

**Mimetic Processes in Entrepreneurship Ecosystems:
the Cases of Mobile Technology
Entrepreneurship Networks
in Nairobi, Kathmandu and London**

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St. Cross College
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Thesis submitted in partial fulfillment of the requirements for the degree of
DPhil in Information, Communication and the Social Sciences
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Abstract

This qualitative study of networks of entrepreneurs in the mobile technology industry in three ecosystems—Kathmandu, Nairobi and London—examines perceptions and attitudes of entrepreneurs related to their networking activities. The focus is on understanding the entrepreneurs’ motivations for, and benefits and risks of networking, as well as the overall trends of development of the three ecosystems, which are very different from each other in terms of socioeconomic circumstances. The findings provide new insights into the link between the concept of a community of supportive peers and the acquisition of subjective resources, such as self-efficacy and legitimacy, while also supporting conclusions of earlier empirical and theoretical work linking networks with the acquisition of resources necessary for founding and building a new firm.

A comparison of results across the three ecosystems uncovers a strong tendency towards institutional convergence of the three ecosystems based on a model inspired by the Silicon Valley experience. The mechanisms through which this is found to occur are mimesis and storytelling, motivated primarily by learning goals and the pursuit of legitimacy for entrepreneurial action in the mobile technology industry, as well as for the individual ventures. The overall finding emerging from the cases is that, despite significant differences, the three ecosystems are reliant on a shared pool of relevant information and knowledge, via the Internet and through personal and organizational connections. They resemble one another not only in terms of resources sought by entrepreneurs through their networks, but also in the ways entrepreneurs signal their purpose and value to their community, and in the way they describe their environment—through references to other entrepreneurship ecosystems.

In the absence of an existing theoretical approach to analyzing convergence of diverse entrepreneurship ecosystems, the study proposes a framework based on DiMaggio and Powell’s theory of institutional isomorphism, and integrating the works of Wiewel and Hunter, on legitimacy-building by association through networks, and Djelic, on the process of cross-national transfer, or export, of economic models. The type of isomorphism perceived is termed “aspirational,” since it is found to occur in the context of pursuing a specific outcome previously achieved by the application of a particular institutional model. The difference between “aspirational isomorphism” and behaviours described by DiMaggio and Powell lies in the interpretation and adaptation of a model that can then be embedded in a nascent institutional environment (in this case, an entrepreneurial ecosystem). Rather than pure mimesis, aspirational isomorphism is a flexible and creative endeavor.

To Jason and Anders

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1. Introduction

Every man I meet is my superior in some way. In that, I learn of him.
(Dale Carnegie, 1936)

The idea that social connections are essential in most areas of human endeavor, not least of all business, is far from new. Even among computer programmers and technology entrepreneurs, who are stereotypically described as socially awkward or aloof “geeks,” social networking—the conscious meeting of people and exchange of information online and in person—has become a standard part of pursuit of opportunities and resources. The trend has not gone unnoticed by scholars. Networks have been studied extensively by researchers in economics, sociology, psychology and other disciplines, and in the context of interdisciplinary fields such as management, innovation and entrepreneurship studies. According to Granovetter, economic behaviour in general has not been adequately interpreted in the context of interpersonal relations, in spite of the fact that most human action, including economic activity, is deeply embedded in interpersonal relations (1987). Further, Granovetter notes that informal social interactions are an important factor in the way firms interact and organize their activities:

The distinction between the "formal" and the "informal" organization of the firm is one of the oldest in the literature, [...] observers who assume firms to be structured in fact by the official organization chart are sociological babes in the woods.

(Granovetter, 1987, p. 502)

The informality of many social networks, or at least the lack of familiar formality expressed in traditional organizational setups, makes studying them methodologically challenging. Thus, while the causal relationship between the capacity or quality of

personal networks of entrepreneurs and the ultimate success of their ventures is often implied (Aldrich & Zimmer, 1986), it is by no means self-evident, either empirically or logically (Johannisson, 1995). Theories related to entrepreneurship and interpersonal networking have suggested that spontaneous as well as calculated interaction is needed for the survival for every firm, and especially for firms operating in a complex ecosystem (Stacey, 1995; Morgan, 1983).

To date, the emphasis of network research has been on formal arrangements that can be quantified and compared to startup success (Powell & Grodal, 2005), and studies overwhelmingly find a positive relationship between networking and a number of independent variables of such success: discovery of opportunities (see, for instance, Burt, 1992); acquisition of tangible and intangible resources (Birley, 1985; Szarka, 1990; Ostgaard & Birley, 1994; Johannisson, 1995; 1996); securing of finances (Uzzi 1999; Shane & Cable, 2002); and entrepreneurial outcomes including perceived legitimacy and revenue growth (Stuart et al. 1999 and Baum et al.).

Surprisingly, the motivations of entrepreneurs to engage in networking and the risks of such activities (for instance, idea theft or loss of time), as perceived and expressed by entrepreneurs themselves, have been given considerably less attention in theoretical and empirical studies, despite recognition that understanding them may have a profound impact on the pace and direction of entrepreneurship research (Johannisson, 2011; Simard & West, 2006). Beyond expanding academic knowledge, there are practical implications of questions related to motivations for and risks of networking. Innovative entrepreneurship is widely considered to be a key contributor to economic growth and general welfare (Thornton et al., 2011; Baumol, 2010; Audretsch et al.,

2008; Birch, 1979). This is particularly the case with entrepreneurship in technology-intensive industries, which are considered to be important for competitiveness in the “knowledge economy” (Powell & Snellman, 2004). Entrepreneurship, however, is a relatively new subject of academic research, with considerable debate and divergent conclusions among scholars. The impact of this disagreement extends beyond academic understanding of entrepreneurship. For practitioners, it can result in advice based on anecdotal evidence, which can have uncertain outcomes. For policy makers, the absence of clear direction from scholars can result in conflicting or vague prescriptions that are difficult to implement. This has contributed to many policymakers turning their attention to a handful of high-profile notions arising from related fields, including management and innovation studies; these include the promotion of regional high-tech clusters (Porter, 1990; Saxenian, 1994), preparedness for “disruption” (Christensen, 1997), and capitalizing on “open innovation” (Chesbrough, 2003). While useful in terms of highlighting changes in social networking behaviours that influence new and existing firms, such concepts offer limited insight into the nuances of underlying entrepreneurial processes. The recent rise of technology-driven entrepreneurship around the world (Thornton et al., 2011; Upwardly Mobile, 2012), which has occurred simultaneously with advances in information and communications technology (ICT), presents an opportunity to add to the understanding not only of the role of networks in entrepreneurial process, but also of the role of entrepreneurs at different points in the establishment of a new industry.

1.1. Research Questions and Literature Gap

Few studies have examined entrepreneurs' own insights into the role, value, and costs of personal networks in their entrepreneurial journey (Johannisson, 2011), and thus it is not clear whether the pursuit of resources available through networks represent the only, or even the primary type of motivation for entrepreneurial networking activity.

Clarifying this could help researchers better understand entrepreneurial behavior and help policy makers formulate programs to stimulate entrepreneurship. Empirical studies of the role of networks of entrepreneurs in the early stages of industry formation are also somewhat limited, although notable examples do exist; among the most influential is the 1998 study by Granovetter and McGuire on the beginnings of the electricity industry in the United States. They found that the eventual model adopted by the power utility industry was "one of several possible outcomes, and not necessarily the most technically or economically efficient" (Granovetter & McGuire, 1998, p. 149). Instead, the particular outcome was the result of friendships, shared experiences, individual and corporate dependencies and deliberately expanded social networks that ensured profitability for an inner circle of industry pioneers (Granovetter & McGuire, 1998).

In an effort to complement current knowledge in these areas, this study focuses on the burgeoning interpersonal networks of entrepreneurs that have formed spontaneously in the context of the mobile technology industry around the world. It asks two overarching sets of questions:

- 1) What motivates entrepreneurs to participate in social networking activities? In particular, what kinds of value or benefits do entrepreneurs consciously pursue

through informal networks? Further, what kinds of risks do entrepreneurs consciously assume by participating in informal networks?

- 2) What is the role of interpersonal networking activities in the evolution of “innovation ecosystems,” and does it vary depending on the level of development or other features of the “ecosystem” or from country to country? For instance, are entrepreneurs more or less likely to collaborate or compete at a given point? Further, do informal networks, over time, give impetus to some types of formal, institutionalized exchanges, including, but not limited to, partnerships or industry associations?

Thus, the study intends to increase our understanding of motivations of entrepreneurs for networking, and the impact of such activity on the wider “ecosystem.”

The first set of questions builds on the “resource-based view” of entrepreneurial networks (see, for instance, Wernerfelt, 1984; Barney, 1991; 2001; Peteraf, 1993 on resource-based competitive advantage of a firm, and Eisenhardt & Schoonhoven, 1996 for an early, and Hoang & Antoncic, 2003, for a summative discussion of the resource-based view in context of entrepreneurship). By placing the emphasis on the perspectives of entrepreneurs regarding the benefits and risks inherent in networking, the questions allow the study to uncover insights into the reasons behind entrepreneurs’ behavior. The second set of questions is comparative in nature, and requires consideration of separate ecosystems at different stages of formation (since considering the same ecosystem at different points of development is not possible due to the time limits of this project). For this comparative analysis, the study relies on case studies of interpersonal entrepreneurship networks in the mobile technology industry in three cities where the

sector is at different stages of development: Kathmandu, Nepal; Nairobi, Kenya; and London, United Kingdom.

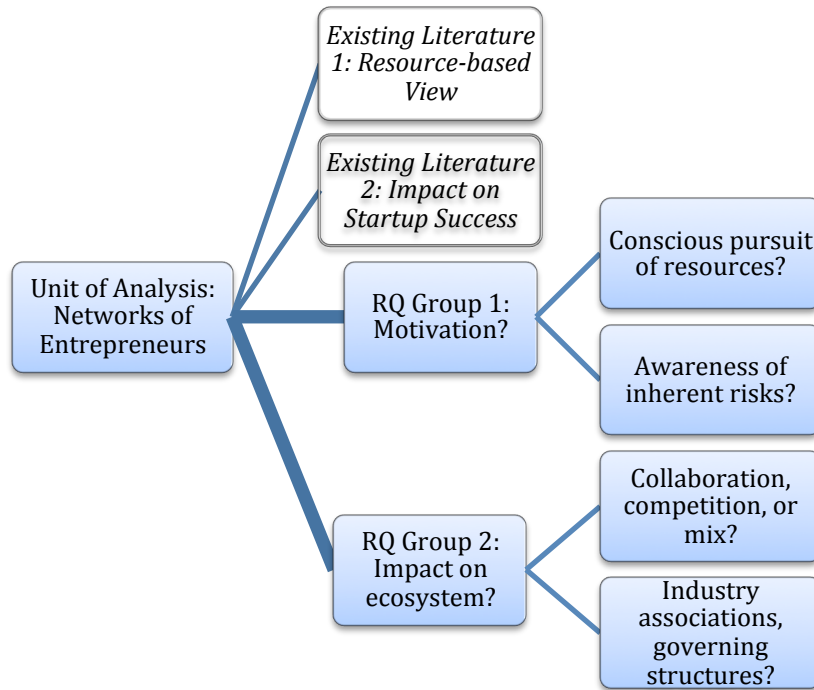


Figure 1: Overall Approach for the Study

Figure 1, above, is a visual representation of the approach, with shaded rectangles indicating areas of inquiry, and white rectangles indicating areas covered by existing literature. The unit of analysis is indicated in the first column: networks of mobile technology industry entrepreneurs in the cities of Kathmandu, Nairobi, and London. The second column shows broad categories of existing research (the two rectangles at the top of the second column) and the areas covered by research questions of this study, which aim to supplement existing knowledge. Much of the available literature on entrepreneurial networks can be broadly grouped into two buckets: studies adopting a resource-based view of networking (testing and refining the relationship between networks and resource acquisition), and studies focused on the impact of networking on

startup success (testing and refining the relationship between networking and outcomes of entrepreneurial activity). The research questions specified above take on alternative angles of inquiry into entrepreneurial networking, and can be grouped into two further buckets: 1) motivation for networking, and 2) impact of networking on the entrepreneurial ecosystem. The first group of research questions (RQ Group 1 in Figure 1) can be divided further into questions focused on a) the conscious motivations and b) awareness of risks of networking; the second group (RQ Group 2) can be split into those on a) behaviour of entrepreneurs within networks in terms of collaboration and competition, and b) the relationship between networks and institutionalization of entrepreneurial ecosystems.

1.2. Defining the Mobile Ecosystem

Most definitions of terms used in this study are presented in the third, methodology chapter, however, it is useful to turn our attention now briefly to the term “mobile ecosystem.” The phrase is used in this study to denote a combination of environmental (including institutional) factors and individual actors affecting entrepreneurship in the mobile technology industry in three particular contexts, *from the point of view of mobile entrepreneurs*. Thus, the words “mobile ecosystem” always refer to the “mobile *entrepreneurship* ecosystem,” as opposed to the mobile *industry* ecosystem, where the focus is on established firms and their interaction (see, for instance, Basole, 2009), also sometimes called the mobile *innovation* ecosystem (e.g. Adner, 2006). The idea common to them, that of an ecosystem, is a useful starting point in thinking about the dynamism of the environment for mobile entrepreneurs. Debra Jackson’s (2011)

definition addresses the origin of the word in the natural sciences, and provides a useful distinction of the categories of actors discussed in this study:

[...] a biological ecosystem is a complex set of relationships among the living resources, habitats, and residents of an area, whose functional goal is to maintain an [energy] equilibrium sustaining state. In contrast, an innovation ecosystem models the economic rather than the energy dynamics of the complex relationships that are formed between *actors* or *entities* whose functional goal is to enable technology development and innovation. In this context, the actors would include the material resources (funds, equipment, facilities, etc.) and the human capital (students, faculty, staff, industry researchers, industry representatives, etc.) that make up the institutional entities participating in the ecosystem (e.g. the universities, colleges of engineering, business schools, business firms, venture capitalists (VC), industry-university research institutes, federal or industrial supported Centers of Excellence, and state and/or local economic development and business assistance organizations, funding agencies, policy makers, etc.).

(Jackson, 2011, p.1)

Jackson places these actors into the following categories: government, academia, small business, investors, and industry (2011, p.8).¹ Earlier definitions of ecosystems in innovation and entrepreneurship contexts are less detailed, but can be helpful in pointing out the “complexity and diversity of actors, roles, and environmental factors that interact to determine the entrepreneurial performance of a region or locality” (Spilling, 1996) or the recognition of entrepreneurship as a collective achievement consisting of feedback loops between institutions and individuals: “while this infrastructure facilitates and constrains individual entrepreneurs, it is the latter who construct and change the industrial infrastructure” (Van de Ven, 1993, p. 211).

The word “ecosystem” has also been widely used in the mobile software technology industry by a range of actors (see, for instance, the 2000 speech by Carly

¹ Her assertion that material resources such as funds, equipment and facilities have agency is problematic if it is based on the assumption that inanimate objects have the ability to act willfully; however, she makes no such claim.

Fiorina, CEO of HP, on “The Digital Ecosystem” and the Vakulenko et al. (2011) report on “The Clash of Ecosystems”). The discussion by Basole (2009), whose focus is on “a large and complex network of companies” (p. 144), is useful in considering the complexity of the environments in which mobile industry entrepreneurs operate.

According to Basole (2009),

With the convergence of enabling technologies, the complexity of the mobile ecosystem is increasing multifold as new actors are emerging, new relations are formed, and the traditional distribution of power is shifted.

(P. 144)

Basole goes on to detail the segments of the mobile *industry* ecosystem, describing the intricate and overlapping relationships between mobile network operators, silicon vendors and other component providers, network and infrastructure providers, device manufacturers, cable providers, service and billing providers, internet service providers, content providers, media and entertainment firms, gaming providers, photography and digital imaging providers, platform providers, application and software providers, and system integrators (2009). While Basole’s emphasis on complexity is crucial for understanding the point of view of mobile entrepreneurs (who are the key informants for this study), Basole’s confinement of ecosystem segments to private sector companies omits some key actors, including users, investors, policy makers, and others. A more general set of categories for software ecosystem actors is provided by Messerschmitt and Szyperski (2005), who divide it into users, programmers, managers, industrialists, governments and lawyers, and others, all responsible for orchestrating economic activity. According to them, the production of software must necessarily occur within an ecosystem:

good software cannot be created without a strong connection to all the stakeholders, which includes not only users, but also managers, administrators, operators and others. Taken in its entire context, identifying and analyzing needs through operations and use, creating and managing software is ultimately a highly social activity.

(Messerschmitt & Szyperski, 2003, p. 5)

Thus, Messerschmitt and Szyperski unwittingly combine Jackson's and Basole's definition, while providing some further context relevant to mobile software entrepreneurs. The analyses of the three cases presented in Chapters 4, 5 and 6, are inspired by the three treatments of ecosystems mentioned above. The introductory sections of each of the three case chapters thus discuss a range of the aforementioned ecosystem actors in the context of the mobile software industry and the environment for mobile industry entrepreneurs in each of the countries.

1.3. Why Study Entrepreneurs in the Mobile Technology Industry?

There's an app for that.
(Apple Inc., 2014)

Mobile software is relatively new, and mobile entrepreneurs are operating in a highly dynamic (i.e. rapidly changing), complex and uncertain environment. Further, mobile entrepreneurs regularly engage in networking activities. Thus, they present a rare opportunity for observing networking activities of entrepreneurs at an early stage of an industry's development.

Over a short period of time, wireless networks and mobile devices, including phones and tablets, have reached high penetration rates in many parts of the world, particularly in urban areas (Townsend, 2000). This has inspired entrepreneurs around the world to put mobile technology to use in astounding ways. These innovators are of particular interest to the study of social networks and their role in innovative

entrepreneurship for three reasons: 1) the entrepreneurs' working culture rests on frequent informal and formal exchanges, online and offline (Birley, 1986; Johannisson; 1986), 2) as highly networked individuals, they take initiatives to obtain information and services in ways that reach beyond the boundaries of institutions (Dutton & Eynon, 2009); and 3) their sector – mobile technology - is relatively new, providing an opportunity to study their behaviour in the initial stages of the industry's development.

One of the reasons for the growth of the industry is that mobile phones have shown potential to have profound impact on many aspects of human life, especially in areas where other types of infrastructure (such as roads, railways, or fixed line telephony) are not readily available. The proliferation of mobile networks throughout the world has been impressive in the period 2003-2013, with the penetration rate of mobile devices at 79% in high-income countries. In low- and middle-income countries, the penetration rate was 41% in 2013 (GSMA, 2014a), with an addition 880 million people expected to adopt mobile technologies by 2020 (GSMA, 2014a). Realizing the potential of mobile technologies depends on available infrastructure, including physical networking equipment, telecommunications policy, and regulation of all other sectors (such as banking, healthcare, education, etc.) where mobile applications can be deployed. In rich countries, the legacy infrastructure and policy regimes can serve as an impediment to adoption of innovations made possible by mobile technology. For instance, in Canada, lack of competition beyond three major telecom incumbents has resulted in some of the highest cellular subscription fees in the world (OECD, 2013); and in the United States, demand for mobile banking services has been relatively low, due to the widespread use of credit cards (Hayashi, 2012).

In many markets in Africa, Asia and Latin America, adoption has been positively influenced by trend to liberalization of the telecommunications industry (see Aker & Mbiti, 2010 and Howard & Mazaheri, 2009), which has also increased investment in upgrading physical networks, including mobile towers (Buys et al., 2009). Creative approaches to bypassing remaining gaps (for instance, via opportunistic networks—see Pelusi et al., 2006), and original, local solutions to challenges posed by unreliable electricity supplies (see, for instance, Brady et al. 2008) needed for charging devices. The strongest factor has arguably been demand for mobile applications.

While most citizens of rich countries have access to financial systems as well as the Internet, researchers have documented that the poorest users of mobile phones prioritize acquiring mobile devices and paying for airtime (and, ultimately, the access to information and communication networks they obtain in return) in favour of transportation fees, obtaining new clothing, or even purchasing food (see, for instance, Omwansa et al., 2013 and Chepken & Muhalia, 2010), attesting to the importance of mobile technologies to quality of life. These devices can deliver market information to farmers across great distances, bring health, education and government services remotely to citizens who are unable to reach physical facilities, provide supply and delivery channels to small businesses, and facilitate access to money and financial services. Mobile devices have been used as a platform for exchange of real estate and other property (for example, see Corus Home Realty, 2003); urban planning (Ratti et al., 2006), delivery of various business and public services (Aker & Mbiti, 2010); trades such as construction (Molony, 2008), fishing (Jensen, 2007) and taxi services (Sey, 2011); accessing news and entertainment content (Wei, 2008); wholesale or retail trade,

especially in agricultural products (Aker, 2010); banking and other financial services (Donner, 2008); education (Evans, 2008; Motiwalla, 2007), location-based services, which could include applications in fleet management, location-specific advertising, or personal safety protection (Barnes, 2003), and emergency services (McEvoy et al., 2005) among many others. The list goes on, in seemingly unending fashion, and this astonishing breadth of uses has been captured in the now iconic Apple Inc. advertising slogan: “there’s an app for that,” with the implication that whatever the problem, a mobile app can help to solve it.

The widespread adoption of digital technologies—including mobile Internet and other communications—has created opportunities for entrepreneurs around the world, as has historically been the case with innovative technologies more generally (Drucker, 2006). One of the points of entry into the “digital economy” with the lowest barriers of entry is through development of mobile software, such as apps. The programming skills required can be learned in a short period of time² and the resulting apps distributed at relatively low cost via the same networks on which they run. In recognition of these new economic opportunities, communities of entrepreneurs focused on realizing the potential of digital technologies have emerged in countries around the world (see Appendix A) in recent years, providing a unique opportunity to study the motivations and behaviours of nascent entrepreneurs.

² For instance, eMobilis in Kenya offers a three-month, part-time distance course in mobile software programming, content creation and entrepreneurship skills. See “Mobile Software Development and Entrepreneurship Program” at <http://somasoma.co.ke/courses/678-java-j2me-mobile-software-development-and-entrepreneurship-program-mit>

The following sections will provide an overview of the mobile technology industry, noting in particular its many actors and rapid evolution, and give a brief overview of networking groups in which mobile software entrepreneurs participate, with the aim of describing the opportunities, constraints, choices and dilemmas influencing their behaviour. In particular, section 1.3.1. will illustrate the impact of the global mobile telephony industry, including trends in software (“apps”), hardware (“devices”) and business models; section 1.3.2. will discuss the complexity of the industry environment and of the choices an entrepreneur must make in the process of starting a mobile software business; and section 1.4. will review networks specific to mobile software entrepreneurs, on which they rely as they build their businesses in this relatively young industry. The purpose of these sections is to contextualize the findings relevant to the specific networks in Kathmandu, Nairobi, and London. In particular, the overviews of the short but eventful history of the mobile industry, and of the ongoing rapid pace of change in the relevant technologies and their uses, are aimed at illustrating the intricacies involved in building, testing, launching, marketing, and selling a mobile software application. The implications of entrepreneurial activity in the mobile industry could be especially striking in areas of the world where mobile devices provide the only means of communication and service delivery over a distance, producing significant potential for efficiency gains, and therefore, for entrepreneurial activity (see Donner, 2008); however, as a number of studies have shown, such potential can easily remain unrealized in the absence of a supportive institutional environment, or ecosystem (see Thompson & Garbacz, 2007 for a review). As this study’s results will show, mobile technology entrepreneurs are aware of their dependence on a functional

entrepreneurship ecosystem specific to their industry, and use their networks to create and nurture an environment supportive of their endeavors.

1.3.1. Mobile Communications Technology Industry Background

[If other industries innovated at the same rate as the PC industry], the car would cost about \$27, and the cereal would cost about one cent.

(Bill Gates, 1997)

One of the most notable characteristics of the global computing industry, which today includes handheld devices such as mobile phones, has been the rapid succession and adoption of innovative products and services since its emergence (Giachetti & Marchi, 2010). Considering the industry's history is helpful for understanding just how quick the pace of technological change has been, and, importantly, points to the need for frequent updating of technical skills and business strategies, which can stimulate as well as impede entrepreneurial activity. According to Pleatsikas and Teece (2001),

It is not just immediate entry that tempers behavior in high technology industries; the threat of the next generation of products and services [...] is of concerns to incumbents. Current leaders must succeed in each round of innovation or lose leadership. In such a dynamic environment, high market shares are fragile and may confer little, if any, future advantage. [...] Furthermore, the unpredictability of the timing of such shifts may help to constrain behavior, as current market leaders can never be sure that a shift will not occur tomorrow.

(P. 672)

The “dynamic” nature of mobile telephony has resulted in a number of such shifts. Initially, the potential of mobile phones could be gleaned through the increase in access to voice communication without the need for extensive cables required by traditional telephone landlines (Garbacz & Thompson, 2005; Garbacz & Thompson, 2007). With the addition of data capable devices, mobiles have also been used to “leapfrog” other technologies—including not only telecommunications cables but also roads and postal

delivery networks—by allowing the provision of a range of services and products through mobile apps that would otherwise require costly transportation infrastructure.

The precursor to contemporary hand-held phones appeared in 1973, when Motorola first launched an analog device weighing two kilograms, at a development cost over \$1,000,000 (Anjarwalla, 2010). A decade later, a portable handheld phone could be made for \$4,000, or above \$10,000 in 2008 dollars (Torok and Holper, 2008). As processing power and batteries became smaller and more powerful and efficient, mobiles entered the mainstream, and have kept up with advancements in other technologies. The 1999 introduction of the Blackberry, by the Canadian firm Research in Motion, marked the departure from the singular focus of mobile technology on voice communications. The original Blackberry device was a two-way pager with a keypad and was marketed as “wearable wireless email” (Research in Motion, 1999, p. 2). By 2003, it equipped users with access to multiple email addresses, third-party Java applications and web browsing, in addition to voice capability, encouraging convergence and innovation that combined platforms previously unconnected (Research in Motion, 2003). In 2007, Apple’s iPhone touch-screen technology was introduced, followed by the App Store and its groundbreaking application development business model in 2008.

At the time data for this study was collected, in addition to Apple and BlackBerry devices, Nokia’s devices and its Symbian operating system and Android devices and system also offered a wide range of apps available, either to be downloaded from “app stores” or individual websites, sent by other users or pre-installed by device manufacturers or service providers. Founded in 2003 to develop mobile phone

operating systems, Android, Inc. was purchased by Google in 2005. Responding to demand by programmers for app development model alternatives to Apple's iOS, Google made the Android software open source to encourage development of new mobile services and products (Open Handset Alliance, 2007). This meant that the basic skeleton of the source code was available freely to the developer community around the world, but also that modifications built on top of the skeleton could become proprietary, giving incentive to many new entrants. The first Android handset, called Dream, was launched in October 2008 by the Taiwanese company HTC (Gozalvez, 2008). Google itself has self-branded several Android phones and developed Android Market, a portal for obtaining Android applications. The portal offered more than 400,000 applications with over ten billion downloaded by January 2012 (Paul, 2012). It has subsequently been renamed Google Play, and offered over a million apps as of July 2014 (Number of Apps, 2014). Nokia, which traditionally held a large market share of the simple handset market, especially in the developing world—62% in Africa in 2009, for instance (Tripathy & Virkinew, 2012)—chose not to migrate its smartphone devices to the Android software and failed to capture a large share of this growing market. Instead, in 2011, Nokia forged an agreement with Microsoft and launched Lumia, a smartphone based on the Windows operating system, after deciding to stop investing in Symbian software it had developed in house (Weber, 2011). In only 3 years (2008 – 2011), Symbian's market share dropped from 52% to 17 %, while Android grew from 0.5% to 53% (World Bank, 2012a). The lesson in Nokia's experience is that even an established corporation with adequate resources necessary for market research can fail to anticipate crucial changes in a rapidly evolving industry and quickly lose its market position. The

risk for entrepreneurs, whose fledgling businesses are often under-resources, is likely to be much greater. Figure 2 shows the significant changes in market shares of major mobile operating system platforms from 2008, to only three years later, in 2011.

