new technical, social, and conceptual resources that facilitate innovation. Migration flows to and from Silicon Valley made it possible for the first startup communities to emerge outside this center of innovation. A new wave of startup communities is becoming possible thanks to these new resources to innovate. Countries and regions without migration flows from Silicon Valley
are now becoming capable of creating technology innovation. Originally, people in Silicon Valley created these resources for supporting their innovation work. These new resources have fundamentally transformed how people learn innovation practices and connect to innovation networks, enabling entrepreneurs in middle-income countries to push forward their industries. This is exemplified in the Mexican startup community case, which also shows the intense work people must do to make full use of these new resources. Only when this community created solid innovation infrastructures were they able to use global resources efficiently.

People from the main centers of innovation and those from middle-income countries must cooperate to expand innovation-based industries in middle-income countries. Startup communities in middle-income countries are tirelessly working to create their innovation infrastructures. To build those infrastructures, the resources created by organizations located in the main centers of innovation are crucial. These organizations include NGOs that support entrepreneurship, venture capital funds, media companies, and large platform companies. I expect that the great rewards of this process will motivate an increasingly large number of organizations around the globe to support innovation-based industries in middle-income countries.

Organizations in the main centers of innovation have created resources that enable entrepreneurs to learn new practices, dramatically increase their efficiency, and bring the costs of creating technology innovation down. The challenge that remains is to create resources to empower entrepreneurs in middle-income countries to create deeper connections with people in global
networks of innovation. While social media allows entrepreneurs to learn new practices, and understand how global networks operate, this is not sufficient. They still need easier ways to create deep, meaningful, and direct relationships with investors, business partners, and other entrepreneurs in the main centers of innovation. Organizations that create resources to facilitate these connections will become central players in the new networks of innovation. These organizations will be able to capitalize vast benefits for brokering these connections.

Startup communities must create solid institutions to sustain their innovation infrastructures. Transforming the local environment and business culture of middle-income countries is a long-term process. Without solid institutions, infrastructures will not endure the process of transforming the local context to become conducive for innovation. At the same time, those infrastructures must remain flexible enough to meet the changing needs of entrepreneurs. I consider that startup communities must ally with governments, universities, and large companies in order to gain access to resources that will allow them to institutionalize their infrastructures. To be able to create such alliances, startup communities must create clear visions and concrete plans to engage and coordinate multiple people and institutions from outside their communities.

Startup communities must also work to make their industries open for marginalized groups. The emergence of these industries can bring new economic, professional, and personal development opportunities. In middle-income countries, however, large groups have been historically relegated from new development opportunities, including women, people from low social classes, and those from rural areas. It is imperative for startup communities to allow broad
participation of these relegated groups in the new innovation-based industries. Otherwise, the emergence of these industries will only further aggravate the social and economic disparities. At the same time, if the new innovation-based industries do not become inclusive, they will lose the creative potential of a diverse workforce.
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