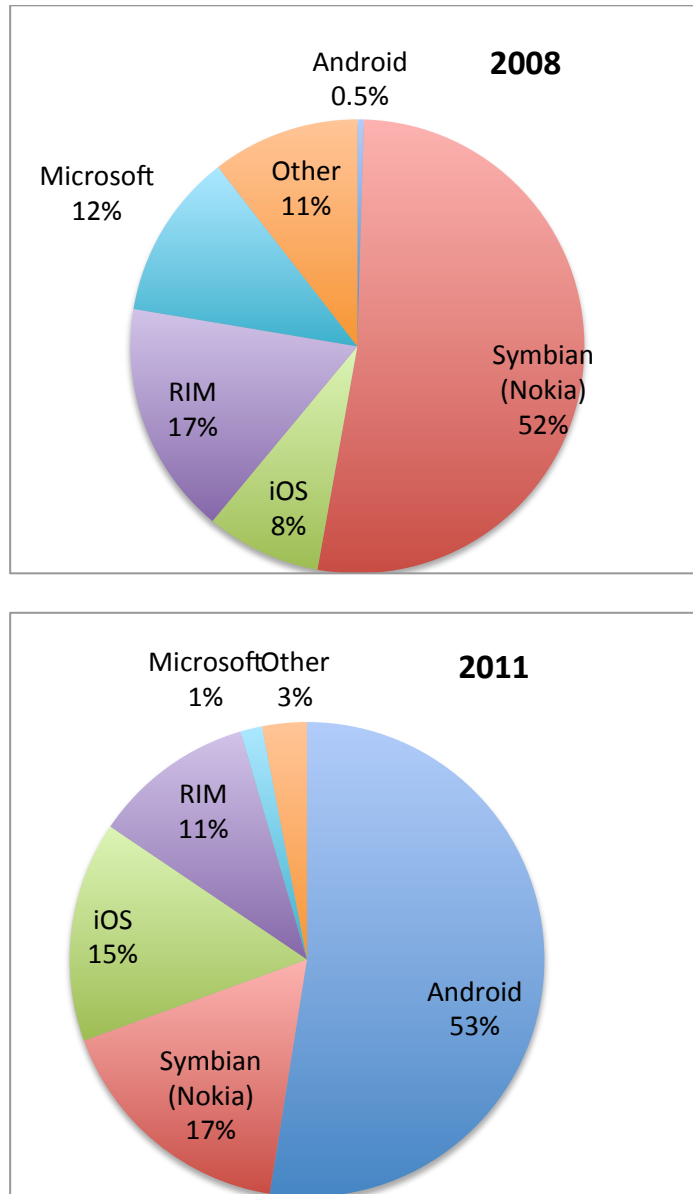


Figure 2: Market Share of Mobile Handset Sales by Operating System, 2008 and 2011 (World Bank, 2012a).

The market share of various operating system platforms has been influenced by the number of mobile apps that can be installed on each of them. Mobile apps are small software programs that allow users to easily access data services, games, news or previously downloaded content and millions of such applications can be downloaded to mobile phones, pointing to the pervasiveness of mobile technologies in our lives.

Most of the early growth in the mobile industry occurred in North America, followed by East Asia and Europe. As mobile connectivity (World Bank, 2012a) and business regulation became more friendly to entrepreneurs (World Bank, 2012b) in emerging markets of Africa, South Asia and Latin America, these countries became well situated to exploit the benefits of mobile communications. The Global System for Mobile (GSM) industry association estimated that 6.4 billion mobile connections were active around the world at the end of 2012 (GSMA, 2012a). Much of the growth at this time was occurring in developing countries, where a growing number of consumers could afford to use mobile handsets for more than just essential voice calls. The trend was helped by improvements in economic welfare: World Bank data show that incomes in low and middle income nations have tripled over the last decade, and that the mobile sector itself has become more significant in developing economies. Mobile industry revenues as a proportion of GDP rose from 0.9% in 2000 to 1.5% in 2010 (World Bank, 2012a), and to 3.6% by 2014 (GSMA, 2014b).

In industrialized and developing countries alike, the emergence of mobile broadband networks coupled with computer-like handsets has caused rapid shifts in the mobile innovation ecosystem, composed of the set of relationships that enable technology development and innovation. One shift relevant to entrepreneurs is the fact

that mobile device users are no longer limited to using services provided by their mobile network operators (i.e. carriers) but can install apps on mobile phones with Wi-Fi capability and use the internet, as opposed to mobile telephony networks, to access all kinds of information, a process referred to as “unbundling” (see Anderson & Williams, 2004). Thus, the user can buy a phone from one company, access mobile telephony networks through another company’ infrastructure, rely on Internet service providers (often mediated by retail outlets of firms in non-communications sectors, such as coffee shops) to connect the device to the Internet, and purchase apps from many more companies for a variety of uses.

1.3.2. The App Revolution

Since their introduction to the public in the 1970s, mobile phones steadily gained in popularity but their functions remained confined to voice communications, and later “short message service” or SMS, involving text delivered over telephone networks. Because mobile network operators carried all traffic, these companies exerted control over the mobile ecosystem (Noam, 2006). The introduction of smartphones allowed users to connect their devices via the wireless Internet, independently of mobile telephone networks and their operators. The smartphone brought computing power to hand-held devices, allowing users to obtain third-party software (mobile apps) from a variety of sources, including but not limited to mobile network operators (Holzer & Ondrus, 2011).

BlackBerry, launched in 1999 by the Canadian company Research in Motion, was the first mobile device to give users access to “wearable email” via the company’s dedicated servers (Research in Motion, 1999, p. 2), effectively making access to data

through a mobile device independent of mobile (telecom) network operators. This was followed by the introduction of operating systems Symbian and Android, in 2002 and 2003 respectively, and eventually by Apple's iOS mobile operating system, launched in 2007, all of whom allowed users to download applications via wifi Internet onto their devices, further extending their usability without involvement of the network operators. (World Bank, 2012a)

In many developing countries, the device manufacturer Nokia dominated markets with early handsets and "feature" (non-smart) phones with limited data processing capability (World Bank, 2012a). In the period between 2002 and 2010, Symbian was shipped in 450 million smartphones, many of them made by Nokia. With the introduction of the Android and iOS platforms, however, Symbian rapidly lost market share. Nokia, which had acquired Symbian in 2008, announced it was abandoning the platform in 2011 (West & Wood, 2011) and transitioned to the Windows platform on its smartphones (World Bank, 2012a).

Many mobile software developers and entrepreneurs in developing countries, guided by the dominance of Nokia featurephone devices, assumed that the Symbian platform would be an important one for the smartphone software markets in their countries. Thus, they invested in developing programming skills for the Symbian operating system; however, the demise of the platform made it necessary for them to quickly adapt to alternative systems. In particular, the Android platform, due to better adaptability for a greater number of devices in comparison to Apple's iOS, has emerged as the most popular system in emerging and frontier markets.

The rapid rise and fall of Symbian is an example of the dynamic nature of the mobile ecosystem. While Android was the market leader in Africa in 2014 (Matuluko, 2014), competitors such as Microsoft, with its Windows platform, continued to invest in emerging markets (O'Brien, 2015). Uncertainty in terms of which operating system(s) will prove to be most widely used, combined the increased separation between mobile devices, software and network operators, makes for a highly complex ecosystem in which mobile entrepreneurs operate.

While apps in developed markets are widely available, consumers in emerging markets still struggle with adoption, primarily because of handset prices and the lack of credit card ownership. While the cost of mobile devices is dropping rapidly, with smartphones like Huawei's IDEOS now available for USD 50, paying for apps with credit cards is still not an option for many. Even in Kenya, which has a relatively high rate of penetration, and where the usage of mobile money is widespread, app purchasing is not always simple: users often need an additional platform, like PesaPal to use M-PESA to pay for mobile apps and services. A related difficulty is faced by app developers, who find it hard to open seller accounts in popular app stores without having a credit card, thus making monetization of apps a challenge. As a result, they frequently lose a significant share of revenues to operators (in cases where operators are willing to bill on behalf of the developer); however, there is evidence that trends in emerging markets are favourable, with penetration numbers growing, and with increased interest in smartphone ownership (Gartner, 2014).

1.3.3. Complexity of the Entrepreneurial Ecosystem in the Mobile Industry

Mobile applications are being developed in all parts of the ecosystem, with very few lines of division of responsibility in the industry and with great variability in the value chain, production process and distribution channels. As a result, all types of industry players can be the owners of profits gained through app development, as well as of any resulting intellectual property, frequently putting normally vertically integrated parts of an industry into direct competition. This “disorderly” product development path is characteristic of industries with a high pace of innovation and uncertainty (Klepper, 1997), which require non-traditional means of information exchange, including through informal networks (Rosa et al., 1999).

Device manufacturers, network operators, content providers, software development firms and individual developers all compete with mobile entrepreneurs in the app development and distribution. There is no “natural” place where applications originate or default method for their distributions: mostly, network operators and device manufacturers provide their own apps, with other apps supplied to market directly by software entrepreneurs via app stores or other channels, as discussed above. To complicate things further, mobile software entrepreneurs face a vast array of choices of platforms and distribution models in the process of bringing their apps to market. For example, most apps for simple, low-end phones are SMS-based, while apps for mid-range devices often rely on mobile Internet access, and may be written in Java or PHP programming languages. Smartphone applications can be written for the proprietary Apple iOS, Blackberry or Windows platforms, or the open source Android, among other options. According to one survey, in 2011, developers used an average of 3.2

platforms concurrently, which was a 15% increase compared to the previous year (Vision Mobile, 2011), a sign of the necessity for developers to hone skills in multiple platforms, since it was unclear which one, or which ones, of these platforms—if any—would become dominant in the future. In other words, developers chose to diversify their skills because the market demanded variety and flexibility. Marketing and distributing apps dilemmas are especially challenging: app stores based on operating systems compete with those managed by handset manufacturers and major global brands, and programmers must decide which store, or stores, will be most effective as a delivery vehicle of apps to their potential customers.

1.4. Social Networks in the Mobile Industry

Rapid innovation and the need for frequent information exchange have been present in the early stages of other high-tech industries (such as the semiconductor industry in the 1970s, the PC software industry in the 1980s and the Internet in the 1990s). Over time, innovators in these industries have developed a culture known for its reliance on sharing information through informal networks (von Hippel, 2005). In this culture, programmers have often gone to each other for support in problem-solving, via online communities and discussion groups as well as through get-togethers, conferences and hackathons. A key aspect of a hackathon, which involves collaborative computer programming, is the coming together of many people to approach problems of their own choosing and with little to no restrictions on direction or goal of the programming. Openness and informality are also important for the programmer culture; for instance, meetings of the Internet Engineering Task Force, the standard setting body for the Internet, are accessible to anyone, with its proceedings and decision making

procedures—based on “rough consensus”—largely conducted over email, and entirely public.

Software entrepreneurs, many of whom are also programmers, also appear to be approaching business problems together through networks, consisting of acquaintances, mentors, investors as well as peers, i.e. other mobile innovators. Some such networks have become formal and have spread around the world in recent years. They serve three distinct purposes in the development of new ventures: the discovery of opportunities, securing new resources and obtaining of legitimacy, all of which are necessary for the survival of a new venture (Elfring & Hulsink, 2003). Entrepreneurs may have initiative, an appetite for risk, creative ideas and some competence to run their business, but they often need complementary resources to produce and deliver their goods or services. Social networks are important sources of support and knowledge, and can provide access to distribution channels, capital, skills, and labour to start new business activities (Teece, 1986).

An early example of social networking activities in the mobile industry is Mobile Monday, an “open community platform of mobile entrepreneurs, developers, investors and industry enthusiasts,” with the goal to create “business opportunities through live networking event.” (Mobile Monday, 2012). It provides a space for entrepreneurs to demonstrate new products, share ideas and discuss trends from both local and global markets. Founded in 2000, in Helsinki, Finland, the community has grown to over 100 city chapters and is managed by 300 volunteers around the world. More narrowly focused organizations, such as Google Technology User Groups (see www.gtugs.org), cater to participants interested in a particular developer technology. In

addition to networking, these groups provide training opportunities for developers using the open Android mobile platform, code.google.com. GTUGs vary in format from a dozen people who may get together to watch a corporate video, to large gatherings with demos and lectures, with events like code sprints and hackathons. Smaller, local networks have also been formed in many cities. For instance, Nairobi-based AkiraChix and Toronto-based Ladies Learning Code provide networking events and training in casual settings for women and girls unfamiliar with developer technology. These cultivate the careers of young software entrepreneurs of both genders by providing training in programming, mobile application design and business skills. In Nepal, Young Innovations, the group behind the Kathmandu-based organization Mobile Nepal, regularly hosts informal evening gathering, hackathons, and “bar camps” – open conferences where entrepreneurs and developers give presentations and provide feedback (MobileNepal, 2013), in addition to providing online spaces for interaction of its members (see website screenshot below).



Figure 3: MobileNepal.net Website (Captured October 10, 2013)

In London, there are hundreds of networking groups of different sizes, formats and histories, but they share their roots in the need of technology entrepreneurs to come together in low-risk, informal situations, and share their knowledge (as of October, 2014, the London section of the MeetUp.com website listed over 250 such groups).

1.5. Potential Contribution

It is still too early to say whether the entrepreneurial economy will remain primarily an American phenomenon or whether it will emerge in other

industrially developed countries. [...] If, as is quite likely, demographics has been a factor in the emergence of the entrepreneurial economy in the United States, we could well see a similar development in Europe by 1990 or 1995. But this is speculation. So far, the entrepreneurial economy is purely an American phenomenon.

(Peter Drucker, 1985, in Drucker, 2006, p.8)

The evolution of the mobile industry is occurring amidst rapid globalization, and benefits from, as much as it contributes to, the growth in connections between individuals, groups, organizations, businesses, and states in all parts of the world. This project adds to what we know about innovation in the mobile technology industry, by studying the behavior of the very people driving the innovation process: software entrepreneurs. In particular, it considers the reliance of these innovators on their social networks, composed of their families, friends, peers, mentors, rivals, investors, customers and companies in what is referred to in the industry as the “mobile ecosystem.”

The above quote by Peter Drucker seems very dated today; however, as this study’s results will show, the American model of technology entrepreneurship, embodied by the Silicon Valley archetype, persists as a global ideal. With emergence of international communications networks, including the Internet, the GSM standard, and other protocols used for transfer of data, and the proliferation of mobile technologies around the world, the Silicon Valley model of technology entrepreneurship is being emulated in very different parts of the world, including (as we will see in more detail) in Kathmandu, Nairobi, and London. The results of the study show that the role of networking in this emulation process is very important, but also that the motivation of entrepreneurs is not necessarily to recreate a replica of Silicon Valley. Rather, their aim is to obtain support and knowledge needed for their endeavors from their own

environments, by learning from, and referencing Silicon Valley practices and institutions. Thus, the primary contribution of the thesis is related to the role of networks in legitimizing new types of economic activity, whether the novelty lie in the method or subject: in this case, the practice of entrepreneurship or the development of the mobile technology industry in environments where one or both are not adequately supported.

1.6. Thesis Structure

This chapter has introduced the theoretical concepts of entrepreneurship and networking, pointed to a gap in literature that this study aims to narrow (further discussed in Chapter 2) and noted the relevance of this research to policy makers. The chapter has also described the state of the global mobile telephony industry, emphasizing the rapid pace of change and complexity that affect entrepreneurs in the sector, and has given a brief overview of networking practices. The research questions that guided the research are stated in section 1.1. The second chapter provides a survey and critical assessment of existing literature on entrepreneurship and networks on which this project aims to build. The third chapter, on research design, describes the process of designing and conducting focus groups, interviews and participant observation, provides a rationale for sampling techniques used, discusses data analysis methodologies employed and considers the validity and reliability of data collected. It also gives the reasoning behind the qualitative analytical approach to answering research questions.

The fourth, fifth and sixth chapters present results from each of the three city-

based cases: Kathmandu, Nairobi and London. Their structure approximately corresponds to the research questions in section 1.1, while allowing for presentation of unanticipated findings. Differences and similarities in results found in the three cases are discussed in Chapter 7, which also presents the emerging themes appearing in all three. A potential theoretical contribution and implications for policy makers and practitioners are articulated in Chapter 8. Finally, a conclusion reflects on the research questions and results, reiterates the connections between this particular study and its theoretical foundations, and provides suggestions for further research and policy development.

2. Literature Review

Literature on entrepreneurial networks draws from three, relatively young academic fields: entrepreneurship studies, innovation studies and science, technology and society studies (Fagerberg et al., 2012). Although the subject areas of each of these three fields overlap considerably, and each has considered entrepreneurial networks, the respective academic communities remain somewhat disconnected (Bhupatiraju et al., 2012). This chapter focuses on key concepts from entrepreneurship literature, while also making several connections to innovation theories relevant to this study.

2.1. The Study of Entrepreneurship and Entrepreneurial Networks

In literature and in popular media, most inquiries into entrepreneurship have their roots in economics. These origins are reflected in the dominance of perspectives resting on economic concepts: cost-benefit analysis, opportunity cost, economic systems and institutions, equilibria, factors of production (or resources, as they are known in networks literature discussed below), property rights, technology, and so on. In addition to economic perspectives, entrepreneurship and innovation scholars have integrated into their work concepts from other disciplines such as sociology and psychology. The following sections discuss contributions of entrepreneurship and innovation literatures directly relevant to entrepreneurial networks.

2.1.1. Origins of the concept: Cantillon, Schumpeter, and Shackle

Richard Cantillon, an 18th century economist, is thought to have been among the first to use the word entrepreneur in its modern meaning in his 1733 *Essay (Essai sur la Nature*

du Commerce en Général). He rested the foundation of his economic theory on the entrepreneur (Brown & Thornton, 2013), that is to say he viewed the entrepreneur as a vehicle of all commerce, the actor who executed on arbitrage opportunities in an economy by incurring known costs and reaping uncertain returns (Hébert, 1985). The title of one of the sections of his Essay shows that he held entrepreneurship as a fundamental economic factor: “The Circulation and Exchange of Goods and Merchandise as well as their Production are carried on in Europe by Entrepreneurs, and at a risk (Cantillon, 2011 p. 17).” According to Cantillon, the main characteristic that distinguishes an entrepreneur from other economic actors is the uncertainty of returns, which workers on wages do not experience. In insisting on this narrow difference, he allows for the definition of entrepreneurs to include various kinds of people, regardless of their social rank or level of chosen field (Cantillon, 2011). This understanding allows us to consider innovators as entrepreneurs even before their innovations are adopted by the market. In Cantillon’s words:

The entrepreneurs are on unfixed wages while the others [hired workers] are on fixed wages as long as there is work, although their functions and ranks may be very unequal. The general who has his pay, the courtier his pension and the domestic servant who has wages, all fall into this last class. *All the others are entrepreneurs, whether they are set up with capital to conduct their enterprise, or are entrepreneurs of their own labor without capital, and they may be regarded as living under uncertainty; even the beggars and the robbers are entrepreneurs of this class.*

(Cantillon, 2011; original work published 1755, emphasis added)

The dominant starting point and a continued source of inspiration for and influence on contemporary entrepreneurship scholars is not Cantillon, however, but Joseph Schumpeter, also widely considered the “father” of innovation studies (Audretsch, 2003; Landström et al., 2012). Rather than focusing on the entrepreneur’s role as a risk-

bearing transaction facilitator described by Cantillon and others, Schumpeter, at least in his early writings, focused on the *capacity* of the entrepreneur to overcome economic inertia and the related entrepreneurial quest for innovation. Schumpeter's entrepreneur opposes the environmental *status quo* and, thus, has disruptive or disequilibrating effects (Audretsch, 2003). This disruption or disequilibrium, Schumpeter contends, is necessary to further development of economic potential of which others were not aware. Thus, Schumpeter's entrepreneur creates a new space for growth in which a new equilibrium may be achieved, and disrupted again later on (Schumpeter, 1934). Schumpeter is also credited with recognition of the creative potential of entrepreneurs and with identifying the concept of entrepreneurial spirit ("Unternehmergeist") to describe the special, entrepreneurial mindset, although he famously considered this mindset to result in what he termed "creative destruction" (Schumpeter, 1942).

Schumpeter considered the process of innovation as the recombination of parts of existing resources and systems in novel ways, or even the reconceptualization of the system itself: "To produce means to combine materials and forces within our reach. [...] To produce other things [...] means to combine these materials and forces differently" (Schumpeter, 1934, p. 65). He also made the explicit link between innovation, competitive advantage and economic growth, and pointed to innovation as a priority of any individual or body seeking to advance their economic position:

In a competitive economy [...], new combinations mean the competitive elimination of the old; [the recombination] explains on the one hand the process by which individuals and families rise and fall economically and socially, and which is peculiar to [capitalist] form of organization, as well as a whole series of other phenomena of the business cycle, of the mechanism of the formation of [...] fortunes, and so on. [...] If the competitive economy is broken up by the growth of great combines, as is increasingly the case to-day in all countries, then this must become in ever greater measure the internal concern of one and the

same economic body.

(Schumpeter, 1934, p. 66.)

Schumpeter's essay "The theory of economic development" (1934) discussed the interaction between innovative individuals, i.e. entrepreneurs, and their social surroundings, while in his later book, *Capitalism, Socialism, and Democracy*, he advanced his idea of innovation as "creative destruction" of a previously existing economic order (1942). Schumpeter wrote that innovation is the critical dimension of change: as innovations emerge, temporary monopolies that allow abnormal profits appear before they are faced with competition by rivals and imitators and destroyed. The disruptive events create new markets, products and services that, over the medium term, improve economic gains.

Thus, Schumpeter requires proof of viability before recognizing activity as innovative entrepreneurship, in contrast to Cantillon, who allows for the consideration of nascent entrepreneurs who have no such proof. Since two of the mobile ecosystems considered in this study are in early stages of development, and certainly in stages before abnormal profits can be realized, Cantillon's understanding is a better fit for the analysis focused on nascent entrepreneurs.

Hébert and Link (1989) identify three branches of entrepreneurship scholarship, all belonging to the wider economics traditions, and all stemming from Cantillon: the German school, advanced by Thiinen and Schumpeter; the Austrian school, stemming from Mises, Kirzner, and to an extent, G.S. Schackle, introduced below; and the Chicago school, rooted in Knight and Shultz. Herbert and Link assert that differences between these schools are minor and that the three traditions all accept the "equilibrium paradigm" of entrepreneurship and mostly vary in their interpretation of the

entrepreneur's function as a disequilibrating or equilibrating force (Audretsch, 2003). The exception is Shackle, who rejected the equilibrium paradigm (Hébert & Link, 1989), while supporting the breadth of Cantillon's definition, even two centuries later. Shackle holds that entrepreneurs rely on their imagination, in addition to reason, in pursuit of highly uncertain outcomes:

Enterprise is conduct by which a man deliberately forgoes the assurance that some particularly bad thing will not happen, in order to escape the certainty that some particular good thing will not happen.
(Shackle, 1973, p. 63 in Batstone & Pheby, 1996)

Shackle's legacy is a contentious topic among economists (see, for instance, Brady, 2013) due in part to his criticism of some of the foundational theories of modern economics. A complete and nuanced discussion of Shackle's work is outside of the scope of this study; however, Shackle's focus away from economic equilibria is useful to the analysis in this study, particularly in the case of Kathmandu, where as we will see, entrepreneurship seems to have arisen due to a global opportunity despite a closed national economy whose various points of equilibria under free market conditions change so rapidly they are arguably impossible to determine. His wider interpretation of entrepreneurship is also liberating in the sense of encouraging us to consider the entrepreneur in a more holistic way, as a human being whose biases influence his decisions, rather than the rational economic actor underlying other understandings of the entrepreneur. Shackle writes of entrepreneurship as one of a number of creative domains of human endeavor, dependent on (subjective) interpretation:

All perception is no doubt an act of interpretation, of finding in, or injecting into sense impressions a meaning, the collating with them of numberless memories of experience, the seeing in them of possibilities. This is in its own degree an act of origination. This same activity of thought, but at an enormously enriched,

intensified and out-ranging degree, is what marks the creative writer, composer or theoretician, and it is what marks the entrepreneur.

(Shackle in Hébert & Link, 1989, p. 39.)

In this near-lyrical description, Shackle seems to place the entrepreneur away from the context of Schumpeter's "creative destruction" and into that of creative sense-making. It would not take a great leap from Shackle's definition to describe an entrepreneur as someone who might make a new technology useful and understood in a given societal context, where it was previously unknown or even rejected. Such an understanding seems to fit the Nairobi, Kathmandu and London entrepreneurs, who are all adapting and interpreting mobile technology for local and global markets.

2.2. Entrepreneurship as an Evolving Field of Research

The scholarly emphasis on entrepreneurs has arisen along with the prominence of new computer software and hardware technologies and the entrepreneurs interpreting them. Shane and Venkatraman (2000) drew attention to this increased interest in the field and attempted to renew the relevance of the entrepreneurship research agenda. They considered established equilibrium models of entrepreneurship to be valuable but "necessarily incomplete," and noted that the field has suffered from a lack of agreed-upon definitions of the most basic concepts, including those of the entrepreneur and entrepreneurship. They identified the central problem in defining entrepreneurship to be its dependence on two phenomena: the presence of lucrative opportunities and the abilities of individuals to take advantage of them. Shane and Venkatraman (2000) provided two particularly useful observations for this study. First, noting the high

estimates of entrepreneurial behavior in the population, from 20 percent to over 50 percent depending on the source, they wrote:

Since a large and diverse group of people engage in the transitory process of entrepreneurship, it is improbable that entrepreneurship can be explained *solely* by reference to a characteristic of certain people independent of the situations in which they find themselves.

(Shane & Venkataraman, 2000, p. 218)

Given the diversity of individuals interviewed for this study, it would be difficult to accept as an assumption that a single innate trait, let alone a constant set of characteristics, somehow unites them while excluding others.

Second, Shane and Venkataraman clarified that entrepreneurship does not require, but can include, the creation of new organizations. While they used this conclusion to discuss entrepreneurship within existing organizations, their view is useful to this study because it allows for inclusion of entrepreneurs who launch products into the market—such as mobile apps—without necessarily establishing a firm or working within the confines of a larger entity. In fact, as explained in detail in chapters four through six, data collected for this study came from enterprising individuals who were not necessarily (yet) operating a business: in some cases, they had developed and sold a mobile application without leaving full-time employment. In other words, it would seem that the presence of entrepreneurial activity precedes creation of new firms, especially in the early days of an industry's development. Finally, Shane and Venkataraman singled out information, informational sources and informational corridors as central concepts within their framework, a feature that seems particularly useful for the study of entrepreneurial networks through which information flows as a type of resource. Thus, this study follows Shane and Venkataraman (2000)'s definition

of entrepreneurship research, presented in their influential article, *The Promise of Entrepreneurship as a Field of Research*. According to them, the study of entrepreneurship is:

[...] the scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited (Venkataraman, 1997). Consequently, the field involves the study of *sources* of opportunities, the *processes* of discovery, evaluation and exploitation of opportunities; and the set of *individuals* who discover, evaluate and exploit them.

(Shane & Venkataraman, 2000, p. 218, emphasis in original)

The above definition has been widely adopted and is considered by some to be the “consensus definition” (Aldrich & Cliff, 2003 in Shane, 2012, p. 12). Over a decade later, Venkataraman et al. (2012) revisited the 2000 “Promise” framework to expand it along Herbert Simon’s concept of “the sciences of the artificial” (Simon, 1969). This means that they proposed studying entrepreneurship not as a given process that solely can be observed and understood, but as something to be designed (Venkataraman et al., 2012), and as such, something that has a normative quality. While an extensive debate on “the sciences of the artificial” is far outside the scope of this thesis, the notion that entrepreneurship theory (and practice) may include normative elements may prove particularly useful in contexts where entrepreneurship in the high technology sector is a relatively new phenomenon being promoted by policy-makers (see, for instance, Nailab Raises over 5 Million, 2014).

Landström et al. (2012) acknowledge the Venkataraman et al. framework in their summary of developments in the evolving field of entrepreneurship research. They trace its path from its beginnings as a collection of sub-fields of established disciplines of economics, economic history, psychology and sociology, through advancements

chiefly by management scholars, and to a “search for maturity” phase in which we are now (Landström et al., 2012, p. 1156). While declaring such a young, multidisciplinary field anywhere near maturity seems questionable, the progression they describe seems to indicate a trend towards increased integration of perspectives within the field over time. Landström et al. (2012) distinguish between theoretical foundation works, domain defining works and empirical studies. Under theoretical foundation works, they also find three foci: one, the function of entrepreneurship in market creation (where they situate the above-mentioned German, Austrian and Chicago traditions); two, characteristics of entrepreneurial individuals; and three, the entrepreneurial process. This study is concerned primarily with the process of entrepreneurship, with a secondary relevance to its role in market formation. The following pages highlight a number of concepts under those two umbrellas that are of particular relevance to the analysis.

2.3. Environmental Perspectives

An important question arises for any comparative study of entrepreneurs in different contexts: do some environments, whether due to their economic characteristics, political systems, cultures, geographic locations or other features, have an edge over others in their ability to give rise to entrepreneurial ventures? The question has been addressed from a number of perspectives (Audretsch & Keilbach, 2008; Cuervo, 2005).

In terms of economic variables, studies have covered the relevance of market sizes (Matsuyama, 1992; Di Addario & Vuri, 2010), market orientation (Bhuiyan et al.,

2005; Atuahene-Gima & Ko, 2001; Hult & Ketchen, 2001) industry development stages (Lumpkin & Dess, 2001; Low & Abrahamson, 1997), economic stability (McMilland & Woodruff, 2003; Audretsch & Thurik, 2004; Johnson & Halter, 1995), and factors of production such as natural resources, human and technological capital (Bravo-Ortega & Gregorio, 2005; de Ferranti et al., 2002;). Country-based studies on the relationship between economic infrastructure and new firm formation have been conducted in the US, Britain, Germany, Italy, Japan and Sweden, among many others (Davidsson, 1995 and Reynolds et al., 1994). Results of such studies have been mixed. For instance, Reynolds and Storey, in their study of cross-national variation in the rates of business start-ups, found growth in demand and an urban environment to be factors encouraging entrepreneurship, but concluded that unemployment rates or a liberal economic climate were not necessarily important conditions (Reynolds & Storey, 1993). Klapper et al. (2006) found that “entry regulation,” in particular onerous firm registration policy was a significant barrier to entrepreneurship in European countries, and particularly pronounced in industries that would otherwise have low barriers to entry, such as mobile software. Others have considered the impact of the traditional economic factors of growth, finding the availability of VC capital (Florida & Kenney, 1988; Samila & Sorenson, 2011; Keuschnigg & Nielsen, 2003), other types of financing (Berger & Udell, 1988; Denis, 2004; Sorheim, 2005), government support (Audretsch, 2005; Rasmussen, 2008; Minniti, 2008) and labor (e.g. Solow, 1956), to be key variables. Yet others have found knowledge, and in particular, conditions favourable to knowledge spillovers, to be the most important factors (Romer, 1986; Grossman & Helpman, 1991; Acs et al., 2009). Audretsch and Keilbach (2008) have proposed the notion of

“entrepreneurship capital” as a unique feature of an environment conducive to innovation, in addition to labour, financing and knowledge; however, they define the concept in terms of new business startups, which seems to offer little insight into the entrepreneurial process, since business startups are but one step of entrepreneurial activity, and not an essential one at that.

Silicon Valley, along with other well-known innovative environments, has been the subject of a number of regional and cluster-based analyses, which have produced rich insight into dynamics of entrepreneurial ecosystems. Saxenian (1994) and Thornton and Flynn (2003) find that the area benefits from a combination of established institutions and networks that allow for exchange of resources between them, along with access to labour and technology (Cuervo, 2005). According to Saxenian,

It is not simply the concentration of skilled labor, suppliers and information that distinguishes the region. A variety of regional institutions--including Stanford University, several trade associations and local business organisations, and a myriad of specialised consulting, market research, public relations and venture capital firms--provide technical, financial, and networking services which the region's enterprises often cannot afford individually. [...] These networks defy sectoral barriers: individuals move easily from semiconductor to disk drive firms or from computer to network makers. They move from established firms to start-ups (or vice versa) and even to market research or consulting firms, and from consulting firms back into start-ups. And they continue to meet at trade shows, industry conferences, and the scores of seminars, talks, and social activities organized by local business organisations and trade associations. Moreover, these forums help to reproduce the “sense of community” which distinguishes the region. A shared commitment to advancing technology—derived originally from the common formative and professional experiences of engineers in the region—transcends inter-firm rivalries. [...] This decentralized and fluid environment also promotes the diffusion of intangible technological capabilities and understandings.

(Saxenian, 1990, p. 96-97)

It is worth turning briefly to themes of geographic clusters and regional innovation,

before considering past studies on the roles of networks in entrepreneurship outside of Silicon Valley.

2.4. Geographic Clusters and Regional Innovation Studies

The phenomenon of geographic clustering of innovative activity has been a topic of interest for economists and other innovation and entrepreneurship researchers for decades, dating back to work by Marshall (1920), who found that pooled specialized labour markets are beneficial to innovating firms (Audretsch & Fritsch, 1994). More recently, Michael Porter's perspective on clusters (1998) renewed interest in the subject among policy-makers and across disciplines. The basic premise of theories advocating geographic clustering as a strategy to support innovation is that some crucial inputs for innovation, namely knowledge, skilled labour and institutional landscape are often present in particular regions and difficult to transport elsewhere. The pro-clustering arguments are tempered by Krugman's more nuanced treatment of forces that encourage innovation (1991); Krugman showed that some forces actively discourage clustering, or are centrifugal, as opposed to the pro-clustering, centripetal forces. For instance, immobile resources like land and natural resources, and on a global scale, labour availability, tend to disperse rather than concentrate production; markets, too, tend to cover large areas, resulting in customers near and far from any particular cluster. Krugman concludes that real world behavior and the decision on whether or not to cluster will depend on the interplay of centripetal and centrifugal forces, suggesting that solely considering geographic proximity as a driver of innovation does not tell the entire story (1991).

Still, policy support for clusters of small and medium-sized enterprises in high-technology sectors remains popular (Martin et al., 2011; Cooke, 2002; Porter, 2000), in part due to the successful cases found in the United States (e.g. Silicon Valley, and the Research triangle) as well as Europe (e.g. Baden-Wuerttemberg and Cambridge) and elsewhere. Policy makers from many other regions have tried to replicate similar results by establishing tech cities, science parks and innovation hubs. Academic research has tended to follow and inform these policy efforts, and a number of important research directions have emerged. One track follows Jaffe's work on knowledge spillovers, focusing on efficiency of knowledge exchange between actors who are located close together (1989). This line of inquiry is pertinent to the analysis of informal networks of entrepreneurs, due to its attention on knowledge transmission through interpersonal contacts and labour mobility, both of which are easier in a single location and within a single culture. Feldman and Audretsch (1999) show that spatial clustering varies according to the phase of an industry's development, and the importance of tacit knowledge at any given point of time for a particular industry. Other tracks compare companies in clusters to those outside, seeking to describe their differences and examine any correlations with innovation. Findings by Storper and Harrison (1991), Malmberg and Maskell (1999) and others reinforce conclusions that clusters in high technology industries overall reduce the costs and uncertainties facing a company seeking to develop innovations.

What is common to all of these analyses is the notion that networking is one of the reasons clusters form in the first place, and that networked learning and collaboration, among competitors as well as between firms and customers, partners and

investors, are key factors for innovation. According to Breschi and Malerba,

the possibility for individual firms to tap into the body of localized knowledge and capabilities depends in a fundamental way on the ability to establish and maintain effective social links and lines of communication. [...] Interactions, formal and informal relations [...] are the key mechanisms through which external economies benefit local firms and are ultimately responsible for the emergence, growth, and success of a cluster of innovative firms.

(2001, p. 5)

Whittington et al. (2009) note that literature on regional clustering, for instance in the key US innovation regions of Boston, San Diego and the San Francisco Bay Area, supports the conclusion that factors accounting for innovative returns to location are relational, not geographic. Whittington et al.'s finding most important to this study is that the role of physical location in innovation cannot be understood without an analysis of social structures. Moreover, their results suggest that social relations are more important for innovation than geographic ones.

Breschi and Malerba (2001) pointed out that a key explanatory factor for the emergence of geographic clusters of innovative firms is the concept of knowledge spillovers, also advanced by Audretsch and Feldman (2004), among others. Despite easier transfer of information via information and communication technologies, geographic proximity, often coupled with consistency in cultural norms that govern communication, seems to offer efficiencies that cannot be explained simply by the reduction of distance. Breschi and Malerba (2001) summarized the key approaches to understanding geographic clustering of innovation, including work on technological districts and new industrial spaces, the notion of innovative milieu, regional innovation systems, the French school on *proximité*, localized learning capabilities, and the many case studies of high-technology clusters such as Silicon Valley. They pointed to a

number of important conclusions and unanswered questions about the role of geography in innovation resulting from a wide variety of studies and policy experiments in the last two decades of the twentieth century. Specifically, they noted that embeddedness in networks, and learning through networking are important reasons firms form clusters; networks allow for interfirm collaboration and mobility of labour, and spin-off of new firms from existing institutions, by “supporting common norms, conventions and codes for exchanging and interpreting knowledge” (Breschi & Malerba, 2001, p. 820). At least two other factors are found by Breschi and Malerba to be of importance to clusters: one, availability and mobility of skilled labour, and two, external linkages allowing cluster members to acquire new knowledge, skills, contacts and capital. Finally, Breschi and Malerba point to a number of studies that show that top-down policy efforts to create new clusters are largely ineffective and call for government support for education and support infrastructures instead.

A number of empirical studies have failed to support the assumption that firms in clusters benefit from access to networks that allow knowledge spillovers. In a survey of the R&D workers in IT companies in Cambridge, UK, Huber (2012) finds that over two-thirds did not consider themselves to be benefiting from being part of a successful IT cluster. According to Huber, these highly skilled and specialized workers felt no need to interact with other local firms, universities or other institutions, relying instead on internal company resources and the Internet. Based on his results and other studies (e.g. Moodysson’s 2008 investigation of collaboration in among biotechnology firms), Huber (2012) concludes that any benefits from clustering do not occur spontaneously or merely due to geographic proximity. Further, Baptista and Swann (1998) find that

clusters can have net negative effects on firms. They claim that clusters can encourage homogeneity of labour, which can support innovative activity but also produce unintended congestion effects (making available too much of the same type of skills), with the potential to outweigh any benefits of specialization. Despite this, the cluster-based approach to thinking about the innovation process has contributed to many policy initiatives such as national innovation strategies or national and regional systems of innovation (Lundvall 1992, Braczyk et al., 1998).

Regional innovation scholars, whose interests are related to, but wider than the topic of clusters, have attempted to address some of the shortcomings of clusters literature. Asheim et al. (2011) made a clear distinction between regional innovation studies and clusters literature, championed by Porter (1990, 1998) and others (Baptista & Swann, 1998; Asheim & Coenen, 2005; Cooke, 2001). They supported Martin and Sunley's (2003) argument that the popularity of the clusters approach rests on its promise to policy makers of creating a competitive advantage at the "regional, state and city level" (Porter, 1998, p. xxi, in Asheim et al., 2001). The problem with a cluster approach, according to them, is its reliance on inter-firm, or market-based relationships and networks and failure to incorporate non-market relationships and networks, and other environmental factors (Asheim et al., 2001).

Regional innovation literature recognizes the importance of geography, but embraces complex system theory techniques where knowledge is central to the system but influenced by other key factors. These include research and development capacity, knowledge and technology systems of transfer, formal and informal education training,

the availability of skilled labour, and others others, along with policies that could be used to promote compounding effects among them (Asheim & Gertler, 2005).

Regardless of some of the limitations of analyses focused on the proximity of actors in an entrepreneurship ecosystem, knowledge, knowledge spillovers, as well as networks, persist as central concepts to understanding the entrepreneurial process.

2.5. Entrepreneurial Networks

Networks allow actors with differing levels of knowledge, ability and focus to participate in exchanges which may lead to cooperation, competition, or some combination of the two, and which may be formal or informal in nature as well as market-oriented or focused on another sphere of human activity (Malerba, 2007). Studies of entrepreneurial networking rest on the idea that such interaction affects behavior of entrepreneurs and success of firms (Elfring & Hulsink, 2003; Klyver and Hindle, 2007), an assumption related to notions of social embeddedness of economic actors, including entrepreneurs as well as others (Granovetter, 1976 and 1985; Adrich & Zimmer, 1986). Further, entrepreneurs are thought to derive value from their networks as a result of possessing social capital—the ability to use social ties to useful ends, i.e. to realize brokerage opportunities offered by a social network (Granovetter, 1985; Burt, 2005). In an effort to better understand the relationship between social networks and entrepreneurship, researchers have studied network types (Birley, 1985, Aldrich and Zimmer, 1986), structures (Burt, 2000; Klyver et al., 2008) and characteristics of ties between network members, or nodes (Burt, 2000; Rowley et al., 2000). Some have focused on entrepreneurial networks in specific industries (Elfring & Hulsink, 2003;

Roijakkers, N., & Hagedoorn, 2006; Snow et al., 1993; Broekel & Boschma, 2012; Almeida & Kogut, 1997) or in particular countries (for Sri Lanka, see Premaratne, 2001; for Argentina, see Kantis et al., 2002; for Norway, Sweden and the USA, see Greve & Salaff, 2003; for Germany, see Witt et al., 2008; and for a cross-national comparison, see Kwon & Arenius, 2010). A point of general agreement among entrepreneurship scholars is that entrepreneurs engage in networking in order to acquire resources for their ventures. This section describes a number of efforts to further understand the process by which networks are useful for resource acquisition. It should be noted, however, that the assumption that resource acquisition is the only, or even the strongest, motivation for entrepreneurs seems to remain entirely untested.

2.5.1. Networks and Resource Acquisition

A significant body of literature has developed around the resource acquisition potential of entrepreneurial networks (Aldrich & Zimmer, 1986; Jenssen, 2001; Elfring & Hulsink, 2003; Greve and Salaff, 2003). According to this stream of research, relationships between individual entrepreneurs, their ventures, and other organizations are the vehicles, or means, for identifying and obtaining or exchanging resources located in different parts of the network (Hoang & Antoncic, 2003, p. 166). Resources typically discussed include a wide range of inputs into a business, such as information, advice, finance, skills, and labour (Foss, 1994; Jenssen & Greve 2002). A number of frameworks have been developed to help explain how entrepreneurs go about obtaining these important resources through their social networks and in particular how they use different types of social ties within a network. Granovetter (1983) pointed out that weak

ties (for example, with acquaintances) can serve an important purpose by diversifying the resource base of entrepreneurs. Others, including Aldrich and Zimmer (1986) noted that stronger social ties to resource providers (who are, for example, family members) facilitate the acquisition of resources and enhance the probability of opportunity exploitation (Aldrich & Zimmer, 1986). A number of other scholars have brought the two types of ties together in explaining how the closing of structural holes (located between weaker connections among closely connected groups in a network) can help realize the value within networks (e.g. Burt, 1992 and 2000). Introducing the concept of *tertius iungens* (“third who joins”), Obstfeld (2005) describes the bridging of holes in social structures via third parties who connect otherwise unrelated individuals, organizations and concepts, thus allowing for the (re)combinatorial activity necessary for innovation identified by Schumpeter. Obstfeld also distinguishes between the “idea problem” and the “action problem,” suggesting that a network rich in weak ties may be useful for generating novel ideas but that its strong ties are needed for implementation (Obstfeld, 2005; Tiwana, 2008).

2.5.2. Networks and Subjective Variables: Legitimacy and Self-Efficacy

Entrepreneurs need more than tangible resources like financing, labour and specific knowledge to start and run a business. In addition, psychological variables concern both an individual’s self-perception and also the way she or he is perceived by a given social environment. For instance, Arenius and Minniti (2005) have shown that nascent entrepreneurs rely significantly on subjective and often biased perceptions rather than on objective expectations of success and have called for perceptual variables to be

included in economic models of entrepreneurial behavior. These include legitimacy and self-efficacy, among others. Legitimacy is important for overcoming the liability of newness (Stinchcombe, 1965; Freeman et al., 1983; Aldrich, 1999). A venture is deemed legitimate when it is accepted as a given in its social and organizational environment (Aldrich, 1999). Acceptance is especially difficult to achieve for pioneering entrepreneurs (non-copycats) entering new populations (Aldrich, 1999). Legitimacy building is complex process and occurs in many ways (O'Connor, 2004), including contests and rankings (Rao, 2001), but also through “claim making” through founders’ speech and interactions (O'Connor, 2004).

Self-efficacy is the belief in one’s ability to produce given levels of attainment, in contrast to the more general notion of confidence (Bandura, 1993). It is positively related to the decision to become an entrepreneur, whereas fear of failure is negatively correlated (Chen et al., 1998; Markman & Baron, 2003; Arenius & Minniti, 2005; Bandura, 2009). Some self-efficacy comes from successful experience or “enactive mastery experience” (Jehn et al., 2008 in Weingart & Jehn, 2009). Having peers, role models, and mentors or teachers in one’s network who provide practical advice and personal encouragement has also been found to have a positive effect on the entrepreneur’s self-efficacy and increases the likelihood a person will start a business in the first place (Bandura, 2009; Aldrich, 1999; Baron, 2000; Koellinger et al., 2004). Bandura points to a number of possible activities that develop self-efficacy; two of those ordinarily occur within a networking context, although Bandura does not make the explicit link with networking. They are social modeling, achieved through seeing people similar to oneself succeed, and social persuasion by credible persuaders—ones

who are knowledgeable and practice what they preach (Bandura, 2009). Similarly, Johannisson (1995) finds that the entrepreneur's confidence in the viability of her venture depends, in part, on knowledge gained through social ties, which is consistent with social comparison theory (Festinger, 1954).

Relatively few studies have considered networks and their impact on entrepreneurs' and others' perceptions of these difficult-to-measure concepts such as legitimacy and self-efficacy; those that have tended to explore these notions in terms of improving chances and reducing the cost of acquiring tangible resources such as labour, electricity, raw materials, or specific skills (for instance, see Zimmermand & Zeitz, 2002) via networks. In that context, network relationships have been studied for their reputational or signaling functions. Entrepreneurs have been found to seek to increase their own legitimacy among resource holders through associating with well-regarded actors. By making their network linkages known, entrepreneurs improve the perception of influential individuals or organizations, thus increasing the chances of acquiring resources (Hoang & Antoncic, 2003).

In sum, there is empirical and theoretical support for the notion that subjective resources of legitimacy and self-efficacy are important to entrepreneurs in and of themselves, and there is also evidence that networks can be used to display or amplify existing legitimacy in an effort to obtain tangible resources. However, our understanding is limited when it comes to the relationship between networking and obtaining intangible resources such as legitimacy and self-efficacy in and of themselves. In other words, the question remains: does networking influence entrepreneurs' and others' perceptions about, belief in the ability of, and sense of legitimacy of particular

entrepreneurs, or even entrepreneurial activity in general? And if so, what is the mechanism of this influence?

2.5.3. Entrepreneurial Storytelling through Networks

One possible mechanism for obtaining resources through networks is storytelling by entrepreneurs, to their networked audiences. Done in informal settings (e.g. networking hour after a presentation) or formal ones (e.g. during a pitch by founders of a startup to potential investors), storytelling has been widely researched by cultural entrepreneurship scholars, as another way to obtain (tangible) resources. Lounsbury and Glynn (2001) define cultural entrepreneurship as “the process of storytelling that mediates between extant stocks of entrepreneurial resources and subsequent capital acquisition and wealth creation (p.545).” They propose a process model of cultural entrepreneurship that has two types of inputs: entrepreneurial stocks of resource capital, which include technological, financial, intellectual, human and social capital, and entrepreneurial stocks of institutional capital, which include industry legitimacy, norms, rules and infrastructure. These two types of inputs are used to create entrepreneurial stories, from which entrepreneurial identity and legitimacy are derived, leading to capital acquisition and wealth creation. Their diagram illustrates the process:

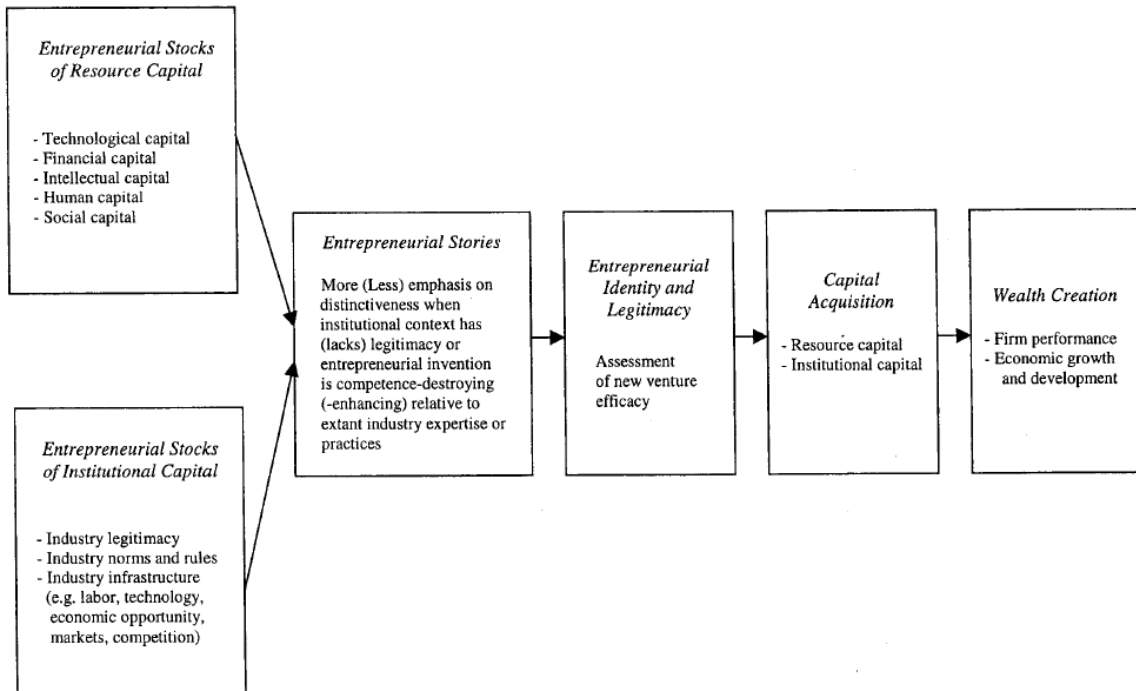


Figure 4: Lounsbury and Glynn’s Process Model of Cultural Entrepreneurship (2001)

Lounsbury and Glynn (2001) show that entrepreneurial identity stories can be traced through media records and company publications; however, they stop short of considering storytelling in network settings, such as at informal gatherings. Their conclusion that “stories may be an important independent mechanism enabling resource acquisition at the early stages of a new venture” still leaves us with the question of how such stories are relayed among key actors of an entrepreneurial ecosystem. One downside of Lounsbury and Glynn’s process model is its linear nature. Human interaction is rarely linear, and even less likely to be in an entrepreneurial network in a sector characterized by complexity and rapid changes of the mobile technology industry, as described in the introductory chapter; however, it is reasonable to assume that Lounsbury and Glynn did not intend to imply linearity of real-world interactions, but instead sought to provide a useful logical model for considering them.

As Ellen O'Connor writes in *Storied Business: Typology, Intertextuality and Traffic in Entrepreneurial Narrative* (2002), the narrative form is essential to human understanding and therefore to meaning-making and identity building processes. This is because events become meaningful only when connected to other events, i.e. when plotted in a story. To tell a story means to establish meaningful connections between events, and thus assign a meaning to one or more sequences of events. O'Connor (2002) examines the role of narrative competence in entrepreneurial practice, and finds that entrepreneurs tell stories to (a) establish the premise for their startup's existence, (b) obtain resources needed for the venture; and (c) as a way of testing alternatives and choosing among them, based on audience feedback. In *Storytelling to be Real: Narrative, Legitimacy Building and Venturing*, O'Connor (2004) goes further to make an explicit link between storytelling and legitimacy building, with a focus on the initial phase of a startup; she finds that legitimacy emerges from conversations in which entrepreneurs tell stories to one another or to other audiences.

Often based on myths and exaggerations, stories of entrepreneurial success are popular and widespread around the world (see Brockhaus, 1987, for a discussion of entrepreneurial folklore). With entrepreneurship covered so widely in the news media, documentary programs, as well as in the entertainment genre, it can be difficult for audiences, including policy makers, to separate reliable, documented narratives from popular accounts of entrepreneurship. From the point of view of legitimacy building, the inaccuracies are nearly inconsequential: stories, true or not, that establish positive associations between success and entrepreneurship, help to establish a positive

perception of entrepreneurship itself, as O'Connor (2000) shows through another, ethnographic study of a Silicon Valley research organization.

Ghaziani and Ventresca (2005) examine the keywords involved in entrepreneurial narratives, in particular by tracking the use of the phrase “business model” within the emerging Digital Economy. They find that such keywords are used to challenge established cultural paradigms—particularly under uncertainty such as that present in a dynamic industry—and that studying the use of keywords provides a way of following changes in ideologies and belief systems, and, arguably, other types of institutions. Thus, by telling stories that include certain keywords and references to entrepreneurial predecessors who were successful (or merely seen to have been successful), entrepreneurs trigger institutional changes, discussed in more detail in section 2.5.5. below.

Not all stories and keywords will do, however. Rather, they must “mesh” (Suchman, 1995) with the beliefs and experiences of others in their network. According to Bandura (2009), self-efficacy can also be achieved through a type of evidence-based storytelling, which he describes as “social persuasion by credible persuaders [who] must be knowledgeable and practice what they preach.” (2009, p. 185).

2.5.4. Rapid Adaptation through Generative Network Relationships

A number of studies relying on complexity theory argue that in ecosystems characterized by uncertainty and rapid changes entrepreneurs tend to establish ‘generative relationships’ that can engender ambience and cooperative environments beneficial for future developments (Lane & Maxfield, 1996). Related to the notion of generative relationships is Johannisson’s (1995) theoretical framework for exploration

of strategic ties in personal networks that trigger “higher-order learning” – acquiring the ability to make judgments needed for making decisions, dealing with unexpected outcomes and synchronizing external events and own action, all of which contribute to entrepreneurial success (Argyris & Schön, 1978). Drawing on Pascale (1990), Johannisson (1995) further contends that personal networks must include two types of strategic alliances: those needed to cope with concrete challenges and those that provide general information and support, allowing for “strategic tension” needed to keep the small and emergent organization as alert as the innovative corporation. According to Johannisson, this tension helps “keep the divergent business and unique concept distinct and viable in spite of external pressures for on the one hand conformity through institutionalization, and on the other hand change as markets evolve (1995, p. 228).” Integrating previous theories of resource acquisition through networks, mentioned above, Johannisson (1995) proposed the following framework for analyzing the functions of personal networks of entrepreneurs:

Network Mission	Benefit to Individual	Benefit to Firm
Social support	<i>Enhanced self-confidence</i>	<i>Increased legitimacy</i>
Resource supply	Refined competencies	<i>Enlarged resource base</i>
Strategic tension	Increased capability to learn and unlearn	Improved agility (flexibility to adapt in a changing setting)

Table 1: Johannisson’s Framework for Analyzing Functions of Networks (Johannisson, 1995, emphasis added)

For this study, Johannisson’s framework was used as a guideline for formulating the basic research model and interview questions but had to be adjusted to suit the concrete Nairobi, Kathmandu and London situations that will be discussed in detail in later chapters. His distinction between individuals and firms as beneficiaries of interpersonal

networking activity is not directly relevant to this study, since small, one- or two-person founding teams could be considered both as firms and as individuals; however, each of the potential benefits he noted is worth considering. At the individual level, Johannisson (1995) theorizes that networks help build self-confidence and commitment needed to take action in an ambiguous setting, increase competencies and therefore extend the repertoire of possible activities and add knowledge necessary to adjust strategically to a changing environment. At the firm level, social ties are used to increase legitimacy for the emerging enterprise, a process which may alter the dominating norms in the business ecosystem and society at large. Resource networks add capacity while maintaining flexibility by removing resource-based constraints, while ties with strategically important actors (such as demanding but committed customers, government regulators or researchers) increase the firm's access to opportunities and support the organization's viability. This study focuses on three network functions: the potential to enhance self-confidence, increase legitimacy, and enlarge the resource base available to entrepreneurs. IS THIS CONSISTENT WITH RQS?

2.6. Institutional Entrepreneurship and Isomorphism

Two additional and related theories are especially useful for analyzing and comparing the overall entrepreneurship ecosystems in Nairobi, London and Kathmandu: the first is institutional isomorphism, developed by DiMaggio and Powell in their 1983 article, *The Iron Cage Revisited: Institutional Isomorphism and Collective. Rationality in Organizational Fields*, and the second is institutional entrepreneurship, advanced by DiMaggio in his 1988 essay, *Interest and agency in institutional theory*, and others since then (see Hardy & McGuire, 2008, and Battilana et al., 2009 for detailed

overviews of the evolution of the concept).

DiMaggio and Powell (1983) discuss the phenomenon of homogenization among institutions, a process that they, at least in part, ascribe to the pursuit of legitimacy, and not necessarily efforts to improve efficiency or performance. DiMaggio and Powell (1983) question the wisdom of mass adoption of a particular institutional model, and do not find any evidence that isomorphism has overall positive effects on an industry. On the contrary, at a certain point, the close resemblance of organizations decreases their diversity, and therefore the industry's ability to innovate, adapt and further specialize in different ways. Despite this, according to them, adoption of a model increases exponentially, since the more firms participate, the more the model's legitimizing function increases. DiMaggio and Powell (1983) present three types of institutional isomorphism: coercive, mimetic, and normative; these types often overlap, or occur in parallel, but are driven primarily by separate circumstances: regulatory pressures in the case of coercive isomorphism, uncertainty in the case of mimesis, and the process of professionalization of a field, in the case of normative convergence. Their framework is intended to help explain the evolution of organizations within an institutional field, however, in the context of this study, it is useful the comparison of the three ecosystems in Kathmandu, Nairobi, and London. Their theory is discussed in detail in section 8.2, in the context of findings presented in chapters 4, 5, and 6.

Considering institutional change more deeply, DiMaggio (1988) coined the term "institutional entrepreneurship," contending that "new institutions arise when organized actors with sufficient resources see in them an opportunity to realize interests that they value highly" (p. 14). In a subsequent analysis, DiMaggio and Powell (1991) noted the

need to further expose the role of individuals in such processes. According to Battilana et al. (2009), such individuals, the institutional entrepreneurs, are the initiators of organizational change and the ones responsible for creating and taking advantage of the opportunity for overhauling old or founding new institutions. Institutional entrepreneurs need not be “entrepreneurs” in the more widely used sense of the word, i.e. they need not be founders of ventures (Battilana et al., 2009), although, in this study, they happen to be, as the results described in subsequent chapters will reveal.

2.7. Analytical Framework

Drawing on the literature mentioned above, and in particular on Lounsbury and Glynn’s process model and Johannisson’s framework, and taking into account storytelling as a possible mode of network action, the following framework and set of assumptions is proposed for this study.

Based on existing literature, the analysis assumes that:

1. Entrepreneurs use networks in pursuit non-subjective resources and subjective resources. Non-subjective resources include labour (human capital), equipment (including industry-specific infrastructure and Internet access (technological capital), specific knowledge and information (intellectual capital) and financing (financial capital). Subjective resources include industry legitimacy, firm legitimacy, entrepreneur legitimacy, self-efficacy, and command of industry norm and rules (Hall, 1992).
2. In the process of obtaining both types of resources, entrepreneurs are subject to environmental constraints; in the case of mobile technology entrepreneurs,

many of these stem from the dynamic nature of the industry, which makes keeping up with relevant information difficult. In addition to industry-specific circumstances, cultural norms and rules further influence behaviour; for example, a society may be resistant to adoption of new technologies or may value the safety of traditional employment much more highly than the creativity and opportunity offered by entrepreneurship.

If entrepreneurs are successful in obtaining resources for self and firm, and combining them effectively despite environmental constraints, their efforts may result in a viable new venture; further, the patterns of their behavior and the outcomes of such behavior may result in changes to their environment, i.e. the mobile entrepreneurship ecosystem.

One approach to this involves storytelling in the context of networks.

This framework can be represented in the following chart:

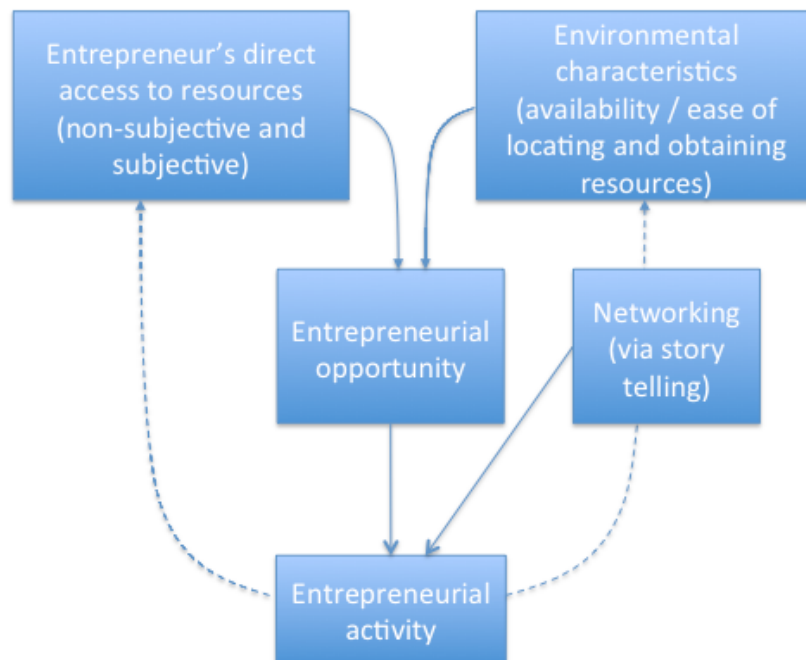


Figure 5: Proposed Analytical Framework

The components of the framework correspond roughly to the research questions presented in the first chapter, but also allow for analysis of unanticipated findings, for instance related to environmental constraints. It is expected that the cases will vary in terms of opportunities and constraints present in each ecosystem; these differences may or may not have an effect on the motivations of entrepreneurs to engage in networking. Thus, for instance, in one city, the emphasis may be on the need for changing of the ecosystem to improve its infrastructure, ease of access to tangible resources, and legitimacy of entrepreneurship as a choice; in another, the emphasis may be on increasing the technical skills of entrepreneurial teams, or on securing financing through networks.

2.8. Chapter Summary

This chapter has proposed a definition of entrepreneurship that is broader than most, in that it recognizes entrepreneurs as soon as they engage in entrepreneurial activity, and well before there is any proof that their products or services will be adopted by the market, let alone result in significant disruption. Instead, creative intent and acting on that intent is seen to be the minimum threshold to recognize someone as an entrepreneur. Further, following Shane and Venkataraman's (2000) clarification that entrepreneurship does not require, but can include, the creation of new organizations, this chapter notes that the presence of entrepreneurship activity precedes creation of new firms, especially in the early days of an industry's development. Environmental and regional perspectives have produced a rich literature on clusters and networks, as discussed and critiqued above, with an emphasis on the concepts of embeddedness,

social capital, resource acquisition and knowledge spillovers. While the notion that entrepreneurs use networks to obtain resources has been confirmed in literature, the assumption that resource acquisition is the only, or even the strongest, motivation for entrepreneurs seems to remain entirely untested. No studies seem to have placed the focus on the entrepreneur's own explanations of value they see in networking; therefore, a myriad of alternative motivations remain unexplored. Networks have been shown to facilitate resource acquisition, and discussion on strong and weak ties has been particularly prominent in this context. The resources considered have been, for the most part, very objective, often consisting of physical inputs into a business, finances and technical information and knowledge. A considerably smaller body of work concerns itself with the role of entrepreneurial networks in obtaining subjective, yet equally important assets such as legitimacy and self-efficacy. The proposed analytical framework represents an attempt to integrate a number of existing theoretical positions while allowing for greater consideration of the role of networks in the acquisition of "soft" resources.

3. Methodology

This chapter presents the process and rationale used in a) selecting three distinct city-based cases of mobile ecosystems in an early stage of their development; b) collecting data through focus groups, semi-structured interviews, participant observation and document review; and c) employing a qualitative approach to analyzing data.

Limitations, sources of bias, questions of validity and ethical considerations, along with the analytical framework are also discussed. Methodological decisions were made with three distinct considerations in mind: one, the nature of the research questions, presented in Chapter 1; two, the unique challenges for research presented by the nascent nature of mobile applications ecosystems (Tarnacha & Maitland, 2006), with a changing and diverse set of actors and relationships; and three, the relative lack of institutions and infrastructure in two of the case study countries, namely Kenya and Nepal (Wyche et al., 2010; Gasmi & Recuero Virto, 2005).

3.1. Theoretical Premises for Methodological Decisions

Several general theoretical premises regarding the nature of the broad subject matter of technological innovation ecosystems have influenced the choice of methods, in particular those related to innovation networks.

3.1.1. Networks of Entrepreneurs as the Unit of Analysis

Innovation is widely recognized as a social process involving interaction, alliance, and cooperation of different actors (Freeman, 1991; Powell et al., 1996). This is especially

true in developing economies, where market failures and institutional weaknesses may be particularly severe, and thus entrepreneurs may find that networks can be used as safety nets against uncertainty and unfavorable business climates (Giuliani & Pietrobelli, 2011). Discussions focused on methodological dilemmas for studying entrepreneurship have taken the social nature of innovation into account (e.g. Johannisson, 1995). It is understood that entrepreneurs, more or less actively, enlist the support and contributions of different stakeholders (such as friends, peers, families, mentors, customers) in their process (Berglund, 2007). In this sense, the development of the venture is determined by a group of actors that interact in order to constitute opportunities, identify risks, set goals and create markets (Cyert & March, 1963). While the area of entrepreneurship research is still relatively young, there is consensus that entrepreneurship is not an individual endeavor (Gartner et al., 1994; Johannisson, 2000). As Schumpeter (1934) suggests, the entrepreneurial function is often dependent on the entrepreneur's social surroundings. Schumpeter also argues that innovation often necessitates collective action to achieve adaptation, using as his example the U.S. Department of Agriculture and the agency's role in the introduction of technology. More recent literature on interactive learning, the nature of innovation and innovating regions has supported Schumpeter's work (Burrell & Cook, 2009; Etzkowitz, 2003; Lundvall, 1992). Studies of entrepreneurial networks (e.g. Birley, 1985; Burt, 2002; Powell & Grodal, 2005) and the role of social ties in innovation (Granovetter, 1983; Hansen, 1999) provide a precedence in the choice of a network as the unit of analysis, and have shown effectiveness of this choice in demonstrating a reliance of entrepreneurs on their personal connections along various stages of the innovation

process. Further, the approach appears useful in the quest for better understanding the relationship between specific features of a network and individual attitudes and behaviour (Freeman et al., 1989).

The choice is also a result of recognition that entrepreneurs can only operate within their organizational (Shane & Venkataraman, 2000), economic, social and institutional contexts (Veciana & Urbano, 2008), which inevitably influence their outcomes. This is reflected to an extent in the literature on social capital, which has focused on the relationships between new venture founders and other actors in their industry, with particular attention on the networks of contacts the entrepreneur develops and draws from in her business development process (Canina et al., 2011). The notion of social capital starts from the assumption that the entrepreneur's social networks can become a source of competitive advantage (Canina et al., 2011) and has encouraged inquiry into topics such as network creation, encouragement and upkeep (Fuentes et al., 2010; Fuller-Love, 2009). However, the term "social capital" introduced into sociological literature in the 19th century (Portes & Landolt, 1996) and since used to examine advantages of spatially proximate ties to individuals belonging to groups (e.g Jacobs, 1961; Hannerz, 1969), focuses on the individual and does not capture in detail the role of networks to which entrepreneurs belong; in other words, distinctions between different types of "social capital" and their origins are not explicitly demarcated. According to Bourdieu (1985) and Wacquant, who popularized the term:

[Social capital is] the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition.
(Bourdieu & Wacquant, 1992, p. 119)

Other authors have studied networks and entrepreneurs' activity within them to access resources that help them reduce information asymmetries, increase bargaining power vis-a-vis other market actors, including supply-chain intermediaries, competitors and governments, and allow existing firms to adapt to changing market conditions (Guillén, 2000; Khanna & Rivkin, 2001; Mesquita & Lazzarini, 2008; McDermott et al., 2009). In poor regions, networks have been found to be especially important, as they frequently offer efficiency gains that individuals or very small firms cannot realize (Schmitz, 1995). For rural farmers in Africa or Asia, networks have been found to be important in reaching markets, achieving shared economic goals and share risks by pooling resources (Pietrobelli, 2009). However, studies of the role of networks in nascent technology ecosystems, particularly in poor countries, are not readily found; at the same time, with the global mobile infrastructure constituting the largest communications, service and product delivery platform in the world, reachable from all of its corners, exploring this role seems timely. Finally, the choice of network as the unit of analysis was made with the goal of comparing the three ecosystems in mind, i.e. because the comparison would be made at the level of the collective, and not the individual. Due to a relative scarcity of current data about network related features of the mobile ecosystem in the chosen cities, a qualitative approach was chosen, as the next section describes.

3.1.2. Qualitative Case Study Approach to Investigating Networks

Networks can be studied through a number of different methods. Two frequently employed approaches were considered for this project: social network analysis (SNA),

which is based on surveys (Carrington & Scott, 2011; Marin & Wellman, 2011), and the case study method, based on qualitative or mixed-methods approaches (Yin, 2002), chosen here. Social network analysis rests on the distinct perception that relationships among actors are important to explain their nature, behavior, and outputs. To represent findings, SNA uses graph theory, a mathematical discipline initiated in the 18th century (Newman, 2003), and extended to social science in the 20th century (Moreno, 1934). Graph theory involves data requirements that constituted a problem for empirical application in this project. Namely, required relational data on mobile entrepreneurs in the cities chosen (described below) was not available prior to this study; further, as the membership in networks in the mobile ecosystem is variable, as is the makeup of the ecosystem actors in an early stage industry, it was not possible to identify a finite and inclusive set of network members due to the rapid pace of change in the industry and the networks involved (and evolving) within it. In other words, it was not possible to confirm that the observed network structure would correspond to the actual relations, which would have been a requirement of the methodology (Laumann et al. 1989). Most importantly, while social network analysis results in a visual representation of relationships and can shed light on the role of distances and number and variety of connections in a network, it cannot answer open-ended questions, which are a methodological necessity when previous research is scarce, such as in the case of emerging industries. In instances where research questions are intended to uncover new information that could not be adequately described or interpreted via quantitative method, focus groups and interviews can provide a more useful course of investigation (Strauss & Corbin 1990; Hoepfl, 1997). Due to its ability to generate rich insights and

detailed explanations of social phenomena (Yin, 2002; Eisenhardt, 1989), a case study approach, relying on qualitative methods, was chosen for this research project.

Qualitative research is inductive, in that theory is generated from research; it takes an interpretivist epistemological position, allowing for participants' interpretation of the world, recognizing that social properties, attitudes and beliefs are inseparable from the interaction between individuals (Bryman, 2008). Case studies allow the researcher to explore individuals or organizations, simple through complex interventions, relationships, communities, or programs (Yin, 2002) and to support the interpretative deconstruction and the subsequent reconstruction of various phenomena. Robert Stake (1995) and Robert Yin (2002), whose approaches to case study research are among the most widely used, have discussed case study design necessary for adequately exploring the topic of interest and revealing the essence of the phenomenon. Both Stake and Yin base their approach to case study on a constructivist model, which considers truth to be relative and dependent on one's perspective (Baxter & Jack, 2008). An advantage of such an understanding is the recognition of the importance of enabling participants to describe their experiences in their own words (Crabtree & Miller, 1999). In this way, participants relay their interpretations of reality, exposing the researcher to different contextual understandings and helping the researcher better understand participants' actions and other phenomena (Lather, 1992; Robottom & Hart, 1993). The approach is especially helpful to the study because it had to account for the likelihood that the three different cases considered would differ significantly in terms of culture and vocabulary used by mobile entrepreneurs.

In this instance, there are also particular concerns about the usability of the

findings. Many researchers from the global South note that Western academics produce research findings that are often inaccessible to scholars in developing countries due to cost-related or other difficulties such as language or terminology used (Macklin, 2004). With relevant research on mobile ecosystems in developing countries already scarce, it was important to present findings in a form that can be easily understood by readers most concerned with those ecosystems. According to Hoepfl (1997), qualitative data can be helpful in describing phenomena more fully not only from the researcher's perspective, but also the reader's perspective, in part because they may be epistemologically closer to the reader's experience which need not coincide with the researcher perspective and terminological apparatus:

If you want people to understand [something] better than they otherwise might, provide them information in the form in which they usually experience it.
(Lincoln and Guba, 1985, in Hoepfl, 1997, p. 50)

It is hoped that case studies based on qualitative data analysis presented here will be useful to the communities from which they were sourced.

3.2. Selection of Cases

Given the relatively low cost of mobile devices and significant mobile infrastructure investments in many countries, it is unsurprising that the global mobile industry has reached some of the most remote corners of the world (James, 2010), including very poor countries under extreme stress, such as Afghanistan (Chipchase & Lee, 2011).

What is surprising, however, is that many vibrant mobile entrepreneurship communities seem to be flourishing in a variety of environments, as more than 100 chapters of

Mobile Monday, the networking organization for mobile startups seem to indicate. Anecdotal evidence of mobile innovation far from the usual locations such as Silicon Valley is widely available, as is reflected in frequent media features on mobile apps in African, Asian or global contexts (for example, see *Mobile Phones in Africa*, 2010; *Banking on Mobile Phones*, 2010; *Makers of Mobile Devices*, 2011; *Not Just Talk*, 2011; *Revving Up the Pace*, 2011; *Upwardly Mobile*, 2012, 2012b *Mobile*, 2012; *Vital for the Poor*, 2012; *Start Me Up*, 2013; Fox, 2011; Holland et al., 2012; McGrath, 2012; Baker, 2012; Gatehouse, 2012; Shapshak, 2012).

Based on a preliminary review of literature (Donner, 2010; World Bank 2009; Donner, 2008; Barrantes & Galperin, 2008; Rouvinen 2006; Donner, 2004; Banerjee & Ros, 2004), and extensive conversations with mobile industry professionals and employees of the global secretariat of Mobile Monday, seventeen city-based cases were initially considered for the study. These can be considered to belong to two groups. The first consists of recognized centres for technology innovation in emerging and developed markets: Nairobi, Kenya; Accra, Ghana; Johannesburg, South Africa; Hyderabad, India; Tel Aviv, Israel; Tallinn, Estonia; New York, USA; San Francisco, USA, and London, UK (Pengfei & Kresl, 2010; OECD, 2009; Economist Intelligence Unit, 2010; Högselius, 2005). The second group includes environments where mobile entrepreneurial activity was present but its significance and potential were unclear, i.e. little was known about these cities as mobile innovation ecosystems. This second group consisted of Kampala, Uganda; Tbilisi, Georgia; Chisinau, Moldova; Baku, Azerbaijan; Ho Chi Minh City, Vietnam; Kathmandu, Nepal; Santiago de Chile, Chile; Sao Paulo, Brazil (OECD, 2009; World Bank 2009; Högselius, 2005). For practical reasons,

however, the scope of the research had to be narrowed down. Of the seventeen centres, three stood out: Nairobi, Kathmandu and London.

Kenya is Africa's third leading mobile market in 2012 after South Africa and Nigeria (Communications Authority of Kenya, 2012b). The increase in availability of broadband Internet due to connection to the Internet backbone via fibre optic cables in 2009, a price war between network operators and a long tradition of entrepreneurship contributed to a fast growing community of startups based around mobile apps. The high growth in mobile penetration, coupled with a relatively stable economy, is of particular interest, as an early case of the industry's development in an emerging market country.

Nepal is one of the world's least developed countries, with a human development index lower than all other Asian countries' except Afghanistan (United Nations Development Program, 2012). Yet the initial literature review and informal conversations with local developers uncovered an active, recently formed community of mobile entrepreneurs whose skills seemed high; for instance, online discussions on MobileNepal.net included technical conversations about the latest smartphone operating systems which were not common in the country. In other words, it seemed that Nepal's mobile developers and entrepreneurs were keeping up with global advancements, despite the very limited potential offered by their local market. This contradiction made Nepal's mobile ecosystem of particular interest.

Britain offers one of most developed mobile markets in the world in terms of competitive pricing, availability of network technology and mobile devices and skilled labour (Ofcom, 2012; International Telecommunications Union, 2012). References to

London as a centre of mobile innovation were found in the initial literature review (for an integrative discussion, see, for instance, Foord, 2012) and in early conversation with potential informants, mobile industry professionals and entrepreneurs. Strong entrepreneurial activity has emerged in the area of East London near Old Street, earning the nicknames of TechCity and Silicon Roundabout (McAllister, 2012). A number of mobile networking clubs operate there, including Mobile Monday and Swedish Beers, described by founders as “an ad-hoc London based mobile networking event, [with] nothing formal, no speakers, no PowerPoint, nothing flashy, just turn up and mingle,” amusingly, without any apparent connections to Sweden (Swedish Beers, 2012). Given the sharp contrast between London’s social environment and mobile ecosystem, and those of Kenya and Nepal, it seemed meaningful to investigate whether there were any—or no—similarities in the ways the selected mobile entrepreneurs rely on their networks.

These cases were chosen also because they were different from one another in terms of markets. Thanks to high mobile penetration in Kenya, Nairobi’s entrepreneurs had access to a potentially large local customer base. Kathmandu’s did not, and instead, seemed to target foreign customers while working to develop a local marketplace. Finally, London’s successful mobile entrepreneurs were found to be dedicated to local as well as foreign mobile apps users.

The three countries are also very different economically. Gross national income (GNI) per capita, taken as a measure of the country’s income levels, was \$540 in Nepal in 2011, \$820 in Kenya and \$37,780 in the UK (World Bank, 2011a). These differences pointed to a possible variety of mobile ecosystem constraints and structures worth

exploring, since unique structural factors influence entrepreneurs innovation strategies and potential (Nelson, 1993). In addition, comparing differences and similarities across the different ecosystems of the three cities allows for more reliable conclusions about features of entrepreneurial networks that appear regardless of the differences and characteristics that are specific to each location.

The choice of methodology consisting of analyzing networking behaviour of entrepreneurs is possible in part due to the presence of analogous networking organizations in all three cases; these organizations include Mobile Monday in Nairobi and London, and Mobile Nepal in Kathmandu, among other associations and networks. What is unique about the networking organizations chosen for the study is their formation at the time of emergence of the mobile technology industry, and the explicit focus of their activities on mobile software and entrepreneurship. The three settings are discussed in more details in each of the case chapters.

3.3. Data Collection

Following initial conversations with a range of mobile industry actors from each city via Skype or in person in Nairobi, Kathmandu, London, Oxford and other locations, it became apparent that focusing the investigation on mobile entrepreneurs and their personal networks could be a feasible way to discover interesting, new data for the study of emerging mobile ecosystems, which could help develop more comprehensive research tools: these early conversations indicated that entrepreneurs, especially when self-organized into networks, could be the most significant forces to influence the evolution of the mobile ecosystem. Guided by these early discoveries, focus groups and

semi-structured interviews were conducted with entrepreneurs, and these were complemented with participant observation during networking meetings, and document review. This section outlines data collection procedures used in the study, beginning with stating key definitions used in selecting cases and qualifying interview participants.

3.3.1. Defining Entrepreneurs and Networks

The first step in data collection was to narrow down the definition of entrepreneur, according to the goals of the research. For the purposes of this study, entrepreneurs were defined as founders or co-founders of mobile startups that have successfully launched at least one viable mobile application into the market. Some of these founders held on to other jobs, while working on their ventures in their free time. Employees, programmers contracted by a startup or other freelance developers were excluded from the definition, even if they were involved in a startup company from its earliest stages. In each case, the entrepreneur had to have launched at least one mobile software application that has been adopted (i.e. downloaded) by a number of users (usually more than 25, although an exception was made in two cases where the app was very newly launched). Preference was given to entrepreneurs whose mobile applications were revenue-generating, but this was not always possible due to the early-stage nature of the industry and a number of infrastructure constraints (such as a lack of payment gateways), discussed in more detail in the results chapters. Even under such a relatively narrow definition, which implies a certain homogeneity of the category “entrepreneur,” it should be noted that entrepreneurs are not a homogeneous group in all respects.

Fauchart and Gruber (2011), for instance, describe three “pure” types of founder identities in the sports industry: Darwinians, who tend to be successful in competitive market systems; communitarians, who consider their firms to be social objects; and missionaries, who treat their enterprises as political entities. While most mobile entrepreneurs interviewed here are likely to belong to the Darwinian category, it is plausible that some belong to the latter two categories, and that differences of this type could help explain variation in behaviour and perceptions among the study participants. Either way, the focus of this study was on benefits and possible pitfalls of networking activities, rather than on types of entrepreneurs; therefore, the questions which would have made it possible to test if Fauchard and Gruber’s interesting categorization applied to the respondents were not planned and not asked.

The definition articulated by Drakopoulou Dodd and Patra (2002) was used as a starting point in identifying networks of entrepreneurs. According to them,

Entrepreneurial networks can be defined as the sum total of relationships in which an entrepreneur participates, and which provide an important resource for his, or her, activities. These relationships may be articulated through the mechanism of membership in formal organizations, through the links an entrepreneur develops with suppliers, distributors and customers, or through the utilization of social contacts, including acquaintances, friends, family and kin.
(Drakopoulou Dodd and Patra, 2002, p.117)

Thus, the networks referred to in this study consist of interpersonal relationships between mobile entrepreneurs and their families, friends, peers, colleagues, mentors, partners, competitors, investors, customers, government representatives and other mobile industry actors.

3.3.2. Summary of Completed Research

In each city, data was collected in four ways: through preliminary focus groups, document review, semi-structured interviews, and participant observation. The figure below summarizes completed research.

	Focus Groups	Semi Structured Interviews	Participant Observation	Document Review
Kathmandu	Conducted in December 2011 with 19 participants	Conducted December 2011 – May 2013, with 14 entrepreneurs	Conducted in December 2011	Conducted March 2011 – December 2012
Nairobi	Conducted in March 2011 with 18 participants	Conducted March 2011- March 2012, with 23 entrepreneurs	Conducted in March 2011 and May 2012	Conducted March 2011 – December 2012
London	Conducted in June 2011 with 20 participants	June 2011 – January 2013, 12 entrepreneurs	Conducted in February 2011, March 2011, July 2011, November 2012	Conducted March 2011 – January 2013

Table 2: Summary of Completed Research

The total number of informants was 106, of which 33 were in Kathmandu, 41 in Nairobi and 32 in London. Overall, there were 57 group participants and 49 interview respondents. The slightly higher number of Nairobi respondents was largely the result of the fact that Nairobi respondents suggested more additional entrepreneurs for interviews than in the other two cities.

One noticeable difference between interviews in Kathmandu and Nairobi on the one hand, and London on the other, was the speed of speech, which was much higher in London. There was no significant difference in the mean times each interview took, however, London entrepreneurs managed to provide more detailed answers to interview

questions. Interestingly, the opposite was true in the focus group discussions, where London entrepreneurs gave shorter answers, although the difference in the case of focus groups was less pronounced.

3.3.3. Focus Groups: Sample Selection and Procedure

In the period between March and December 2011, focus groups were held in three cities: Nairobi, Kathmandu and London with 18, 19 and 20 participants respectively. Focus group participants were selected in consultation with managers of informal network email list managers in each city; managing such lists was not part of their official job or other responsibilities, and, in each case, the list managers were mobile entrepreneurs themselves. These initial contacts with the managers were made via my own existing professional contacts in the cases of Kenya and Nepal, and by simply emailing the list manager in London. The purpose of the focus groups was to verify the relevance of the research questions, to collect information that could be helpful in developing the interview questionnaire, and to establish contact with mobile entrepreneurs and others in their networks.

In Nairobi, the focus group was held in the building that houses the iHub, a popular co-working and events space for technology entrepreneurs. The exact location was the floor directly under the iHub; on the day of the focus group, the space was undergoing construction in preparation for the setup of a new mobile applications lab, which planned to provide business incubation, mentoring and app testing facilities for Nairobi's mobile entrepreneurs. The space was suggested and arranged for by the coordinator of the new mobile lab, who also managed an open email list of mobile entrepreneurs used to share tips, articles, news, job advertisements and questions related

to their projects. Since the space was easily accessible and already frequented by the mobile entrepreneurs, developers and other industry actors, it provided an ideal venue. On the day of the focus group, the space resembled an empty warehouse with bare concrete flooring and freshly painted white walls, and no furniture, visible electrical outlets or lighting fixtures. Focus group participants sat in a circle on plastic picnic chairs borrowed from a nearby business. What the space did have installed even at this early stage, however, was a wireless router that provided fast and reliable broadband to mobile developers. This alone was enough to ensure that technology entrepreneurs would readily flock to the location even before the lab was fitted with office and testing facilities, eliminating the need for a special trip in order to participate in the focus group for most attendees. A handful of representatives of nearby mobile handset shops and of large mobile industry corporations, who would not have otherwise been on site, were invited and also attended.

A similar arrangement was made in Kathmandu, in a more established space lent by a non-profit organization that offered technical training to students, young professionals and employees of non-governmental organizations. This space did not offer any internet connectivity except during training, was not centrally located, and was only visited by entrepreneurs for specific events; however, it was easily accessible by motorcycle and car and the non-profit operated a small cafeteria with food of good quality sold at very reasonable prices. Therefore, it had become the site of frequent informal gatherings for existing and aspiring mobile entrepreneurs after training events. The focus group was arranged to take place immediately after one such informal gathering, held in the days leading up to a major national conference on the mobile

industry.

In London, a focus group with 20 entrepreneurs was held immediately after a Mobile Monday gathering, in a conference room of the GSM Association headquarters in central London. The focus group was organized with the help of one of the coordinators of Mobile Monday London. As in the other two cities, the room had an open area where chairs could be arranged in a circle.

Due to the fact that the Nairobi and Kathmandu focus groups contained few women and also to the fact that relatively few women mobile entrepreneurs exist in these two cities, special efforts were made to include more women in the London discussion. For instance, the focus group was scheduled in the same space as, and on the day of, a series of panel presentations on the topic of women involved in the mobile industry.

Each focus group lasted approximately two hours. Participants were first welcomed by the researcher and invited to take a seat. At some point during the focus group, they were also offered light refreshments (in the case of London, refreshments were provided during the Mobile Monday meetup). Once most participants were present, they were briefed by the researcher about the project and asked for written consent. Each person then introduced her or himself, before engaging in a discussion around the following topics introduced by the researcher:

1. Examples of successful, local entrepreneurs and their mobile apps;
2. Typical ways in which entrepreneurs and developers work, i.e. the creative process;
3. Sources of industry knowledge, news, training, labour, finances and other

resources needed for mobile app development;

4. Participation in networking meetings such as Mobile Monday, Google

Technology User Groups, and other collegial gatherings;

5. “Pros” and “cons” of participation in such meetings;

6. Participants’ visions for the local mobile industry.

Attendees were asked open-ended questions and encouraged to give their views on the topics or to introduce related topics missed by the researcher. In Kathmandu and Nairobi, the majority of focus group respondents were men, with the average age of 26 and 30, respectively. In London, the group was better balanced in gender terms, and older on the whole, with an average age of 33.

	Gender		Age		
	Women	Men	16-24	25-35	35+
Nairobi	4	14	5	10	3
Kathmandu	1	18	6	11	1
London	9	11	1	9	10

Table 3: Gender and Age of Focus Group Participants

Participant profiles can be found in Appendix C, limited in terms of detail to ensure anonymity. In all cases, there was some overlap among the informants: in London, five entrepreneurs who attended the focus group were also interviewed; in Nairobi, the overlap consisted of three entrepreneurs, and in Kathmandu, five informants contributed via focus groups and interviews.

3.3.4. Semi-structured Interviews: Sample Selection and Procedure

In each city, the goal was to choose a sample of entrepreneurs who had launched mobile apps onto the market, and to seek to better understand their reliance on their networks via a qualitative exploration of strategic ties and relationships between these mobile

entrepreneurs and other ecosystem actors. The sampling frames in the three cases were confined to member email lists maintained by networking organizations; these lists were used to advertise networking activities, to allow group communications among members, and more generally to manage the functioning of the networks. In each case, the initial contact recommended between three and six individuals who were part of the network (as members of aforementioned email lists) and who identified subsequent respondents. Further information about the networks considered and chosen is provided in the case-specific chapters.

In Nairobi, which was the first location studied, it was relatively easy to access groups of mobile developers who also considered themselves to be entrepreneurs; however, establishing which ones had been successful in launching products onto the market was more difficult. In order to achieve this, snowball sampling was combined with document review in order to identify eligible participants. This process was then repeated in Kathmandu and London. Bryman (2008) discusses convenience sampling, snowball sampling and quota sampling as the chief types of non-probability sampling. Convenience sampling involves choosing participants simply on the basis of the fact they are available to the researcher. Bryman argues that this type of sampling may be appropriate for piloting research instruments, or when a rare opportunity to gather valuable data presents itself is “too good to miss” (Bryman, 2008, p. 183). These instances aside, convenience sampling is rarely useful, since mere convenience is unlikely to result in a sample appropriate to the research goals. Quota sampling, which is used primarily in commercial research, aims to produce a sample that includes relative proportions of people in different demographic categories, such as those related

to gender, ethnicity, age, socio-economic status, religion, and so on; however, the choice of respondents is still dependent on the interviewer, and does not result in a representative sample (Bryman, 2008). Further, in the attempt to make judgments about certain characteristics of respondents, the researcher may make incorrect conclusions, increasing the scope of possible bias (Bryman, 2008). For these reasons, the approach is not frequently employed by academic social researchers. Compared to convenience and quota sampling, snowball sampling has a number of advantages. The method produces a sample through referrals made by participants who know or can identify others who are of interest to the researcher and is applicable when the focus of the study is a population that is not easily identified and thus requires the knowledge of insiders to locate participants (Biernacki & Waldorf, 1981). According to Coleman (1958), the method is particularly useful for the sampling of natural interaction units. Like quota sampling, snowball sampling is unlikely to produce a sample representative of a population since identifying respondents through referrals by other respondents will, at least in some part, be influenced by the relationship between the referrer and referred. Snowball sampling is appropriate when a representative sample would be difficult to achieve regardless of the sampling technique employed, such as when it is difficult or impossible to determine the size or makeup of a population (Bryman, 2008). This was true in the case of mobile entrepreneurs in the cities chosen; as mentioned above, relational data on mobile entrepreneurs in the cities chosen was not available prior to this study and since the mobile ecosystem itself is in an early stage of development, the size of and membership in networks in the mobile ecosystem is variable. Thus, since it was not possible to identify, or even estimate with confidence a finite and inclusive set

of network members, choosing a sampling methodology that resulted in a representative sample was not possible. Due to its use of referrals, snowball sampling has the advantage of assisting the establishment of trust between the researcher and the respondent (Biernacki & Waldorf, 1981). For a Western researcher unknown to the local population, this proved to be a great advantage in reaching participants and securing interviews in this study. Since the goal of the project was to produce rich insights into the roles of networking in mobile ecosystems, and given the benefits of the approach – including the ability to gain rapport and participants’ trust, as well as a deeper understanding of responses (Bryman, 2008), snowball sampling was chosen for the selection of participants.

As a first step in the preparation process, an interview guide (provided in Appendix E) was drafted, based on the research questions and results of the focus groups. This guide was used to provide direction to the semi-structured interviews, but was not strictly adhered to, in order to allow for respondents to elaborate on particularly important topics or those on which participants had unique insights. Second, initial contacts were made with focus group participants who had self-identified as mobile entrepreneurs during the focus groups (three in Nairobi, six in Kathmandu and two in London) and with email-list managers of networking groups in each city (two in Nairobi, two in Kathmandu and two in London). Thirteen of these seventeen contacts agreed to an interview. Third, pilot interviews were held with four of the five contacts established in Nairobi, three in person, and one via Skype. Following the pilot interviews, the interview guide was shortened and simplified, in order to allow for an interview time of under 75 minutes and to clarify some of the questions through

addition of examples or prompting words. As can be seen from the interview guide, participants were asked to recommend other successful mobile entrepreneurs from their cities, to be recruited for the study. Each of the initial interviews yielded between two and five new potential participants. Starting with Nairobi-based participants, additional potential respondents were contacted on the recommendation of initial contacts. Those who agreed to be interviewed were then asked for the names of their mobile apps and/or companies. Prior to scheduling interviews, document review related to these apps and companies was conducted to establish their existence and adoption. This consisted primarily of reading online content, such as websites, news reports and media materials; judgments about the existence and adoption of the mentioned apps were made on the basis of documentation available, as described in the next section. If it could be concluded that the entrepreneurs had successfully launched at least one mobile app, they were invited to an interview.

Of the total of 49 interviews in the three cities, 19 were conducted in person (seven with Nairobi participants, two with Kathmandu-based respondents and 10 with London entrepreneurs), and 30 were carried out via Skype's voice-over-IP technology, similar to telephone interviews. Skype is a technology generally familiar to and used by mobile developers (Bergvall-Kareborn & Howcroft, 2011), and proved to be an economical—in terms of time and monetary cost—and reliable way to reach participants. Conducting the conversation through Skype's voice chat feature was comparable to telephone interviewing, while the option to communicate in writing via the textual chat window provided the opportunity for respondents to point the researcher to websites or other online materials relevant to the conversation, or to clarify the

spelling of the names of products or services mentioned by the entrepreneur.

Most interviews lasted between one and two hours. Questions followed the broad research goals, in order to identify: 1) sources, whether individuals or organizations, to which entrepreneurs turn in search of resources needed to establish their venture; 2) types of resources entrepreneurs seek and obtain via their networks; and 3) risks inherent in such participation. At the start of each interview, entrepreneurs were asked to describe their mobile apps businesses, and then to identify resources they needed at various stages of the business development process that they didn't have. Subsequent interview questions focused on the processes entrepreneurs use to obtain the necessary resources from their environments. They can be grouped into the following five topics: a) resources sought by entrepreneurs at each stage of the business development process, such as information or knowledge useful for building their business, financing, labour, or broadband internet, b) sources of those assets, which included members of personal networks as well as organizations such as universities and community internet boards, c) risks of networking, d) rewards or benefits of networking and e) organizational members of entrepreneurs' networks. Accordingly, interview data was coded and grouped into the categories, each corresponding to one of these topics. A summary of the way in which data was systematized can be seen in table 4 below.

Topics	Categories
Resources sought by entrepreneurs (prompted except broadband internet and office space)	Information/knowledge Labour Financing Broadband internet Office space

Sources of resources (unprompted)	Friends Family Acquaintances (including customers) Peers Mentors Internet Universities Competitions Tech hubs (e.g. incubators and dedicated social spaces)
Risks of networking (unprompted)	Idea theft Loss of time Loss of funds Loss of focus
Rewards of networking (unprompted)	Community support Friendship Market information Idea validation New skills Partners Mentors Access to finance Marketing support

Table 4: Topics and Categories Emerging from Data

For coding purposes, information encompassed related (and unprompted) terms mentioned, including learning materials such as programming textbooks, mobile development manuals, online tutorials, and message boards, advice, idea validation, tutoring, and strategic guidance. Labour encompassed related descriptors such as employees, workers, staff, developers, team members and help in the context of completing tasks. The finance code, similarly, subsumed the words investment, money, funds, loans, and grants. Almost all of the resources mentioned without prompting fell under one of the three categories, information, labour or finance, which were the resources predicted in literature as important to entrepreneurs. One other resource, which was not explicitly anticipated in the design of the study, but was frequently mentioned without prompting, was broadband Internet. As a researcher, I had not

initially considered the possibility that broadband Internet may be a specific resource sought via their networks; however, respondents clearly indicated that a fast Internet connection was a scarce, expensive and important resource for their business and that they often depended on peers and other individuals in their network for reliable access. Other resources named occasionally included office space and equipment, such as software and hardware (for instance, mobile handsets for testing apps, and computers for programming).

A set of questions asked where or to whom mobile entrepreneurs turned in order to acquire four categories of resources—information, financing, labour or other—needed at each stage of the apps development process. The answers were coded into the following categories: friends, family, acquaintances (which occasionally included customers or early users), peers, mentors, tech hubs (such as co-working spaces and incubators), competitions, the Internet, and universities. After discussing resources with each entrepreneur and establishing that at least some of those were sourced via their networks, respondents were asked to elaborate on the benefits or rewards of participating in networking activities. Where necessary, they were prompted by examples of community events such as Mobile Monday Nairobi or Startup Weekend Kathmandu, or smaller and less formal gatherings such as impromptu meetings with friends or colleagues over tea, or conversations about their businesses at the university, or at home with friends and family. Answers to questions related to benefits and rewards of participation in networks resulted in considerable overlap with answers about sources of useful resources. The benefits or rewards mentioned by respondents were grouped into the following codes: market information, idea validation, marketing

support, financing, business partners and social support or encouragement. Participants were also asked to describe their businesses at the beginning of each interview in order to verify their qualification for inclusion in the study, and, at the end, to cite examples of organizations such as business incubators, or networking associations useful to mobile entrepreneurs in their app development process.

Despite efforts to achieve a gender balance by involving leaders of women's networking organizations or prominent women entrepreneurs in the participant recruitment process, only four of 23 Nairobi respondents were female, while in Kathmandu, only one of 14 respondents was a woman. In London, the imbalance was smaller: five of the 12 respondents were women. The small number of women is related to the low percentages of female technology professionals (including startup founders) in Kenya and Nepal, which, in this respect, reflects a global trend. Namely, around the world, women comprise only around 3% (Kauffman, 2009) to 4% (Evaluation on Policy, 2008) of technology entrepreneurs. In terms of age distribution, 14 of the Nairobi entrepreneurs interviewed were in their twenties, eight in their thirties and one in his early forties. In Nepal, 12 interview respondents were in their twenties and two in their thirties, while in London five were in their early to late twenties, and seven in their early to late thirties. This distribution corresponds to a significantly lower average age than that of Silicon Valley founders, reported to be 40 by a Kauffman Foundation report (2009). Information on ethnicity was not collected. Document review and participant observation during networking meetings, complemented findings from focus groups and interviews. Interview participant profiles can be found in Appendix D, limited in terms of detail to ensure anonymity.

3.3.5. Document Review

Document review was used primarily to establish existence and quality of new mobile applications created by potential interview respondents. Documents examined included marketing and sales materials used to promote new apps, including websites, online app stores, social media platforms, news articles, email newsletters, blog posts, and, where available, financial statements and other operational reports indicating revenues from sales and distribution statistics of new apps. Documents were identified via online search or by the potential respondents. Potential respondents were invited for an interview only if a public record of their application existed, since the aim was to gather information from and about entrepreneurs who had successfully launched at least one mobile application. The documents reviewed can be grouped into four types: a) those that gave detailed information about the mobile app and company behind it, including a link to download the application b) those that were equally rich in data about the app and included a download link, but focused solely on the specific app, c) those that more briefly described the app and its features in the context of a wider offering of competing products, and d) those with only short mentions of the product, which did not provide enough information to establish the usability of the app. Where at least three documents from the first three categories were found, it was concluded that the app could be considered successful for the purposes of inclusion in this study. In some cases, for example with two Kathmandu entrepreneurs and one Nairobi entrepreneur, it was not possible to locate externally available documentation because the apps were used only internally by corporations. In these two instances, I sought to verify the success of the

app by viewing a demonstration of the app's functionality and by speaking with other entrepreneurs about their knowledge of the product and its adoption.

3.3.6. Participant Observation

Participant observation is useful during the preliminary stages of inquiry for exploration and description (Lazarsfeld, 1972; Babbie, 1986). According to Becker and Geer:

Because [the researcher-observer] sees and hears the people he studies in many situations of the kind that normally occur for them, rather than just in an isolated and formal interview, he builds an ever growing fund of impressions, many of them at the subliminal level, which give him an extensive base for the interpretation and analytic use of any particular datum. This wealth of information and impression sensitizes him to subtleties which might pass unnoticed in an interview and forces him to raise continually new and different questions, which he brings to and tries to answer in succeeding observations.

(Becker and Greer, 1957, p. 32)

In order to complement interview findings in the ways described by Becker and Greer (1957), participant observation was conducted in each city involved in this project, at informal meetings such as networking sessions following presentations or workshops, between March 2011 and November 2012. In Nairobi, this included coffee breaks and networking before a workshop on mobile security, held at the iHub in March 2011. In Kathmandu, participants were observed during two informal gatherings of entrepreneurs and developers over tea and meals, and during a three-hour networking evening following a mobile industry conference attended by approximately 200 people, including entrepreneurs, government representatives, telecommunications companies and established local technology firms in December 2011. In London, I attended two events in order to observe networking activities; one of these was an outing at a London pub directly following a panel discussion on different mobile platforms in April 2010 and the other was a networking evening organized by a technology incubation space

over beer and pizza, held immediately after a technical presentation on new Android software in August 2011. In the course of these sessions, I took written notes related to a) the size of the group, b) the makeup of the group in terms of gender and age, c) the sense of familiarity between participants or groups of participants, judged primarily by the way they greeted each other, d) the topics of conversation among participants, e) technical terms I did not understand, f) examples of specific mobile apps or mobile technologies discussed by attendees, g) other interesting or surprising observations. These proved useful not only during the interviewing stages of data collection, but also for providing contextual information to the analysis of results.

3.4. Data Management and Analysis

Prior to each focus group and semi-structured interview, participants' informed consent was obtained. Focus groups and interviews were recorded using a digital voice recorder and the recording software Ecamm. I also typed notes using a laptop computer during focus group and interview sessions and took written notes during participant observation. The recordings were transcribed either entirely manually or with the help of Dragon dictation software. Detailed notes taken during participant observation were typed after each session. Copies of documents reviewed and addresses of their locations on the World Wide Web were stored as Excel files. Focus group and interview transcripts, along with notes taken during participant observation were securely stored and backed up electronically in multiple locations on personal memory drives.

Data were processed and organized using Microsoft Word, Microsoft Excel and Google document processing software. Nvivo Software was considered and tested for use in the study; however, due to the different terms used by individual respondents for similar concepts, and the researcher's inability to predict all of these terms, it was necessary to review each transcript without assistance of software in order to identify relevant codes to be used for detecting data categories and emerging topics and themes. I also experienced multiple stability issues with Nvivo, and as a result, relied primarily on manual coding and analysis of topics and themes. The data was organized in Excel tables, according to the identified codes, topics and categories. This was an iterative process, with new codes and categories evolving as the analysis of transcripts progressed, which is in line with the experience of other qualitative data researchers who find it necessary to develop successive versions of the coding scheme over the

course of the evaluation (Weston et al., 2001).

Principles of case study construction developed by Yin (2002) were used in this process. First, the theoretical propositions were identified that indicated the case study as a useful approach were used to help focus consideration of particular types of data. Second, alternative explanations were considered for any perceived linkages. Third, a descriptive framework for presenting each case study was developed. At each stage, Yin advocates the search for patterns appearing in the data, and using these patterns to build explanations and further theories (2002) and this advice was followed in the study.

Illustrative quotes pertaining to each topic were also entered into Excel tables for further review. Notes from participant observation and document review were similarly examined for topics and contextual information related to interview and focus group data, and findings were added to Excel for overall analysis. Data obtained through the preliminary focus groups was used to inform the creation of the interview protocol for semi-structured interviews. Data resulting from these interviews was analyzed using an inductive approach: first, data were coded and condensed into a summary format; then, the summarized data were examined for connections with the research objectives and these were organized into preliminary findings. Finally, findings derived in this way for each city were compared to one another and analyzed according to the framework presented in section 2.6. The findings were then used to develop a model of experiences of the mobile entrepreneurs interviewed. Information obtained through participant observation was used to provide additional insight into interview data, and, to the extent possible, to triangulate findings.

3.5. Limitations

The study involves a number of limitations related to design, methods, and findings. A principal source of possible bias is a result of the snowball sampling strategy: only individuals who are involved in social networks in the three cities and not isolated entrepreneurs were recruited for the study; however, since the purpose of the study was to answer open-ended questions about the role of networks and specific network types of members in the acquisition of resources by entrepreneurs, on the explicit assumption that such a role exists, the exclusion of entrepreneurs with a solitary working style was not deemed to jeopardize conclusions. The sampling strategy also posed the risk of respondents identifying those very similar to themselves as additional participants. To reduce this risk, effort was made to ensure that women entrepreneurs, as well as a variety of types of startups were included in the sample. For instance, in the case of Nairobi, a networking organization for women in technology was consulted, and in the case of London, two women entrepreneurs were initially invited to participate and asked to suggest other women entrepreneurs. In Kathmandu, respondents were aware of only two successful female mobile entrepreneurs; one of those was interviewed, while the other was not able to participate due to scheduling difficulties caused by her professional commitments.

In addition, background informational interviews were held with persons other than mobile technology entrepreneurs whose activities were related to the industry, but who were not directly connected to the networks from which interview respondents were sourced. For instance, these included two established entrepreneurs in the IT

industry and a professor of computer science in Kathamandu, two computer programming students in Nairobi who were not entrepreneurs, and three employees of startups who were not company founders in London, among others. Participants in these background interviews talked about their own experiences and did not provide information about alternative networks of entrepreneurs or about individual entrepreneurs working in isolation, even when prompted.

Data on socioeconomic status or ethnic group belonging was not collected, limiting analysis related to these questions. Further, the interview respondent group consisted of individual mobile entrepreneurs and those working with one or, rarely, two additional co-founders; some of these small founding teams had hired additional, and usually part-time employees, but no entrepreneurs from companies with more than ten employees were included in the study, and the vast majority were solo entrepreneurs or worked in teams of two. Another possible source of bias is related to the choice of snowball sampling in this study. Specifically, in each of the cities, mobile app competitions and similar events that lend publicity to individual entrepreneurs are regularly held. These events result in increasing the visibility of the winners of such contests among their peer group, making their selection via snowball sampling more likely. This could have skewed the perception of respondents in a way that resulted in an overly high estimate of the role of competitions as sources of funds. However, since no more than two competition winners were interviewed in any one city, this risk of bias seems minimal.

The key to using focus groups and interviews successfully in social science research is ensuring that their use is consistent with the objectives and purpose of the

research. According to Stewart et al. (2006), focus groups are often a useful starting point for the design of more in-depth methods of inquiry because they provide a means for exploring the way potential respondents talk about objects and events, identifying alternatives for interview questions and determining the suitability of scaling approaches; however, focus groups can also introduce bias. Since the researcher tends to act as the focus group leader, and since the focus group leader chooses follow-up questions as the conversation proceeds, researcher bias can creep into results. In this case, the researcher has not had a vested interest in the outcome of the study, which, together with the awareness that bias can occur, should reduce the potential for partiality to occur. To further minimize the risk, focus groups and three initial (pilot) interviews were carried out in the presence of silent observers who were able to point out any apparent direction the interviewer inadvertently gave to the respondent. The silent observers were experienced researchers who were part of my own professional networks. In this case, the observer present during the pilot interviews reported minimal researcher influence over the course of the interviews, which was to keep the respondent on topic, i.e. to shorten answers unrelated to the study.

The semi-structured interview technique used in the main data collection phase relies on accurate and comprehensive answers to questions (Stewart et al., 2006). Since it is known that individuals do not always report their own behaviour accurately (Fontana & Frey, 1994; Stone et al., 2000), it is possible that this affected the data. Given that the topic of this study is not inherently sensitive, except where issues around intellectual property arise, it is reasonable to expect that respondents did not give misleading answers on purpose. In order to strengthen validity and reliability,

some interview questions were phrased to ask not only about the respondent's own behavior but also about that of peers and other colleagues, to encourage more candid answers. Participants were also guaranteed anonymous attribution, except when their permission to be quoted was explicitly granted.

Of some relevance to the study were concerns related to response bias, which causes study participants to respond, whether consciously or subconsciously, in a way they think that the interviewer wants to hear, or in a way that confirms expected findings (Fontana et al. 1994). In each of the three cases, I was acquainted with a small number of the mobile entrepreneurs in professional capacity. Having attended Mobile Monday meetings in Nairobi as a World Bank consultant, and having corresponded with two of the Nepal entrepreneurs by email in a professional context, there was a possibility that my identity as an academic researcher or association with a large international donor organization would cause focus group and interview participants to adjust their responses in some way. In the case of interviews, my World Bank association was known to only a few of respondents in each city due to previous contact with them in professional capacity, while, of course, all interview participants were advised of my affiliation with the University of Oxford in the process of being informed about the study and prior to giving their consent to participate. The respondents were also informed that the research was not prompted or sponsored by any other individuals or organizations.

Documents reviewed (as described above) were primarily applicable to one aspect of the research process – establishing the existence of the innovations (mobile apps) launched by the entrepreneurs and adopted by the market. The documents were

of various formats and quality, some containing detailed information on the apps, such as app store reviews, while others, such as short online news articles, provided merely a mention. Still, the documents were useful for their purpose – confirming, independently of the entrepreneurs, the adoption of the apps by the market.

Results of this study are also limited by the relatively small size of the sample and its lack of representativeness. Conclusions cannot be extended to all entrepreneurs in the mobile sector, let alone in other innovative industries; however, this was not the objective of the study. Finally, since interviews, surveys and focus groups result in self-reported data, some bias is likely to have been present; however, the interview protocol mitigated some of the bias risk, by requesting recollection of specific events. Focus groups and participant observations also provided triangulation opportunities. Moreover, perception is an important factor in motivation, which is one of the subjects of the study.

3.6. Ethical Considerations

All participants were informed of the research study's goals and how the information collected will be used and stored. Focus groups and interviews were only held with participants who have given their written consent adhering to University of Oxford's CUREC guidelines. Participant observation was conducted at public meetings, where consent of the organizers was obtained. Every effort was made to store audio and written recordings and observation notes in secure locations at all times, and participants were never personally identified or quoted unless they have given explicit consent. The names of respondents have been changed, and any identifying details

removed from data. While this helped to achieve external confidentiality, some concern remained that respondents may recognize each other's responses (Tolich, 2004) due to shared experiences and detailed knowledge of each other's characteristics, past behaviours, challenges and accomplishments. This was of particular concern in the cases where respondents received considerable public attention, for instance through winning high-profile competitions. In a small number of such cases, the respondents were contacted after data collection and analysis were complete, to obtain further consent of presenting quotations from their interviews. In one case, this resulted in the removal of a single quote, to respect the respondent's wishes. In this instance, the respondent's concern was not related to confidentiality; rather, the respondent changed his mind about a particular subject, and wished to have his earlier comment omitted from the study.

3.7. Chapter Summary

This chapter has presented the rationale for using networks as the unit of analysis, based on the established relationship between entrepreneurial activity and networking, previous studies with similar methodologies, and the goal of comparative analysis between the three cases at the level of the collective. The choice of a qualitative approach was also explained in the context of case study research, and in consideration of the problems related to defining the boundaries of the relevant networks, which would have been a prerequisite for a quantitative or mixed-method. Next, the rationale for the choice of the city-based cases was provided, describing Kathmandu, Nairobi and London as occupying different points in the development of mobile ecosystems and providing a variety of economic contexts that could help highlight any similarities in the

themes emerging from the cases. Data collection and analysis was described in detail, including the use of focus groups, semi-structured interviews, participant observation and document review, along with the inductive approach to interpretation of the data collected. Limitations, both those inherent in the data collection techniques used, and those particular to this study, such as possible researcher bias and the prominence of app competitions, were also discussed. Finally, ethical considerations were presented, with a focus on steps taken to ensure anonymity of respondents. The following three chapters present data collected and analyzed using the methodology described above.

4. Networks of Mobile Technology Entrepreneurs in Kathmandu

Nepal has long been described as “a yam between two rocks” (Whelpton, 2005, p.37), a phrase originally credited to the first king of unified Nepal, Prithvi Narayan Shah, who is said to have used it in his political testament shortly before his death (Whelpton, 2005, p.37). The “rocks” were China to the north and the British-ruled Indian territories to the east, west and south. While the world has changed considerably since Prithvi Narayan Shah’s death in 1775 (Whelpton, 2005), the phrase has persisted and continues to reflect the lack of power of Nepal relative to its populous neighbours, China and India, and the remote position of the country relative to the rest of the world. Due to a number of related factors, discussed below, Kathmandu’s mobile technology ecosystem is in its very early stages, and this is reflected in the nascent social networking practices among mobile industry entrepreneurs. This chapter presents data gathered through focus groups, interviews, document review and participant observation in Nepal’s capital. The emphasis is on gaining an understanding of the nascent entrepreneurship community through the motivation of entrepreneurs to participate in networking groups and the ways entrepreneurs’ perceive and pursue opportunities available to them via their relationships with others. Values used to describe Nepal’s economy and demographics correspond to the period during which data collection was performed.

4.1. Mobile Innovation Ecosystem Overview

Mobile technology entrepreneurs in Kathmandu live in an environment of contradictions: their country is one of the poorest and most economically isolated in the world, and despite this, their city's information and communications technology (ICT) industry has been experiencing rapid growth (Sutherland, 2011; Shakya, 2007). The juxtaposition of a thriving ICT sector against an otherwise lacklustre economy makes Kathmandu an interesting site for studying a young mobile technology ecosystem.

Nepal's broader economic situation is also paradoxical: its natural resources make for significant potential in a number of areas: the Himalayas provide opportunities for generating abundant hydropower (Jha, 2010) and for realizing substantial revenues from tens of thousands of visitors who spend time each year exploring natural tourist attractions of the country (Agarwal & Upadhyay, 2006); the country's low-lying valleys are also abundant in agricultural resources (Karkee, 2008), including a highly-prized variety of trout with significant economic potential (Nepal et al., 2002); and with a population of approximately 27.5 million people (World Bank, 2012c), Nepal could theoretically sustain a thriving labour force and enjoy a prosperous national economy.

Nonetheless, it is the third poorest country in Asia, surpassing only Afghanistan and Burma in income per capita (United Nations, 2013) and it continues its struggle to overcome the legacy of a violent, ten-year Maoist insurrection which ended a long period of monarchical rule (World Bank, 2012c). A peace agreement between the Maoists and the government, signed in November 2006 marked the end of the civil war and abolishment of centuries-old monarchy (Gilligan et al., 2013), but political

instability has continued to plague Nepal. One example of this instability is the lack of agreement among Nepal's parliamentarians regarding a new constitution and over proposals to divide Nepal into states along ethnic lines (Bhandari, 2014). Economic activity continues to suffer as a result of political uncertainty. One of the most promising sectors in Nepal, the tourism industry, may be thriving compared to earlier decades but it is nowhere near its peak potential (Afram & Salvi Dei Pro, 2012). Most of the population depends on subsistence agriculture, and around 40 percent of Nepalis live in abject poverty (UN, 2013). Foreign aid, at US \$1.66 billion per year (Government of Nepal, 2011) and trade, at US \$4.59 billion (World Trade Organization, 2012a), mostly with neighbouring India, comprise a significant portion of the country's GDP of US \$19.41 billion USD (World Bank, 2012c), indicating a high degree of economic dependence on external factors with potential long-term negative consequences (Kentor, 1998). The country's recent political history, uncertain current economic situation, and relative dependence on a single neighbor—India, influenced the late birth of Nepal's mobile technology entrepreneurship ecosystem, but certainly did not stop the resourceful Nepali startup founders from establishing a flourishing community.

4.1.1. Mobile Industry Overview

The quality and availability of information and telecommunications infrastructure in Nepal varies: many rural areas are underserved, and while the mainly urbanized Kathmandu Valley fares somewhat better, it faces many challenges related to the ageing of equipment and buildings remaining (Muzzini & Aparicio, 2013). The first telephone exchange was established in Kathmandu in 1960. At the time of data collection, there

were only 644,347 land telephone connections (Nepal Telecommunications Authority, 2013). Mobile subscriptions were much more common, numbering 18,137,771 (Nepal Telecommunications Authority, 2013), indicating a mobile penetration rate of just over 65.6 percent (Nepal Telecommunications Authority, 2013). Between 1960 and 2004, the state-owned Nepal Telecommunications Corporation (NTC), also now known as Nepal Telecom, was the monopoly telecom carrier. After 2005, other competing telecom service providers entered the market, including the market leaders United Telecom Limited (UTL) and Ncell, the later of which was the first privately owned telecommunications company in the country (Ncell, 2013). A handful of other registered companies also operate, some entirely privately held, but with negligible market shares (Nepal Telecommunications Authority, 2013). As of May 2013, computer Internet penetration was relatively low: only 24 percent of the population had registered access to the Internet via 42 Internet service providers (Nepal Telecommunications Authority, 2013). Due to a much higher percentage of the population with access to mobile phones than to computers connected to the Internet, mobile data services are increasingly in demand (Ghimire, 2012). Although the growth of the mobile data sector is constrained in part by higher cost of data-enabled mobile devices, prices dropped and mobile data penetration rose from mid-2012 to mid-2013 (Nepal Telecommunications Authority, 2013). By June 2013, the mobile data penetration rate had reached 26 percent of the total population (Nepal Telecommunications Authority, 2013). This growth was seen as very encouraging by the mobile technology entrepreneurs interviewed for the study who aspired to build successful mobile applications for the local market.

4.1.2. Environment for Technology Startups

Availability of financial, technological, and social capital, as well as other institutional factors can significantly influence entrepreneurial activity, as discussed in section 2.2. In Nepal, most institutional resources seem scarce, especially in comparison to those in the world's best known entrepreneurial regions. Due to restrictive regulation, financial capital is perhaps the most difficult resource to obtain for technology entrepreneurs. Besides low levels of personal wealth, which constrain domestic investment, Nepal attracts a relatively small amount of foreign direct investment (FDI), despite recent growth. In the 1980s, the initial years of its economic liberalisation, Nepal received little investment (Pyakuryal et al., 2005). With time, sectors such as tourism, infrastructure and transport have generated a gradual increase in the flow of foreign investment (Sahoo, 2006). FDI grew from under US\$20 million in 2002 to US\$94 million in 2011 (World Bank, 2012d). India has been the largest investor in Nepal for the last two decades (Athukorala & Sharma, 2006), and continues to be the main source of FDI (Adhikari, 2013). A complex regulatory structure stands in the way of many investors. Although most sectors (namely manufacturing, energy based industries, tourism, mineral resource based industries, and agro based industries and services) have been opened up to foreign investors, allowing 100 percent equity or joint ventures with Nepalese investors, bureaucratic procedures continue to act as impediments to financing from abroad (Sahoo, 2006). Further, a few industries in which investment is prohibited remain, including national security; cottage (i.e. craft) industries; personal services of a kind that would normally be performed by self-employed people; and real estate

(Chitrakar & Weiss, 1995). Foreign investment is also not permitted in the following: retail business; travel agencies; cigarette, tobacco and alcohol production other than for export; and a range of tourist related activities, including tourist lodging (Chitrakar & Weiss, 1995). Entrepreneurship is the domain of the Ministry of Cottage Industries, and as such, has been excluded from sectors open to foreign investment to date, although some limited options of investment via India seem to be emerging (Government of Nepal, 2005).

A small number of investment groups aimed at entrepreneurship have attempted to operate in Nepal. For instance, in 2007, a group of prominent Nepali IT entrepreneurs founded Fortune Cookie Ventures Ltd. in anticipation of legal reforms that promised to encourage venture capital (conversation with Sanjib Raj Bhandari, CEO of Mercantile Office Systems). While waiting for regulatory changes, the company planned to operate as an incubation centre in accordance with the government's programmes for business incubation. During that time, a US-based firm, Intelligent Capital LLC, was to provide technical and managerial support while the Rs. 100 million were planned to be invested by the Nepali entrepreneurs. By late 2013, Fortune Cookie had not been able to make an investment and none were on the horizon (Venture Capital Company, 2007; interviews).

Some international sources of potential financing for entrepreneurs other than direct investment exist. The Dolma Impact Fund, managed by an impact investment group established with support for UKAid, promotes sustainable ventures in Nepal (Dolma Development Fund, 2012). It focuses on ecotourism, education, healthcare, water, renewables, ICT and agriculture and has a target size of \$40 million in revenues.

In addition, the International Finance Corporation (IFC) has an investment portfolio in Nepal of \$46 million as of June 2013 (IFC, 2013). Smaller organizations, such as ChangeFusion Nepal, and Project Gazaab, fund “social” entrepreneurship projects with modest budgets and scope (Impact Investment Exchange Asia, 2012).

In 2006, recognizing the need for broader entrepreneurship support, the government established the Business Incubation Program (BIP) under the lead role of the Department of Cottage and Small Industries (Business Incubation Program, 2013). According to its website, the program is “operated using modern management tools [and] envisions to transform innovative ideas into dynamic enterprise for national and global competitiveness.” The BIP describes Nepal’s incubation landscape as follows:

Nepal is devoid of business incubation services. The existing organizations providing entrepreneur development services are primarily engaged either in skill development or business development services. The demand for incubation service appears to be high among graduates and startup businesses. Thus, BIP will target resourceful graduates and/or start-up entrepreneurs with innovative commercial ideas wanting to take up business as their career, ex-trainees of the DoCSI who have innovative ideas that can be commercialized and SMEs/MEs in the growth trap for consultancy services.

(Business Incubation Program, 2010)

Despite such a clear mission, in-country interviews and document review conducted over seven years after the founding of the incubator failed to uncover a single business incubated in the country. Further, although office space and business support may be in principle available to talented entrepreneurs, a visit in 2011 to the 6,000 sq. ft. facility revealed an empty building with no entrepreneurs present.



Figure 6: Photos from the Business Incubator Nepal, five years after opening (2011). The facility was mostly vacant, save for basic furniture and a non-functional power-generating pedaling system prototype in one office.

A small number of non-governmental incubation initiatives do exist. In addition to the above mentioned Fortune Cookie Ventures, which has provided office space to software developers, another local private company, Lotus Holdings Pvt. Ltd. has

provided financing, marketing and R&D and *in situ* support to entrepreneurs (Lotus Holdings, 2012); however, Lotus services entrepreneurs in traditional industries such as the production of carpets, handmade paper and pashmina products (Lalkaka, 2001). Technology entrepreneurs interviewed did not recognize any of the existing incubation services as relevant to their needs. Sunny, an entrepreneur who started his company by working at home in the evenings while attending university, provided this description of the situation illustrating this lack of supporting structures:

We don't have incubators here. There is the Microsoft Innovation Centre but it only deals with MS stuff so it's limited to Windows apps [in terms of mobile software development]. For entrepreneurs [with broader interests in mobile software], I don't exactly know of any entities that are truly helpful.
(Sunny)

Not dissuaded by a lack of formal institutions, technology entrepreneurs in Nepal have self-organized into social networking groups and host ad-hoc events through which business mentorship, technical training, peer learning, and other support activities can be organized. An early, and perhaps the most formalized example of such initiatives is the IT Professionals Forum, or ITPF, founded in 1998 and registered as a non-profit organization in 2000 (IT Professional Forum, 2013). The diversity of ITPF membership is one of the organization's strengths: members come from private, semi-government, government, academic and financial institutions in Nepal. ITPF is also well connected to established government institutions through its participation in the High Level Commission for Information Technology (HLCIT) of the Government of Nepal and its institutional membership in the Computer Association of Nepal (CAN). The Forum's activities consist of research, networking and training: it conducts policy studies on a variety of topics related to the ICT industries and innovation, hosts "Tech Talks" for the

community, mainly on topics related on ICT for development, and organizes technical training in software programming, project management and other subject areas (IT Professional Forum, 2013). The Forum has also been involved in advocacy for business incubation in the agribusiness and ICT sectors. While many of the thematic areas of activity of the Forum are of high relevance to mobile technology, interview respondents noted that ITPF was not specifically focused on assisting startups; instead, the interview respondents spoke about a number of more recent networking initiatives founded by and for entrepreneurs and software developers since 2010, which are more directly relevant to their mobile software ventures. These included the Free and Open Source Software Community, Mobile Nepal, Android Developers Group, Kathmandu Web & Java Developers and Entrepreneurs Group and a number of smaller “meetup” groups. One of the respondents, Vinay, helped to organize many events and recruit new members for the FOSS and Mobile Nepal communities. From our first interaction, it was clear that he was thinking holistically about the development of mobile technologies in Nepal, and that he knew enough about entrepreneurship communities around the world—including in the United States and neighbouring India—to make specific comparisons between them and the local environment. Vinay explained that in recent years, a number of software developers working on projects for established companies in Nepal and abroad, came together to explore how they could stimulate the development of a local market. Many of them recognized the growth in mobile phone adoption and wanted to provide locally relevant applications for their compatriots. Over a relatively short amount of time—fewer than five years—some these developers turned into entrepreneurs, and contributed to a number of initiatives designed to assist fledgling

startups in Kathmandu. This included the founding of a co-working space, training programs and small amounts of initial financing. In Vinay's words,

We don't have anything like in Silicon Valley. But [as of] very, very recently, we have Biruwa Ventures, a coworking space. They have incubated other entrepreneurship support companies. One is Karkhana, they provide training for engineers, and there is a seed fund, Udhyami. They are coming up with some funds for startups but it's very, very little.

(Vinay)

It is worth noting that the terms such as “coworking” are relatively new in even the most established entrepreneurship ecosystems. That term seems to have been first coined by an American games developer, Bernie De Koven, who first used it in 1999 to describe “collaborative work supported by computer and new technologies of the day” (Coworking.org, 2012). However, “coworking” subsequently became more widely used to describe offices shared by technology and creative media professionals. With that meaning, it seems to have been first used by Brad Neuberg, who opened the first coworking space in San Francisco in 2005 (Coworking.org, 2012). Since then, the notion of technology entrepreneurs using a common office for coworking has been exported to various entrepreneurship ecosystems around the world. It has been described as a global movement (ImpactHub, 2013) with dedicated spaces appearing in many cities around the world and a number of franchise businesses capitalizing on the trend (for instance, ImpactHub and Regus).

In addition to organizations and facilities that support entrepreneurs, another important factor for the success of an entrepreneurial system is the availability of human capital, or a technically skilled labour force (Mercan & Göktaş, 2011; Durst & Poutanen, 2013). Some highly skilled workers will become entrepreneurs themselves,

and they will become reliant on their ability to hire other skilled programmers as their businesses grow. According to the IT Professionals Forum, Nepal produces approximately 4,000 IT graduates each year (2012). Of these, approximately 500 are software engineers (ibid.). Many of the IT graduates choose to build their careers abroad, but some have decided to stay and to start their own companies. Local software programmers have founded several firms, including D2Hawkeye, Mercantile, WorldLink, Serving Minds and Yomari, that have grown to create hundreds of jobs. The majority of local software firms focus solely on outsourcing their services to companies abroad, often in India, the United Kingdom or the United States, due to a lack of demand in underdeveloped local markets (Ghimire, 2012; interviews) and the restrictive regulation that has made financing necessary in the growth stages of a new firm difficult to obtain in Nepal.

Nepal's comparatively late development of modern communications technology and infrastructure, and its long isolation from the global trade and knowledge exchanges outlined above, have created an opportunity to study a mobile software entrepreneurship ecosystem in an early stage, at a time when similar systems in other countries have reached a much greater degree of maturity. The remainder of this chapter is devoted to entrepreneurs' motivations for networking, the risks involved, and the more general observations about the mobile ecosystem made by study participants.

4.2. Motivations for Networking

All interview respondents in Kathmandu indicated that they turn to their networks to obtain at least some types of resources. Interestingly, seven respondents relayed that

they had worked in near-isolation for some time—in one case, many years—and had outsourced their skills to foreign customers directly. Like Vinay, a number of other respondents explained that they recognized demand for local mobile software in Nepal and considered founding a company, and some had gone as far as making sketches or prototypes of possible products. Arjun, a software developer who waited for nearly a decade to take the plunge and leave his corporate job to devote all of his energy to his venture, said that he was very uncertain whether he would be able to start a profitable software business in Nepal, and especially one serving the local market. Since there were no regular informal gatherings of mobile software programmers, let alone a prominent community of entrepreneurs, many developers like Arjun were not aware of other programmers in Kathmandu who were in similar situations and who had the potential to offer advice and support. Vinay also indicated that the problem of isolation was acute, and that it was one of the reasons he volunteered to help a local organization, Young Innovations Pvt. Ltd., to organize informal networking evenings for students and professionals interested in mobile software. The events started in 2010 under the name “Mobile Nepal,” and since then, dozens of participants have met, shared advice and resources, tutored each other and even founded businesses together. They also discovered that there were others just like them, working at home on software projects they hoped to someday launch. Akash, who was one of the focus group participants as well as an interview respondent, said that he had been completely unaware of the existence of a number of Mobile Nepal members, some of whom had become invaluable advisors and a source of support and friendship since the network’s founding. Nearly all focus group and interview respondents had participated in Mobile

Nepal gatherings, and some were involved in starting similar associations. Sunny, one of the most active student members of Mobile Nepal, said he particularly enjoyed telling new students with entrepreneurial dreams about the network since it made him feel like he was bringing the others good news. He described the makeup of the networking organization this way:

[Mobile Nepal] is like a platform to learn, people come and share what they do. It's a mix of computer hobbyists, students, business-minded [people]. They all come together every few weeks. The primary thing is finding people who share similar interests and goals because otherwise you feel like maybe you are crazy.
(Sunny)

He added that finding others “who share similar interests and goals” creates a sense of belonging, without which entrepreneurs question their entrepreneurial instincts and judgment (“otherwise you feel like maybe you are crazy”). This sentiment was expressed in a vast majority of interviews in Kathmandu, and most interviews in Nairobi, as the next chapter will show. The sense of belonging seemed to be achieved through a combination of many factors, and it was often difficult to separate one from the other. Vinay explained that Mobile Nepal serves two main purposes: educating entrepreneurs as well as creating a sense of belonging.

The idea of entrepreneurship is foreign for most people in Nepal. So, for the few people who want to take a risk and want to do entrepreneurship, it is so important to have a community of like-minded people who can learn together.
(Vinay)

Perhaps the most striking aspect of interviews in Kathmandu was the strong enthusiasm entrepreneurs expressed about participating in networking groups. They reported perceiving a number of specific potential benefits of networking, some of which they consciously sought to find, along with some others that were unexpected but

nonetheless important motivators to continue engaging in social networking activities.

4.2.1. Sense of Belonging to a Community

As already mentioned, the most frequently cited benefit was achieving sense of community in which one can find peer support and encouragement. It is worth exploring this point in more detail, as it has turned out to be one of the key findings of this study. Fourteen (out of a total of 19) participants named this type of peer encouragement as crucial in the decision to start their own business. The support was described as a feeling of a “community that understands me” and a “group of like-minded people [with whom] to share what I’m working on.” This was in sharp contrast to the reactions of friends, family and colleagues, who often questioned the idea of giving up a steady job to embark on a risky entrepreneurial venture with a low likelihood of success. In other words, entrepreneurs reported that networking allowed them to create a sense of belonging to a community with shared experiences, made up of members who understand each other’s problems and celebrate each other’s successes. This resulted in a sense of personal validation and added to the confidence needed to start a business.

Neeraj was one of the youngest respondents, and had developed a popular application while still in university. His participation in networking events influenced his decision to pursue entrepreneurship as a career despite pressure from his family to opt for a more established path. He summarized his involvement with the mobile networking groups:

At first, I was using online forums and Facebooks [sic.] for help, and then I attended one programming event of Young Innovations; it was an Android training; through that, I got connected in the mobile community. I found many developers I never knew before then. I found some friends. We shared our

experience and talked [about] how we developed our ideas into apps. I'm a student now, I have developed an application [...] but I want to start my own company based on that.

(Neeraj)

Binod, who also reported that participation in networking contributed to his resolve to try his hand at creating and launching a mobile application, expressed a similar sentiment about the importance of friends and mutual experiences, and said: “sharing – that’s a big thing.” Akash also mentioned that other entrepreneurs are more likely than other people to offer constructive feedback he can build into his work; in this way, community members can amplify the success of an individual project by talking with one another and offering advice for improvements. Thus, in addition to providing empathetic support and encouragement, it would seem that the community can take on chameleon-like properties and turn into a group of test users or technical advisors, as necessary.

In addition to benefiting personally from participation in the community as Kathmandu respondents frequently described networking groups, informants felt that the social events, including hackathons, workshops and other meetings were important for achieving the higher goal of building Nepal’s entrepreneurship ecosystem. Thus, their motivation was not solely acquiring various types of resources for a particular project, but also contributing to the development of the ecosystem for everyone involved, and for future generations of entrepreneurs. In this context, a number of respondents expressed a sense of duty to give back to the community and volunteered their time to organize the activities such as workshops and “meetups” and to recruit new members. Beyond increasing the number of people involved, entrepreneurs felt that the community’s ability to create role-models and provide space for sharing experiences,

successes and challenges were crucial for the long-term development of the ecosystem.

Vinay put it this way:

I am one of the volunteers for the community. We reach out and approach people, create events. [...] We go to universities or other places where developers might spend time and make presentations on what it is all about. That way, the ecosystem is prospering. The most popular events are when we have a successful business speaker. That is motivating. The second most popular activity is sharing experiences. That is encouraging. Within a few years we will make serious progress.

(Vinay)

Binod, who explained that sharing was an integral part of the communities he helped to build, clearly articulated his motivation for participating in networks as a way to exert influence over their very evolution: in his case to promote a value system embodied by the open source movement:

I am an open source evangelist. I'm into sharing things we've been learning as a group. Sharing is important to me. I encourage open source because I have benefited from it personally and I have been able to build software that helps people. I spent five years hacking software. Proprietary systems don't give us codes to hack into. You can really contribute to society with open source.

(Binod)

In addition to the broad goals of achieving a sense of belonging and influencing the wider context in which they work (whether by carving out a safe context in which to pursue entrepreneurship, or by institutionalizing a set of norms, such as sharing), entrepreneurs also turned to their community for very specific resources for their businesses. The data from responses related to non-subjective resources obtained through networking groups generated four categories of resources: knowledge (about entrepreneurship and technical topics relevant to the business), labour, financing, and broadband Internet. It is worth noting, however, that even when discussing these specific inputs, Kathmandu respondents often used the word community and returned to

discussions of the impact of the gatherings on the overall environment for mobile entrepreneurship. Together, these forward-looking responses painted a vision of a thriving ecosystem. Interestingly, as subsequent sections will show, shortcomings were frequently mentioned through comparison with Silicon Valley. Other regions, including the UK, Germany and India, were also occasionally mentioned, however, the frequency and consistency of references to Silicon Valley and the San Francisco Bay Area (whose southern part Silicon Valley occupies) indicates that this region, famous for technology entrepreneurship, was strongly influencing the vision of a future mobile ecosystem in Nepal. Before discussing these comparisons, let us consider the specific resource types sought by Kathmandu entrepreneurs.

4.2.2. Knowledge: “What to Do, What not to Do”

Eleven respondents cited learning as an important reason for participation in the community. The knowledge obtained through networking was seen to be complementary to university courses. Formal education was sometimes described as incomplete or out of date. Srijan, a recent graduate, dismissed university courses as a source of knowledge specific to mobile software development outright:

The first motivation is to learn. In Nepal, we don't have mobile software courses like in the US or UK or India. You learn by experience and self-study.
(Srijan)

However, Arjun unknowingly contradicted the above statement about the lack of mobile software courses in tertiary education institutions, and mentioned he was about to start teaching one. This inconsistency seems to be the result of the first entrepreneur's lack of awareness of what was a brand new offering. While a direct causal link between mobile networking activities and the availability of the new course cannot be made with

absolute confidence, it seems likely that initial discussions about the need for such a course occurred during a mobile networking meetup. In addition to acquiring technical skills and the ability to build better products, respondents also said that learning boosts confidence and improves the ability of entrepreneurs to make business judgments. In this sense, the following words by Pramod, a recent entrepreneur, are representative:

Startup Weekend was a great experience. It was 40 hours [long], and you work a lot. For almost 20 hours, we programmed continuously, and learned a lot from it, not only about IT but about business. That's where [the team] got all the info about entrepreneurship and now we're running a business. We even launched a product, in just 40 hours. It's not fully complete but the main features are already live.

(Pramod)

Akash also commented on the benefits of receiving a mix of technical and business training via his networks:

Many people are trying to learn by themselves [...], most of them don't know there is a mobile apps community. I get a lot of hard and soft skills – programming and how to make a business sustainable and how to launch your mobile products in the market [from the community].

(Akash)

In addition to being a source of general knowledge, events organized by the community offer members a chance to practice their existing skills and improve their products. For instance, even entrepreneurs who have been successfully running their own software businesses for a time, can benefit from participating in events such as hackathons, which provide a chance to practice their skills in ways they would not do otherwise. Milan, another entrepreneur who had recently launched his app-business after graduating, emphasized the specific value of learning from peers:

I had a big fragmentation problem - I was having difficulty making UI [user interface] data, and I was confused how to approach it. One of my friends, who is in the community also, showed me how do it.

(Milan)

Finally, another type of knowledge, involved in idea validation, or the ability to discuss potential shortcomings of new products and business models, was cited by 11 respondents as a direct benefit from interacting with one's network. Validating ideas through sharing information with one's network was a necessary part of the innovation process, according to Akash:

Innovation is nice, but how do you know you're not reinventing the same wheel if you don't share?

(Akash)

Tenzin, the only female software entrepreneur interviewed, felt that idea validation was particularly important at the early stages of product development, before too much time and effort is invested:

I like [attending] the meetups because I can make a draft [for a mobile software product] and the community gives me advice: what to do, what not to do.

(Tenzin)

She found this kind of advice especially valuable when she was doing something she had not done before, like writing an app for a new platform or for a completely new audience.

Feedback at later stages of product development was also given. In sharing his experience with receiving help from the network, Binod also referred to the changing role of the community according to need, mentioned above:

I made an app called [Snap-Drop], for Android. It was just a simple app that worked well. I showed it to the community at one of the meetings. They immediately gave me a couple of [pieces of] advice. Community members act

like testers before making [the app] public. Now I'm working on adding some features the users asked for.

(Binod)

Although this type of idea validation or product testing isn't without risks, as is reported in section 4.3 below, as well as in the Nairobi and London cases that follow, the interview respondents spoke mostly of the benefits they gained.

4.2.3. Labour: "The Fact It's a Community Means They're Motivated"

In addition to ideas, networking groups were also found to serve as a source of labour.

Arjun, an established and repeat entrepreneur, linked the two:

[One] aspect are the ideas you can hear in the hackathons. If they were brilliant, we can pick them up, along with the developer.

(Arjun)

Vinay described the value of the community mostly in terms of providing up-to-date programming skills to the pool of potential co-founders and employees:

As you know, there are many people in Nepal who are technical. Many young graduates are searching for their first job. Finding a candidate is easy, training them is hard. A community like Mobile Nepal has a good contribution [in] creating valuable, skilled, good developers. Myself and my business partner have done some presentations to help new graduates and students to learn mobile development. Mobile Nepal really helps in those circumstances, not just our company, but for overall training of the fresh batch of developers.

(Vinay)

It may not be surprising that entrepreneurs who are looking for co-founders or their first hires will keep an eye open for potential employees everywhere they go, including networking events; what sets such events apart, according to respondents, are the high levels of self-motivation and enthusiasm of attendees. Participation in competitions or in events that are inconveniently scheduled was seen as an especially strong signal of self-motivation in potential employees. Arjun explained this logic, although as the following quote shows, the remarks are difficult to separate from the enthusiasm for the

community:

For me, the community has been working as a source of partners and friends; a place where you could find a good partner. The fact it's a *community* means they're motivated by themselves. If I need a partner for an idea, the only other way would be to place an ad in the newspaper, but that doesn't make sense because I would like to have someone motivated; if someone is coming on Saturday to events, she is obviously self-motivated; so I would rather get that person, than the one who responds to the ad.

(Arjun)

Related to this was Vinay's sentiment that someone who participates in a networking event focused on mobile entrepreneurship is likely to have a greater awareness of the uncertainty involved in working in a startup compared to other potential employees; for this reason, he prefers to source employees from mobile entrepreneurship communities:

There are outsourcing websites, where companies post advertisements; as an entrepreneur, you can post there but you may not get the right person who wants to work in a startup, because it's not reliable. Communities are better. Quite a few [entrepreneurs] have come to meetings asking for help for their company.

(Vinay)

This comment once again takes us back to the sense of belonging to a community discussed earlier: in this case, the source of the sense of belonging is the shared understanding that a startup is a risky, yet worthwhile endeavor. Entrepreneurs look for employees who "get it," and networking groups are likely sources of such potential hires; outsiders, it is presumed, are less likely to relate to the founders and other team members, and are less likely to be prepared to take the risk of giving up traditional employment in favour of a startup job. Milan reinforced the sentiment, and said that the Internet was only a secondary source of labour, used only in the event that community channels do not prove fruitful:

If you don't find anyone [through your networks], then you look online, for example, at jobsnepal.com.

(Milan)

Related sentiments about the Internet as an inferior source of inputs are described elsewhere, particularly in the context of knowledge acquisition, both in this chapter and in the case of Nairobi (recall, for instance, the comment above that “Facebooks” were used to look up solutions to problems, before the mobile community came along).

4.2.4. Financing: “Invest in Ideas”

Financing was named as another potential benefit of networking, but it was found to be much more difficult to obtain than labour. Only nine, or half of the respondents, indicated they felt pursuing financing through their networks was worth a try, with the remainder choosing to “bootstrap” (self-finance) their business or to apply for bank loans. Sunny, a student entrepreneur who has built and launched multiple apps into the Nepalese market said he has had to “bootstrap” not because it was a strategic choice but because of the lack of investors in the community:

If I have an idea, if it's good enough and presents something, it will be given some assistance so it can be turned into a product. What we are lacking in our community is someone who wants to invest in ideas. We lack such persons, investors.

(Sunny)

Most respondents said that availability of capital for early-stage companies was extremely low, and that even the existing opportunities were not well publicized. Binod went so far as to say the lack of funding was so severe it negated all of the other positive developments, including the emergence of a community of developers and entrepreneurs:

Once the hackathon was over, the idea fades out because there is no investment.

So it's like there is no ecosystem. So we are helped technically, but it's hard to make that idea into a business [without financing].

(Binod)

Two respondents dismissed the prospect outright, indicating that fundraising was the most difficult hurdle for entrepreneurs in Kathmandu due to the general lack of investment capital. Milan was one of the nine who did pursue investment. He explained that his startup had been financed with a number of small personal loans.

For finance, [...] I didn't have a lot of savings, so I took a lot of small loans from friends and family. And I have been paying them off slowly.

(Milan)

It should be noted that most of the comments about the lack of investment were made unprompted, usually in the context of discussing the community that meets during various networking events. Neeraj felt that bringing more investors to the events was the next challenge:

The community has been good as a source of partners and friends. But now I would like to meet the VCs, business people who would invest.

(Neeraj)

While the lack of financing was the topic about which respondents in Kathmandu seemed most concerned, this did not seem to detract from the forward-looking perspective and the understanding that building a functional mobile technology ecosystem was a joint effort by the community members. A small number of interviewees expressed hope that some of the established entrepreneurs will take a chance on opportunities created by a new generation of tech startup founders, while two others said that bringing investors in the real estate industry to tech meetups could spark

their interest in mobile software.³ Some additional observations related to this point are presented in section 4.4. below.

4.2.5. Access to High-speed Internet: “Makeshift Hackathons”

In addition to financing, another resource that was reported to be in short supply was high-speed (broadband) Internet access. High-speed Internet was mentioned as a key resource in itself, along with being named as a conduit for obtaining knowledge, labour and financing. It was also brought up in the context of discussions about “load shedding”—scheduled electricity outages that reduce overall use and relieve pressure on the power grid. Most respondents said that they relied on family or personal subscriptions for primary means of Internet access, meaning that they did not need to count on network contacts to get online. This ability to access the Internet with relative ease by most respondents also means they are the minority of the Nepali population, since under a quarter of Nepalese have direct computer access to the Internet, as mentioned in the opening pages of this chapter. Despite this, many respondents indicated that they spend time working and connected to the Internet in universities, at friend’s homes or during networking meetups, such as competitions or hackathons. Access via family and friends was reported to be preferred to other sources due to the fact that coding, which frequently involves accessing the Internet, could be carried out over uninterrupted long periods of time and at odd hours, for instance at night. Srijan explained that there are few public places where this kind of work could be done:

There aren’t too many places where you can spend a very long time coding, so unless you have reliable internet at home, you have to work in chunks. [A

³ After data collection for this study was completed, it became known that one of the entrepreneurs and organizers of Kathmandu’s mobile networking activities had made modest investments into some of the startups founded by community members; however, I was not able to obtain details of the transactions.

friend] has a great broadband connection, and a generator. We used to regularly get together at [the friend's] house for, sort of, makeshift hackathons overnight.
(Srijan)

Interviewees also indicated that networking groups played an indirect role in obtaining access to high-speed Internet. Community members often advised each other of places where broadband connectivity was available; this sometimes resulted in members co-working in each other's homes, in traditional institutions such as universities or temporary co-working spaces such as offices of non-governmental organizations outside of business hours.

4.3. Risks of Networking: "Risks Exist but You Can Manage Them"

Two risks of participating in networking activities were identified by Kathmandu interviewees: idea theft, cited by five respondents as a concern, and loss of time, mentioned by three entrepreneurs. Risks were identified by seven respondents, four of whom saw idea theft as the only risk, one of whom perceived loss of time as the only risk, and one of whom who identified both of these risks. The remaining twelve respondents in Kathmandu did not mention any risks of participation, even after being prompted.

4.3.1. Idea Theft

Most of the mentions of idea theft occurred in a very specific context: immediately after Startup Weekend (a business competition held shortly before interviews were conducted), the top team was stunned to learn that another competing group had registered the domain name the winners had intended to use for the business as soon as it was announced, with the intention to build a 'clone' of the winning startup's product.

Neeraj respondent described the situation as an illustration of risks inherent in networking events, or at least in competitions such as Startup Weekend:

There are risks to open up completely in such a community; [members] fear their ideas might get stolen and someone else might start what they're thinking. This recently happened in Startup Weekend Kathmandu, the winner, [Acquaintance.com⁴], won the title, and one other group participating in the event registered the domain and later tried to work together with the winner. After many conversations, it seems that they stole the domain name when winners were announced.

(Neeraj)

Referring to the same incident, Binod said that such behaviour was itself risky and that the company attempting to clone the original idea was paying the price for betraying the spirit of the competition by being shunned by the community as dishonest:

If tell my idea [to the group], everyone will know who is the originator. There's a mass of people who know you came up with something new. They will shun the thief. Sharing gives safety.

(Binod)

Two respondents acknowledged that risks of idea theft must be weighed against one's own ability to implement the idea, suggesting that sharing ideas is only risky in very early stages, when no practical work has been done. In that context, Pramod said:

Of course there is a risk. Did you hear about what happened in Startup [Weekend] Kathmandu? You have to have the potential to implement -- 90 percent [of success] depends on that. You have to be sure.

(Pramod)

The other respondent who weighed in on this topic, Akash suggested that having an idea and having the commitment to put in enough effort to implement it were two

⁴ Names of startup companies have been changed to preserve privacy.

different things, and that a copycat must possess both in order to effectively pose a risk to the original idea author:

I've never heard of someone actually stealing an idea successfully. If you're passionate, you don't need to be afraid: you will take it to the next level; there is very little chance someone else can hear your idea and do it better and faster than you can.

(Akash)

Srijan explained that he manages the risk of sharing ideas at an early stage by limiting disclosure:

Risks exist but you can manage them. Whenever you post something in the online discussion group, you don't have to give details. I simply state I need a developer and briefly explain the concept. It's just like advertising, no more or less risky.

(Srijan)

While some participants believe that the risks of idea sharing can be managed, others are more skeptical. This poses a challenge for the community, as Vinay explains:

I run an open community online. There is one guy, I asked him if he posted any ideas. He said: "How secure is the idea that I'm going to post?" I replied: "This is an open platform, anyone can access your idea, similar to Startup Weekend." So he was very reluctant to post the idea after hearing that. I think he had a good one and we are trying to encourage such people but there has to be a [favourable] cost-benefit [outcome].

(Vinay)

4.3.2. Loss of Time

A different type of risk is related to loss of time. For entrepreneurs with growing businesses, time spent at an event in which no valuable learning is shared may be seen as time wasted. This perception may be more applicable to advanced entrepreneurs, and

in particular, those members who may be able to act as mentors to others. The following quote is illustrative:

I would like to meet experienced developers and entrepreneurs who can help you, but some of the more experienced business people don't think it's valuable to participate in group events. For them, it can be a waste of time. As a community, we should show them that people are helpful and skilled.
(Tenzin)

Jay, a more experienced startup founder concurred:

Some events aren't fruitful; they try to have programs for everyone, so not everything is relevant to me.
(Jay)

It is notable that only two risks were cited by Kathmandu respondents, and only by a minority of respondents. As the next chapters will show, more Nairobi and London entrepreneurs identified more risks inherent in networking, and seemed more concerned about them. One of at least three factors—or some combination of them—might explain this relative absence of observations about risk: one, that the network in Kathmandu has not been around long enough for risks to become evident; two, that the community is more supportive and collaborative than those in Nairobi and London, and that the risks are thus objectively more negligible; and three, that respondents did not feel comfortable discussing risks, i.e. negative features of the community.

4.4. Kathmandu Ecosystem Characteristics and Barriers

Kathmandu respondents made many important observations about their ecosystem that were not directly, or at least not singularly, related to obtaining resources. Nonetheless, these comments provide important contextual information for the analysis of the results presented above. They have been grouped into three sections, covering 1) the

compounding effects, and the non-linear evolving nature of the mobile tech community, 2) entrepreneurs' recommendations for improvement, and 3) systemic challenges for the mobile tech ecosystem that the community is unlikely to be able to solve without significant involvement of institutions, including the government.

4.4.1. The Compounding Effects of the Evolving Mobile Tech Community: "Before, There Was Nothing"

One notable finding in the data collected for this study is the fact that motivations for participation in networking groups were rarely, if ever, described independently of each other. In other words, nearly all respondents felt that there were multiple, related, and mutually-reinforcing benefits to participation. It was also apparent that participants had the ability to "pick and choose" benefits that were most relevant to them personally.

Milan pointed out that each member is unique when it comes to the set of motivations that compels him to participate:

Different people come to network for different reasons. If I'm a newbie, I prefer to attend classes or more structured events where I can learn. If I'm more experienced, I'm probably working already during weekdays and can only make it to events on weekends. If I have a startup already and it's not just at the idea stage, I want to meet the VCs, business people who would invest.

(Milan)

Pramod described the variety of benefits he has received by participating, and pointed out that the community was the source for all members of his team:

The network can do so many things. For my case, an idea was presented by a Google developer. He needed some Android developers, so I joined his team and we created an Android application. During this time, I learned a lot. In the end, we had seven members of the team: web developers, engine optimizers and business people, all came from the same community. [...] Eventually, inspired by this experience, I started my own company.

(Pramod)

Entrepreneurship networking groups were also reported to be evolving. When initial research for this project began, there was little activity in Kathmandu by what could be described as an entrepreneurial community. During the focus group held in late 2011, one entrepreneur said:

It's hard to sustain a company, because we don't have a link or contacts to the people we need. There is no ecosystem, no financing, no customers. I hope to someday help create a Nepali market and to sell my apps here and abroad. But for now, it's not really possible at a scale that I would like.

(Kathmandu Focus Group Participant)

In the subsequent two years, the situation changed considerably. Recognizing that more citizens were now using mobile phones, and with the aim to provide locally-relevant apps to this growing market, some of the startups had joined efforts to create a Nepali app store. Milan relayed the following:

We have had to create our own market. I'm working on the Android market for Nepal [mJhola], especially for Nepal. Jhola means market. I had built apps before but I started this project during StartupWeekend. I talked with partners at [Exclamation Development] and we started the project. It's a result of the network.

(Milan)

While interviews conducted in 2013 revealed many remaining sentiments about the lack of a functional entrepreneurial ecosystem, respondents implicitly or explicitly portrayed an environment that had changed for the better. Akash recognized this change explicitly and provided examples of its substantive effects:

Before there was nothing, but now [in 2013], there are many events, it's hard to choose which one to participate in. PIVOT Nepal has great prizes. This is the first time we have an event in Nepal with that type of cash prize. There will be only 15 ideas selected, but we have 40 ideas already just from our own company – the prize money is rare and that is attractive.

(Akash)

Beyond occasional prize money, however, respondents reported a continuing and severe lack of financing:

Mobile Nepal was among the first, and it has been running for a couple of years; people come and go; now, a couple of other programs are more focused on community startups and they invite more VCs. What all this community networking has changed is that people are starting to form their own companies and to work for themselves; at the same time, people are not yet ready to leave their jobs. Personally, working for a big IT company in Nepal, I couldn't leave now to start my own startup, even though I would like to, because there is no funding. VCs are needed right now, so that the passion software entrepreneurs have can be converted into business; there aren't many examples of successful entrepreneurs: we need more examples. The community should be more focused on finding VCs and showing examples.

(Srijan)

In other words, there is little support for companies beyond the earliest stages and entrepreneurs such as Srijan depend on jobs with established corporations to cover their living expenses while they contemplate building their own company. Growth financing was reported to be particularly difficult to obtain. For Neeraj,

The problem is with growing a company – there is very little financing. We also don't have a lot of experience with pitching to VCs.

(Neeraj)

The specific references to venture capital (VC) are somewhat surprising, in an environment where foreign investment in startups is very difficult due to restrictive regulation. Despite this, multiple entrepreneurs spoke about VC firms as if it were self-evident that they were an integral part of a functional entrepreneurship ecosystem. The references to “pitching” revealed familiarity with the process startups in other regions of the world use to market themselves to investors.

It was somewhat surprising that smaller grants which could be provided by the government, international organizations, or private individuals (such as angel investors) were not brought up; this was a peculiar result because the latter types of financing normally result in no, or at least a smaller, loss of ownership of the company on the part of the founders, and because venture capital tends to be associated with more developed financial markets than that of Nepal. However, the shift by entrepreneurs from discussing a general lack of financing to speaking about the specific lack of venture capital may indicate an increase in sophistication of the entrepreneurs and the ecosystem to the degree where the absence of financing for early stages of growth has emerged as a particularly acute problem, and one that the networking community was having particular difficulty solving, despite various complementary and compounding effects on the ecosystem.

Overall, networking groups were described as the points of focus for the development of an entrepreneurship community. Vinay offered the following anecdote:

The Mobile Nepal community is important. In developing countries like ours, it isn't obvious where to go for help. For example, a guy who started a company needed an iOS developer for his work. He heard about the community and came to meetings. Slowly, he was able to connect with different developers. Unfortunately, he still hasn't been able to get the right person for his work but we are all trying hard to help him find the right fit.

(Vinay)

According to respondents, community leaders and mentors served particularly important roles for this centralization function. Pramod spoke about the demand and supply of mentors in Kathmandu, as well as the perception of their availability by the community:

We have a lot of good entrepreneurs who could be mentors, many more than we admit in conversation. At StartupWeekend, I was surprised to see most participants were actually successful businessmen; for me it was exciting because they were mentors sharing their experience; that's very advantageous. At another event, PIVOT, we will have a month of coaching and mentoring.

(Pramod)

Finally, networking groups seem to be acting as new types of entities via the events they organize and technology hubs they maintain, and they facilitate direct contact with established institutions such as telecom operators and government agencies, including individual ministries. Milan said:

We barely know the people in the big organizations. If we had some projects together, that would help; for example, we could do some projects for telecom operators, like crowdsourcing, or we could work on solving a problem for the Ministry of Health and Population. [...] To reach them, you have to ask your contacts for an introduction. [...] Usually, it's easier if you meet them at conferences or hackathons or [other] events.

(Milan)

Thus, whether by creating direct opportunities for entrepreneurs to meet representatives of established institutions, or by indirectly linking entrepreneurs to them via third connections, the networking groups seemed to be increasing interaction and allowing greater information flows between very different types of entities in the mobile technology ecosystem.

4.4.2. Room for Improvement: "Solving Our Own Problems"

Kathmandu entrepreneurs had many ideas on how the ecosystem in Kathmandu could be improved, and many of those related to networking, revealing both a joint vision of the future of mobile tech entrepreneurship and a passion for working together to realize it. The responses ranged from generally optimistic ones to more nuanced opinions.

Vinay made the link between the community's ability to resolve its own technical

difficulties experienced by individual entrepreneurs and the changes in the overall landscape for mobile commerce in Nepal:

About [mobile commerce] payments, it wasn't possible before, but as of recently, [NPSOft], the company which focused on [developing a] payment gateway has developed an app that lets us to pay online. You see, we are solving our own problems.

(Vinay)

Despite the generally positive sentiments related to the future of the mobile innovation ecosystem, two interviewees felt it was important to providing better incentives for participation in this effort, chiefly to more senior entrepreneurs who could act as mentors, along with investors and other key actors, such as mobile network operators (MNOs). One of these two interviewees, Tenzin, said that community members look for a tangible benefit to their participation, and that this benefit should be explicitly communicated by the organizers:

Incentivizing the community members for participating in events is important. Those who are actively participating or organizing need strategies to incentivize others, to be able to clearly say, "here is how you [would] benefit."

(Tenzin)

Akash noted that continued effort was needed to ensure the community remained active and that new members were being attracted regularly.

The community is a bit stagnant now – the same people show up. We have many IT colleges and departments who have vast knowledge, but those never know about events; only a few people know. A lot of students and faculty miss out.

(Akash)

Neeraj expressed the need to attract more seasoned developers and entrepreneurs to community events, to allow for less experienced members to benefit from their mentorship.

During Startup Weekend, we learned a lot from our senior brothers. We need to find a way to get them to more of our gatherings.

(Neeraj)

Other respondents also expressed that there was a relative lack of mentors for nascent entrepreneurs, which could be a result of recent growth in the number of people who are considering entrepreneurship as a career option. In other words, there could be many more new entrepreneurs than established ones who could act in advisory roles.

Alternatively, the reason could be that the established entrepreneurs are simply uninterested to act as mentors and advisors. Jay, a more experienced participant, described his own lack of incentive to participate in community events in this way:

My experience [as an established entrepreneur] is mixed. The value of the last hackathon was zero. If I were a new developer, I would learn a lot, but now, later on, I'm running my company. I'm busy. You have to look for a return. For the beginners, the junior developers, it's exciting, they will learn a lot; but for an established company, the benefit is not clear. In the upcoming NASA hackathon, for example, there is not much return, we may not participate.

(Jay)

The fact that the association with NASA, i.e access to NASA data, was not incentive enough, i.e. was seen as nothing special by this entrepreneurs, adds to other evidence discussed in this chapter that the Kathmandu community is globally connected and has access to such resources through other means. Vinay suggested that persuading senior members of the community could be done by emphasizing the exclusive opportunity for them to speak with representatives of big technology companies.

The other thing is getting support from big names, like Nokia or Google, or Apple, or Microsoft; the name itself gives people this "Wow!" feeling; there must be something going on that might be helpful for us. That is important. Even government can't ignore an event where you have these VIPs.

(Vinay)

The ability of globally known technology firms to attract attention from a variety of actors important to the development of the local entrepreneurship ecosystem helps to explain why references to Silicon Valley references are used by local entrepreneurs to promote their activities.

Interestingly, as the next chapter will show, a nearly identical comment was made in Nairobi, in the context of explaining that VIPs can be very useful to draw a variety of actors out to an event, regardless of any value the VIP might bring independently. The issue of government involvement came up in a number interviews; in particular, lack of up-to-date regulation was seen as a barrier to development of the mobile app market in Nepal by many respondents; however, some participants reported that the community had a role in finding ways to circumvent regulatory challenges. As Pramod explained,

Mobile network operators are in the way due to lack of regulation. It's hard to convince them [about mobile banking]. Instead, after one of the events, we are partnering with a payment gateway; they're in the initial phase. We'll work together on how we can enter the market. We plan to target young people and start slowly.

(Pramod)

The discrepancy between regulation and business models based on new technologies is neither a new phenomenon nor one confined to particular countries (see, for instance, Mueller, 2002 and Drezner, 2008). The community's role as a way to circumvent structural inadequacies in the entrepreneurship ecosystem can be gleaned from many of the observations presented throughout this chapter, but it is important to note that this is a conscious process, as this section has attempted to show. Not all of the challenges can

be circumvented, however, and the following pages relay some of the frustrations felt by the entrepreneurs about what they perceive to be systemic deficiencies standing in the way of a growing mobile tech entrepreneurship ecosystem. Even in such cases, some entrepreneurs were engaged in efforts to change things for the better.

4.4.3. Systemic Challenges: “The Environment is Very Uncertain”

The ability of social networks in Kathmandu to supply valuable resources to their entrepreneur members is limited by the challenges that affect the entire Nepalese economy. Respondents mentioned the following most frequently: an unreliable power supply, political and regulatory uncertainty, a limited pool of skilled labour, and lack of integration into world markets.

Mobile technology entrepreneurs need an uninterrupted supply of electricity to run their computers and networking equipment, without which they are unable to work. Nepal’s potential for generating hydropower is enormous (Agrawala et al., 2003). Unfortunately, insufficient infrastructure and a lack of investment in projects to generate electricity from the country’s abundant water resources have resulted in severe shortages of power, petrol, and diesel throughout Nepal (Rai, 2012). As a result, many entrepreneurs rely on private generators or solar energy cells installed on private homes as back-up sources of power, but these are prohibitively expensive for many would-be entrepreneurs from poor families. A local contributor to the question and answer website, Quora, who identified himself with the handle “Daniel Dan,” writes the following:

Government electricity supply is completely useless, the load-shedding hours still reach up to 18 hours per day in winter without any electricity even in Kathmandu Valley. You have to have at least 1 backup ISP for the rainy day,

because private or government ISP's (sic.) are not reliable and have long down times.

(Quora, 2012).

Interview respondents shared similar views, disclosing that they must rely on backup generators—either their own, those owned by friends, or otherwise sourced via their networks—in order to continue their work, as mentioned previously in the section on high-speed Internet access above.

A second obstacle to growth of entrepreneurship and enterprises in Kathmandu mentioned frequently by respondents is political instability. Since the early 1990s, the country has experienced a near-constant lack of regime stability, and an acute constitutional struggle has paralyzed parliament between 2008 and 2013 (Lecours, 2014). The entrepreneurs interviewed described this political instability as a barrier to attracting investment and to keeping talented workers in the country. Binod said the following:

As you know, Nepal is going through political issues; people want to start on their own but they are not yet ready to take risk. It's not just entrepreneurs, but also investors. If we have more political stability then, for the new generation, mobile startups could be a big thing here. People are willing to work on the idea but the environment is very uncertain.

(Binod)

This quote is also illustrative of the very careful risk calculation at least some potential entrepreneurs make before deciding to found a company, and is contradictory to many analyses of entrepreneurs as a group willing to take on great uncertainty. While it is outside of the scope of this project, studying this process of risk estimation, and especially the role of networks in such an endeavor, could provide important clues for policy makers who wish to encourage entrepreneurial activity

A limited talent pool was a third barrier named by respondents, and it is related

to the persisting political instability in two ways: one, Nepal's highly skilled workers frequently choose to pursue opportunities outside of the country, which has resulted in over three million Nepalese living in 115 countries around the world (Jha, 2012); and two, the political impasse of the last decade has prevented university educators from achieving their goals of modernizing curricula offered to Nepali students (Dahal, 2011). According to the World Bank (2012e), Nepal's net migration was -14.6 percent in 2012, meaning that 400,570 people of the total population of 27,470,000 left the country. This is a very high brain drain percentage compared to other countries in the South Asian region with significant emigrant populations. For instance, it is 80 times higher than net migration from India, which lost 0.185 percent of its citizens to foreign markets, or 2.3 million people of the total of 1.24 billion (World Bank, 2012e). Jay commented on the acute effect of emigration of highly skilled workers on his business:

If you hire the best person for the job, they are very likely to leave in five, six months. So, I hire the second best, because then you have a chance to retain them in your startup, because you can't provide security for the long term in Nepal.

(Jay)

As briefly noted earlier, a number of respondents said that the talent pool for mobile entrepreneurship could be expanded if university courses better integrated mobile software development and entrepreneurship. Some interviewees felt that university administrators, in the current political context, do not have the right incentives to modernize curricula. Sunny said the following:

The university courses are outdated. The curricula haven't been updated, sometimes for 10 years. We hear about some revolutionary agendas that appear in universities like Stanford, but in our case, the unis don't care about those new things. So we have to improvise.

(Sunny)

Interestingly, as the above quote shows, respondents made references to entities in famous entrepreneurial ecosystems such as Silicon Valley even in the context of formal education, once again indicating a keen familiarity with that region. In contrast to the above comment, however, two respondents noted that mobile technology courses are now being added to university curricula. According to Milan,

Universities and colleges are also focusing in app development. The number of students doing project in apps [development] has increased and [is] increasing at greater pace. (Milan)

Arjun explained that he welcomed the opportunity to be involved in teaching a course in app software development:

Extra courses for app development are being designed. Just today, I got an offer from a college to teach Android app development. As an employment opportunity, it surely benefits me. It also helps me to make my public relations better so that I can take benefit of it in future.

(Arjun)

Specific training for mobile developers was seen as a gap that could be at least partially bridged by the community. Pramod suggested that providing training opportunities would not only strengthen the ecosystem by improving the skill levels of entrepreneurs, but would also reinforce the strength of the community itself:

To grow the community, you can provide training. The most interesting is the training for mobile app development; there is a huge demand for it. If the community can provide such useful resources and trainings to community members, [that] will take [the] community forward.

(Pramod)

He also described another unique challenge faced by mobile entrepreneurs in Nepal: it is often prohibitively expensive for them to obtain devices (e.g. mobile phones) for which they are developing products.

We need a testing facility that would provide devices so that developers could pay a small amount of money and test their app in a testing facility. That would also help with the community because it would get us together more often.

(Pramod)

It is interesting that Pramod did not say that each entrepreneur needed to have a dedicated set of mobile phones used for testing, but focused immediately on a testing “facility” that could serve the entire community.

None of the respondents mentioned entrepreneurship as an available topic of study, although Tenzin acknowledged that training via non-academic organization was beginning to be offered, after being asked specifically about alternative ways of obtaining such knowledge.

Some training institutions provide training for young people about entrepreneurship. [...] I don't know any specific ones.

(Tenzin)

Even for entrepreneurs who have been able to overcome the above barriers, the lack of integration with global markets remains difficult to overcome. For instance, focus group respondents explained that many Nepali entrepreneurs do not possess credit cards, due to banking regulations, preventing them from marketing their apps via global app stores such as iTunes or Google Play. In response, some mobile entrepreneurship community members who do possess credit cards have acted as proxies, processing transactions for their fellow entrepreneurs (and competitors) in good faith. This is not a sustainable solution, however.

Payment and investment mechanisms for customers are also needed, along with education of the potential customers. Pramod explained that the lack of electronic payment infrastructure and limited experience with mobile commerce have resulted in delays in the development of a marketplace for mobile apps:

In Nepal, we have no experience using e-commerce, e-payments, mobile banking. So, we've had to go out and build the payment gateways. We partnered with banks and now mobile banking is emerging through "PhonePay" and "EazyPay." Now, 15-20 banks have mobile banking – this wasn't the case just two years ago. People are just getting used to it. [...]

We really need to build the entire marketplace. We also need to have a path for commerce, so you can invest in new ideas.

(Pramod)

Kathmandu entrepreneurs seemed determined to resolve, or at least to continue trying to resolve these systemic challenges through whatever means were available to them, and these often meant working through their network ties. As the entrepreneurs indicate, the ability to solve individual problems has wider implications on their innovation ecosystem. Akash explained that by resolving individual questions, one task at a time, the community can tackle problems that affect the mobile technology ecosystem as a whole. He concluded by echoing another respondent who also found source for optimism in the rapid improvements of the ecosystem over a small number of years:

Three years ago, we didn't have any of this. Now, there is mobile money, a mobile online store, and a strong community movement. (Akash)

Overwhelmingly, entrepreneurs provided testimonies of their reliance on their networks for resources to help them run their fledgling businesses, especially when such resources were not available from traditional institutions.

4.5. Emerging Themes

The results presented above point to a number of emerging themes. The first relates to the importance of the community to the entrepreneurship ecosystem in Kathmandu, and

emerges from the frequency of the unprompted use of the word “community” by respondents and the way in which study participants spoke about their network: expressing a strong sense of camaraderie and social support, relaying the custom of sharing information despite any risks, and indicating preference for peer learning over alternative training methods. On a related note, the networking groups also seem to have reached a level of institutionalization by organizing regular events, such as competitions and meetups, and developing brand identities, such as in the case of the home-grown Mobile Nepal, or the franchise-like groups such as the Android developers network. While there were no permanent physical tech hubs in Kathmandu at the time of data collection, there was evidence that at least some non-governmental organizations lent their office spaces to the tech community outside of business hours on a relatively regular basis. At least one tech hub, Biruwa Ventures, seems to have been established since data collection was completed. The networks, thus, seemed to be giving rise to new institutions that acted as important sources of valuable information, labour, and, occasionally, financing, such as in the case of competitions Startup Weekend and PIVOT. The traditional institutions one might expect to support an entrepreneurship ecosystem, such as government, banks, mobile network operators or large companies were not found to be actively involved in the networking activities, although this seemed to be changing to some extent in the case of banks cooperating with entrepreneurs to establish mobile payment mechanisms, and in the case of larger companies, some of whom were represented at a number of networking events.

A second, equally striking theme is that many of the networking activities, as well as the terminology used to describe them, were modeled on Silicon Valley

initiatives. From the Startup Weekend competition, references to Stanford University, the idea that pitching to VCs was important for their startup success (despite the lack of a developed capital market in the country), and the holding of events called hackathons and meetups, to the mention of Google and Apple as companies with the “wow” factor, it was difficult to ignore the fact that the community members were inspired by the entrepreneurs in northern California. In addition, Kathmandu respondents spoke about their own environment either in directly comparative terms: “we don’t have anything like in Silicon Valley (Vinay);” “we don’t have mobile software courses like in the US or UK or India (Srijan);” or with the implication that the Nepalese environment is lacking in resources available in other ecosystems: “we don’t have incubators here (Sunny);” “the idea of entrepreneurship is foreign for most people in Nepal (Vinay).” Indeed, it would appear that awareness of other ecosystems strongly influences Kathmandu entrepreneurs in developing a local industry for their businesses.

Third, solving individual problems in a collaborative environment emerged as an important feature of the networking behaviour in Kathmandu, and this may be the very mechanism of action by which mobile entrepreneurship communities such as Mobile Nepal drive the development of the mobile innovation ecosystem in the country. Based on this observation, it could be postulated that community networks are effective tools in building entrepreneurial ecosystems precisely due to their granularity – the ability of individual members or small sub-groups of the network to resolve problems, from overcoming simple challenges, to completing tasks of considerable complexity. In addition the fact that very few risks of participation in networks were reported, pointing to a relative culture of collaboration in the Kathmandu mobile entrepreneurship

community, which could set this particular ecosystem apart from others. The role of pervasive global communications infrastructure, and primarily the Internet, would be difficult to overstate in this context.

A fourth theme relates to the unmet demand for mentors, and the accounts of newer entrepreneurs who expressed a desire to interact with more seasoned colleagues more frequently. As alluded to above, this could be a result of the recent growth in the numbers of entrepreneurs in Kathmandu, and the relatively small numbers of their predecessors who could act as mentors, coaches or advisors. Such growth is almost certainly supported by Nepal's recent economic growth, but also by the proliferation of Internet communications around the world and the availability of entrepreneurial examples and success stories beyond the traditional "hubs" of technology innovation.

Related to the lack of mentors is the increasing demand for skilled and motivated labour. In the case of Kathmandu, the absolute number of graduates from technical tertiary education programs was reported as the source of a bottleneck, however, the tendency of top graduates to leave the country and pursue employment opportunities abroad was reported as a difficulty for entrepreneurs looking to hire the right talent. To mitigate against this, some entrepreneurs resorted to hiring the "second best" candidates for their job openings, while others focused on finding potential employees who were self-motivated to contribute to the growth of a local startup.

Considered together, these themes indicate that a self-organizing, determined and cohesive groups of nascent entrepreneurs is collaborating to "hack" the regulatory, economic, or infrastructure-related limitations their environment places on the establishment and growth of their businesses. In order to do so, the entrepreneurs are

helping one another solve problems specific to their own situations (from answering complex programming questions necessary for product development to working together to circumvent ecosystem-wide lack of infrastructure); in this process, they are often relying on examples from what is probably the most prominent entrepreneurial community of our time, California's Silicon Valley. The reasons for this reliance could be the region's prominence, and the wide availability of textual, audio and visual information about the structures and processes employed there, especially online. While having a proven "roadmap" to follow seems to be working well for Kathmandu networking groups (i.e. their efforts seem to be providing at least some of the resources that established local institutions have failed to deliver), the reliance on a single model from a far-away economy could be contributing to a kind of tunnel-vision that may cause these entrepreneurs to overlook locally relevant and perhaps more-effective methodologies. Further, the use of Silicon Valley terminology could have an unintended effect of excluding local actors who could be useful to the development of the mobile technology ecosystem, but who feel alienated or inadequate in an unfamiliar institutional context. Integrating such individuals, as well as considering local practices, could perhaps make the contribution of the networking groups even more meaningful for the future of mobile technology entrepreneurship in Nepal.

4.6. Chapter Summary

Nepal is a poor country, landlocked and bordered by only two, much more economically powerful neighbours, India and China. It is recovering from decades of political instability and conflict, and its telecommunications sector is in the process of

catching up to global industry standard. Further challenges include an unstable supply of electricity, which causes frequent outages, continued brain drain, especially of the top software talent, and a lack of up-to-date formal technical training in topics such as mobile software or high-technology entrepreneurship. Yet these challenges have not stopped a group of enthusiastic mobile software developers from nurturing a community of entrepreneurs determined to build a new, local market for their businesses. In this effort, the community has benefited from a relatively good supply of computer programming graduates, some of whom have experience with outsourcing and working with Indian, Chinese and western companies, and from a growing demand for locally-relevant mobile applications (due in part to a lack of supply of such apps by existing industry firms and to increasing mobile penetration rates).

Five themes related to this process can be distinguished in the data collected for this study, with the most important being the value placed by the interview respondents on the support provided by the community to them at the individual level, and to the cause of mobile software entrepreneurship at the societal level. This support is exemplified in the provision of various resources, including non-subjective ones such as knowledge, labour, financing, Internet access and office space, but also subjective ones such as self-efficacy and legitimacy. The second theme emerging from this case is associated with the study respondents's awareness of other entrepreneurship ecosystems, including in the US, UK and India, and the apparent direction of development of the entrepreneurship ecosystem, with a clear focus on Silicon Valley as a model and with the usage of terminology (such as StartupWeekend), tools (meetups and coworking spaces) and goals (the pursuit of venture capital) common in that

environment. The third and fourth theme are related: while entrepreneurs said that they relied on the community to solve individual problems, indicating a high level of trust and collaborative behaviour, they also reported a lack of mentors who could help them with further development of their products, services and businesses. Fifth, a continuing “brain drain” of top technology graduates emerged is a barrier to the development and growth of startups in Kathmandu. All five of these themes will appear in the remaining two cases, focusing on Nairobi and London, to different extents. As the following two chapters will show, the second theme (the reliance on Silicon Valley as a model of development and as a source of legitimizing references and knowledge) will emerge as the most pronounced shared characteristic between the three ecosystems.

5. Networks of Mobile Technology Entrepreneurs in Nairobi

For many people around the world, the mention of Kenya evokes images of marathon winners, exotic flora and fauna of the Masai Mara, and stunning landscapes of the Great Rift Valley (Bowden, 2007). Others may describe Kenya in terms of exports of flowers, premium teas and coffees (MIT, 2013), or the country's economic and governance challenges (World Bank, 2014a; 2014b). International passengers landing at Nairobi's Jomo Kenyatta airport for the first time around 2010 may have therefore been surprised, as I was, to find that their very first experiences in Kenya were related not to exotic safaris or fine teas, but instead, to mobile technology: bright billboards depicting smiling businessmen, mothers, and students talking on their mobile phones lined the airport's hallways, informing passers-by of special offers by the major mobile network operators such as Safaricom, Airtel/Zain, Orange and Vodafone. Other advertisements introduced Safaricom's service M-PESA, the country's most popular mobile money platform, and its competitors, Airtel/Zain Zap, Essar yuCash and others. On the lower level, passengers could buy a local SIM card to avoid international roaming charges, or connect their smartphones or laptops to airport wireless Internet for free. Once in a taxi, the driver offered his mobile phone number and his taxi services for the duration of my visit. All of this evidence of widespread use of mobile technology, and of its integration into commercial activities, was striking to observe in a country that continued to be among the world's poorest. The next section will introduce some of the demographic and economic values that help to put the data collected for this study into further context. As in the previous chapter, these values correspond generally to the

period during which data collection was performed.



Figure 7: Communications Equipment in Kenya's Great Rift Valley.

Photo: Ian Southwell, 2010, CC BY-NC-ND 2.0

<https://www.flickr.com/photos/southwellpics/5288495509>.

5.1. Mobile Innovation Ecosystem Overview

Kenya is a low-income country, with GNI per capita (Atlas method) at the time of data collection of only \$820, compared to the UK's \$37,780 in the same period (World Bank, 2011b). Most of the population is rural, and approximately 75% of Kenyans

depend on agriculture as their source of primary income, 16% on manufacturing and construction industries, and 9% on services (Central Intelligence Agency, 2012a). Nearly half of 42 million Kenyans are estimated to be unable to meet their daily nutritional requirements. In 2012, 46% lived under national poverty line, 40% were unemployed, and 30% lived on \$2 per day or less (International Fund for Agricultural Development, 2011). Yet Kenya has some unique advantages over a number of countries with comparable economic characteristics in other parts of the African continent and beyond. Kenya has a long history of international trade (Ochieng & Maxon, 1992), and is the most advanced country in East Africa, itself a dynamic region with one of the highest economic growth rates in the world, estimated at 4.1% to 5% for 2012 and 2013 respectively (World Bank, 2012g). Kenya's population is diverse: it includes most major ethnic, racial and linguistic groups found in Africa (Central Intelligence Agency, 2011), many of which have a rich history of trading in specialized indigenous industries (Ochieng and Maxon, 1992). English is one of two official languages (the other being Swahili) which enables the country's entrepreneurs to access global markets and networks with relative ease. Small businesses in Kenya have roots in community-level trading, and there are many instances of collective entrepreneurship (where goals, risks and profits are shared by a group; see Auserwald & Branscomb, 2003, Etzkowitz, 2003; Etzkowitz & Klofsten, 2005; Lundvall, 2007) and social commitments are combined with economic interests (Mungai & Ogot, 2012). Cooperatives or businesses managed by women's groups are among modern examples that attest to this heritage (Mungai & Ogot, 2012). All of these characteristics make Kenya a likely setting for entrepreneurship in new industries, such as mobile

technology.

5.1.1. Mobile Technology Industry

Kenya's mobile ecosystem is situated within the wider geo-economic context of the African continent, to whose growth it contributes. At the time of data collection, Africa was the world's second largest mobile market by connections after Asia, and the fastest growing mobile market in the world (GSMA, 2011). Between 2007 and 2012, the number of mobile subscribers across the continent grew by nearly 20 per cent per year to reach almost 650 million in December 2012 (World Bank, 2012g). In the same year, Kenya was the third-largest mobile market in Sub-Saharan Africa, and sixth-largest in Africa (including North Africa), with 29.2 million connections (Communications Authority of Kenya, 2012a), translating to a mobile penetration rate of nearly 70 percent in 2012. Mobile subscriptions were growing quickly in 2012, with expectations to have 39.5 million, or 83 percent of the population, connected by 2016 (MarketResearch, 2012). By comparison, there were only 272,101 landlines in the country, or one for every 107 mobile connections (Communications Authority of Kenya, 2012c). While the predominant handsets were feature (simple) mobile phones, investments in infrastructure were being made to allow 500,000 connections to next-generation, LTE networks by 2014 (GSMA, 2011).

Mobile devices are the primary tools Kenyans use to access the Internet: 99% of the 11.7 million Kenyans with access use mobile phones or laptop dongles to get online (Communications Authority of Kenya, 2011). While no studies proving the causality for the high use of mobiles versus other devices to access the Internet are available, is reasonable to assume that the lack of traditional communication infrastructure—from

roads to landlines—is at least part of the explanation for the rapid mobile expansion in Kenya and the whole of Africa. The choice of the mobile platform over other options is not limited to the communications or transport-related sectors.

As mentioned in the introductory chapter, in addition to entrepreneurs, mobile technology ecosystem actors include a variety of actors, including mobile network operators, device (or handset) manufacturers, software development firms, individual developers, mobile application users, financiers (investors and donors), and third party content creators, such as marketing agencies or businesses in other sectors like health, entertainment or agriculture, interested in mobiles as a product and service delivery platform. By far, the largest mobile network operator in Kenya in 2012 was Safaricom, which held 65 percent of Kenya’s mobile subscriptions (Communications Authority of Kenya, 2012a). Airtel Networks, Yu/Essar Telecom and Telkom Kenya/Orange, who entered the market after the 2008 liberalization of the sector, followed with 2012 market shares of 15, 11, and 8.7 percent respectively (Communications Authority of Kenya, 2012a). As a result of price wars between competitors, voice, text and data charges were relatively low in 2012, supporting growth in subscriptions and usage (Rice, 2010; Itosno, 2012). A number of government bodies are relevant to the mobile industry, most directly the Communications Commission of Kenya (CCK), the Kenya ICT board, and the Ministry of ICT. In addition, government agencies responsible for other sectors, such as the Ministry of Agriculture and the Kenya Medical Supplies Agency were cited by three respondents of this study as providers of data and standards. Due to the widespread use of mobile money, the Central Bank of Kenya is also involved in articulating policy relevant to mobile technology. Kenya is unique in its significant

adoption of mobile money applications, discussed in more detail below. A significant portion of Kenya's gross domestic product moves through the mobile money platform M-PESA each year, with estimates varying from 11% (Banking on Mobile Phones, 2010) to 20% (Smith & Rainie, 2012) of GDP.

In 2012, Kenya's mobile industry accounted for a significant part of the overall economy—up to 60% of GDP could be directly linked to the mobile industry (GSMA, 2012b). This impressive figure is a result in large part due to high mobile money penetration; however, Kenya's mobile industry remained at an early stage of its evolution in terms of technological, human, and financial capital. The country's low-income status, high poverty rates and lack of a developed high technology industry make the significant growth of mobile technology, driven in part by indigenous entrepreneurs, particularly interesting for a comparative study. Further, studying mobile entrepreneurship in Kenya could also yield results relevant for entrepreneurship and economic development in other sectors, since so many of the country's real economy activities depend on mobile payments infrastructure and other mobile technology applications.

5.1.2. Environment for Technology Startups

Kenya's mobile entrepreneurs are a heterogeneous group, adding to the diversity of the already multifaceted ecosystem. Most of them live and work in or near the capital, Nairobi, with a smaller cluster also present in Mombasa. Besides self-taught founders, and those with business and agricultural backgrounds, there are entrepreneurs who start their businesses as students enrolled in university degrees in computer science, such as those from the Faculty of Information Technology at Strathmore

University or the University of Nairobi. Academic institutions have embraced the phenomenon, with Strathmore University's Faculty of Information Technology setting up "@iLabAfrica" (see <http://www.ilabafrika.ac.ke>), a research and incubation centre to assist entrepreneurial students. Independent courses run by small organizations such as eMobilis (Maree et al., 2013) and AkiraChix (Andjelkovic and Imazumi, 2012), are also available to entrepreneurs and often connected to networking "hubs" that have emerged between 2008 and 2012. In addition to @iLabAfrica, seven other hubs were in operation in Nairobi in 2012, including the pioneering iHub (Hersman, 2012a), along with Nailab, Growth Hub, Pawa254, Nokia Hub, Startup Garage and m:Lab East Africa, the last four of which specializes in incubating mobile startups (interviews; Moraa & Gathege, 2013, BongoHive, 2013). A testament to the speed and, possibly, an indication of the potential for mobile entrepreneurship growth in Kenya, can be found in the fact that none of these hubs existed in 2008. The establishment of iHub, which started as a community-driven space providing a casual, co-working setting to technology entrepreneurs (Hersman, 2011), is widely regarded as a symbol of Nairobi's tech entrepreneurship ecosystem. iHub was opened in 2010 in Nairobi, Kenya, as an open space for technologists, investors, tech companies, and hackers to meet and work (Hersman, 2010), by a team that had founded Ushahidi, a crisis-mapping software, in the aftermath of Kenya's disputed 2007 election (see: <http://legacy.ushahidi.com/>). Initially, it was a largely empty space with fast broadband, which was difficult to access for mobile and other tech entrepreneurs at the time, and enough of an incentive for many to spend considerable time at the iHub; two years later, iHub's founders' vision to provide a community for Kenya's technology innovators translated into serving a

membership of over 6,000 members and hosting approximately 120 industry events per year (Hersman, 2012a).

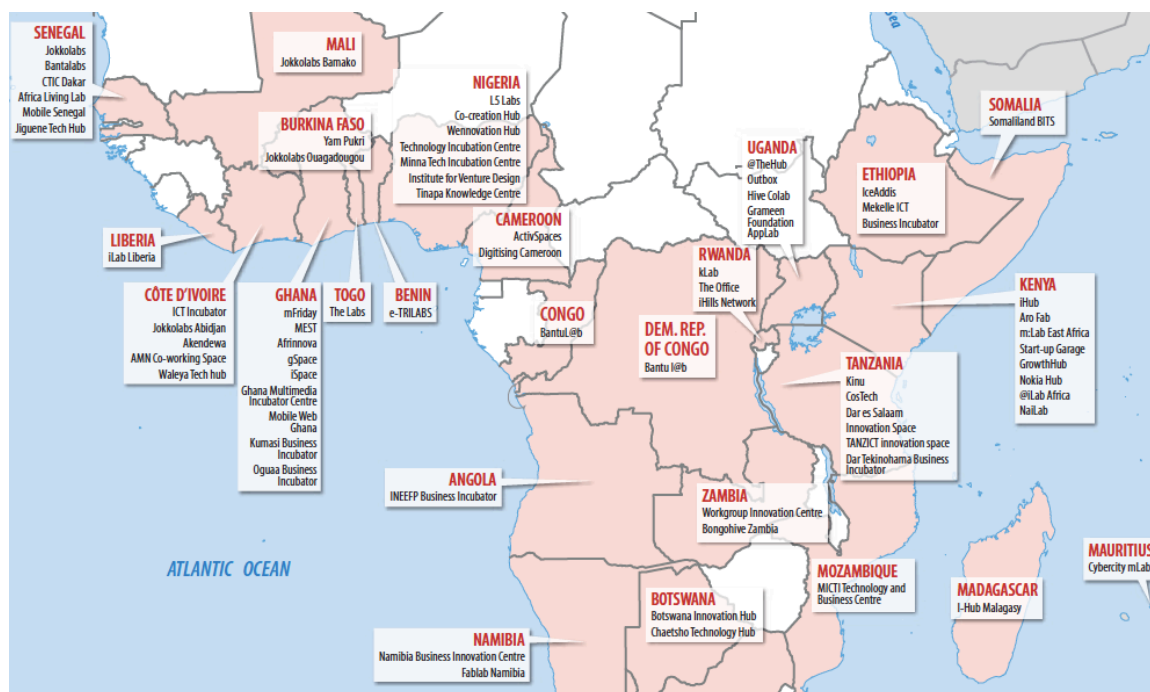


Figure 8: Map of technology hubs in Sub-Saharan Africa, excluding South Africa (World Bank, 2014c)

The demand for gathering spaces such as the iHub is further confirmed by the appearance of similar hubs across Africa. According to Erik Hersman, founder of iHub, the trend has inspired other communities. In East Africa alone, there is now a network of 14 labs in 10 countries (Afrilabs), and there are an additional 50 hubs, labs and accelerators in more than 20 countries (Hersman, 2012a). The iHub is also seen as a source of African tech leadership: for example, Ms. Ory Okolloh, who helped to create the iHub and was previously an entrepreneur herself as a co-founder of Ushahidi, went on to lead the search-focused company Google’s policy team in Africa. Further, the concept has spread around the continent: Uganda’s Hive Colab, Nigeria’s Wennovation Hub, South Africa’s mLab, and Cameroon’s Activespaces are examples (Powell, 2012).

What can only be called speculation – in absence of research data - of why these hubs are becoming popular is summarized by this quote:

It could bear a lot of fruit in a place like Kenya, where you have a lot of raw talent but very little support for it.

(Sam DuPont, program officer, Internet freedom, Freedom House in Powell, 2012.)

Each of these hubs provides, at a minimum, working space and broadband to members, often with a coffee shop on site to facilitate informal networking. The general purpose of the hubs, according to iHub's founder, is “connecting the people within the tech community in that area to each other and to the greater global industry.” (Hersman, 2013). The physical facilities of the hubs are also used for workshops, meetings, technical and business training, competitions, meetings, media events and product launches.

Almost all major mobile apps launched in Africa are in some way associated with one of the labs or hubs, according to Shapshak (2012) and many of the entities have relationships with large companies like Google, Nokia, Samsung, Safaricom, MTN, etc. as well as with government and universities, including some abroad. This bridging between different groups of ecosystem actors is an important aspect of the functionality of social connections. According to focus group participants, some operators have departments for relations with developers and provide tools for developers, e.g. Safaricom has a dedicated program called Sandbox and hosts the AppStar competition in collaboration with some of the technology hubs. Several respondents explained that the technology hubs are not only gathering spaces where one can turn to for help and support but also often the focal points for competitions, which

are usually organized in association with venture capitalists and aimed at identifying talented startup teams. Unsurprisingly, the most popular pitching contests are those with prizes and significant media attention, such as Pivot East and Human IPO. The iHub team has also launched Savannah Fund, an initiative aimed at attracting more startup capital to Nairobi, discussed in more detail below. At the time of data collection, each of these hubs provided, at a minimum, working space and broadband to members, and most either contained or were near a coffee shop, which encouraged informal networking. The physical facilities of these hubs are also used for numerous workshops, meetings, technical and business training, competitions, meetings, media events and product launches.

Thousands of local businesses, especially related to the banking and retail sectors, hire mobile developers to design apps to reach their customers. Businesses also hire developers to design internal or business-to-business apps. Over 1500 developer jobs were advertised on the iHub website in October 2012 (iHub, 2012). Marketing agencies, and their industry association, the Mobile Marketing Association East Africa, are also active participants in the mobile ecosystem (see Kemibaro, 2011) All of these actors are potential customers of mobile entrepreneurs. In Kenya, much of the demand for mobile applications created by these actors incorporates the widespread use of mobile money, a service that was at time of data collection unique to Kenya in its reach.

Demand for mobile applications was strong and expected to grow in 2012; however, entrepreneurs' ability to capitalize on growing opportunities was constrained, due in part to the fact that, traditionally, angel financing and venture capital have been extremely limited in Africa (Bruton, 2005). Investment in Kenya by venture capital

companies based in the United States—where the venture capital market was largest (Ernst & Young, 2011)—has been negligible, with only three deals recorded between 1980 and 2009, according to Pandya and Leblang (2011). Locally, Memba et al. (2012) cited four venture capital firms in existence that year: Kenya Equity and Term Financing, Acacia Fund Limited, Aureos East Africa, and Kenya Management Company Limited; at least four other firms, Helios Investment Partners, Kibo Fund, Fanisi and Catalyst Principal Partners, were also active in the country, according to their websites. Most such firms focus on established businesses in traditional sectors such as manufacturing, merchandising, agriculture and traditional services, and not on early-stage startups focused on mobile technology (see Memba et al., 2012). Despite this, the number of angel investors and venture capitalists in Kenya’s mobile sector was seen to have increased along with the growth of the other parts of the mobile ecosystem and the year 2012 saw the creation of Savannah Fund, the first technology fund dedicated to early stage startups in sub-Saharan Africa, based in Nairobi (Hersman, 2012c). The fund aims to bridge the early stage/angel and venture capital investment gap that remains an obstacle for entrepreneurs in Africa.

The lack of funds, or mechanisms for transferring funds, including investment, lending and savings, extends far beyond the entrepreneur demographic. (Mas and Morawczynski, 2009; Ngugi et al., 2010) There is a great demand, by the general public and especially the rural population in Kenya, as well as much of the rest of Africa, for mobile apps related to fund transfers and money management. As the next section shows, the scarcity of financial infrastructure, combined with the scarcity of reliable means of physical transfer of money, plays an important role in this demand.

5.1.3. Global Leadership in Mobile Money and Implications for Mobile Apps Use

Many people who live in poverty lack access to effective money management tools, either because of a lack of financial infrastructure or because banks are hesitant to accept customers who are not deemed credit-worthy. Demircuc-Kunt and Klapper (2012) have estimated that approximately 2.5 billion adults, most residing in developing countries, lack a formal bank account. Kenya is a world leader in the use of mobile money (Maurer, 2012), and mobile payments, savings, credit and transfer services are especially popular among the “unbanked”—poor people who would otherwise be unserved or underserved by traditional banks (Mas and Morawczynski, 2009). M-PESA, the first Kenyan mobile money service introduced in early 2007, had grown to register fifteen million customers by 2012, giving its operator Safaricom a 79% market share in mobile money services (GSMA, 2012c). This is a level of penetration in the mobile subscriber base that no other mobile phone-based service has achieved, outside of voice and text messaging (Maurer, 2012).

In Kenya, many rural families include at least one member who is employed in an urban setting, and who frequently sends money home; however, since there is no retail-based, or technology-enabled alternative with a broad enough network of service points to cover all urban and rural areas, most migrant workers rely on friends and family members traveling from cities back to their villages to transport the earnings. This method is inexpensive but unreliable – it is not always easy to find friends or relatives to carry the money, and there is considerable risk of the money being stolen. Some matatu (shared taxi) companies offer to deliver money to destinations along their routes, but this is illegal and can be expensive (interviews). The post office operates a

legal alternative, PostaPay, but users have complained that branches suffer from inefficiency and cash shortages (interviews). These conditions created an opportunity in the domestic remittance market in Kenya, which M-PESA, a mobile money service introduced in 2007, has since largely filled (Mas and Morawczynski, 2009). That there is no other country where mobile money has been so successful is largely ascribed to the fact that Kenya's mobile market was dominated by Safaricom at the time of M-PESA's launch (Mas and Morawczynski, 2009). In 2007, Safaricom had a 77% share in voice telephony, a number that dropped to 64% by October 2012 (Communications Authority of Kenya, 2012). The immediate large network effect provided by Safaricom's subscribers gave M-PESA an instant advantage compared to a similar service that could have been introduced by a much smaller competitor. M-PESA's business model includes a network of thousands of sales agents, normally located within small shops, who act as intermediaries, providing financial infrastructure for the otherwise "unbanked" or "underbanked" population (Hughes & Lonie, 2007). The agents receive deposits from registered M-PESA users, give cash (withdrawals) to customers, and assist customers to use M-PESA services. Today, all operators and some banks offer competing services. Users report a high level of trust and comfort with mobile transactions and mobile phones are used to pay for utilities, school fees, retail purchases, tickets, food and account top-ups (Mas & Morawczynski, 2009).

The significance of the ability of mobile money applications to bring banking services to people who would otherwise be without access to them should not be understated; however it is also very important to note that the widespread experience of the population with mobiles and mobile apps is a positive factor for Kenya's mobile

ecosystem on the whole. Dutton and Shepherd (2006) find that experience with Internet technologies was the primary driver of trust in the Internet, with other user attributes, such as age or gender far less important. Just as experience has been found to “generally provide a learned level of trust in the Internet” (Dutton & Shepherd, 2006, p. 434), it is reasonable to speculate that experience with mobile money apps has provided a learned level of trust in mobile technologies. This may explain the relatively wide adoption of other apps by Kenyans, for instance, ones applied in farming and agriculture. In developing countries, agriculture is not often associated with modern information technology. According to the International Fund for Agricultural Development (2011), 79 per cent of Kenya’s population lives in rural areas and relies on agriculture for most of its income. The poorest, small scale farmers lack access to information and markets since they have little produce that can only be sold at local markets or to brokers who buy it at very low prices. Farmers also have limited access to affordable farm inputs, which hinders yield. A mobile app focused on transparency of agricultural transactions, M-Farm, enables farmers to find current prices of 42 crops in specific markets throughout Kenya (M-Farm, 2012). Up-to-date market information empowers farmers as they bargain for a fair price with middlemen and purchasers. M-Farm also provides farmers group selling and buying services, helping them increase profits, decrease costs and access large-scale local and international markets. Over 10,000 farmers use the service as of November 2012, according to one of the founders. Most have significantly increased their profits and developed direct and stable market relationships with buyers who are also M-Farm clients. Media houses such as TV and radio stations who pay a subscription fee for M-Farm’s daily feed also use the price information content. The

company was launched after winning IPO48, a 48-hour competition for startups in Nairobi (conversation with Jamila Abass, and Abass, 2012). Many other apps, including those related to traffic monitoring, price checking, healthcare, safety, law, education, and governance are produced and used in Kenya. In 2010, three entrepreneurs from Nairobi – one of whom was interviewed for this study and consented to being identified in this way - developed a mobile application that commuters can use to track matatus – independently run shared taxi services that do not follow strict routes or schedules. The app, called iCheki, relies on small GPS devices installed by matatu owners, to allow customers to obtain information on the arrival time of the next matatu by SMS. The same, relatively simple system has been used by taxi and freight-truck fleet managers to show the location of their vehicles in real time (for instance, the established Kenyan company STOIC). The widespread use of mobile money and services such as iChecki and Huduma, a mobile platform for reporting and resolving community infrastructure problems, are indicative of the tendency of local entrepreneurs to think about mobile technology as a tool for innovative solutions to local problems, rather than another or an alternate delivery platform for existing services, as is the case in many developed countries.

5.2. Motivations for Networking

As in the other two cases, interview questions posed to Nairobi entrepreneurs generated data from which the following two broad categories emerged: motivations for networking and risks assumed by networking. Other observations made by respondents, some of which are particular to the Nairobi tech entrepreneurship ecosystem, and some

of which are related to data collected in Kathmandu and London are also reported in this chapter. Unsurprisingly, entrepreneurs in Nairobi reported finding various types of resources through their networks. Of the 23 mobile entrepreneurs interviewed, 22 indicated that they turn to members of their networks for resources. Only one Nairobi respondent reported to have launched an application without any help or financing:

I don't depend on other people, I am self-taught. [...] I code by myself. [...] It's cheaper and faster. Fixing someone else's bad code can take hours.
(Wainana)

All other informants reported participating in networking activities, although their motivations and perceptions of benefits and risks differed. These are explored in the following sections.

5.2.1. Community Support: Tech Hubs and Meetups

Just as the word “community” seemed to dominate the descriptions of networks in Kathmandu, so does the phrase “tech hub” stand out in terms of frequency with which it was mentioned by entrepreneurs in Nairobi. Individual social ties were frequently mentioned in the context of “hubs,” such as iHub discussed above, along with “meetups,” a term that appeared frequently in Kathmandu as well. Entrepreneurs used the word “meetup” to refer to a variety of events, including app competitions, workshops or thematic social gatherings. Tech hubs and meetups were named by participants without prompting, thus ‘concretizing’ the idea that networks can give rise to, or be treated as, institutions (Bruyn, 1966). Resources such as social support, knowledge, labour, financing, and internet connectivity were all reported as benefits of belonging to communities surrounding tech hubs and of attending meetups, with Nairobi’s iHub as the most frequently cited example. Phrases like “meeting people,”

“finding new contacts,” and “making connections” and “making friends” were used by all but one respondent in the context of describing motivations for participating in networking activities; this may sound obvious – social networks are, after all, composed of people and connections between them, but it is nevertheless important to recognize that entrepreneurs in Nairobi consciously sought to develop relationships with individuals or groups, without knowing exactly which benefits—if any at all—they would receive. Justin, a recent entrepreneur who had been introduced to the iHub by a friend, underlined the importance of shared experiences and social support for the creative process:

The people [at iHub] are also your friends. It’s not just about what can you get from them (sic.). Sometimes you just don’t want to sit at home alone and work. This is also why hackathons are great. You meet similar people, who like to code, or who are trying to find a technical solution to some problem.

(Justin)

In other words, while networks are used to locate tangible resources, they can also fulfill an important need of entrepreneurs to belong to, and contribute to a community.

While many of the Nairobi entrepreneurs reported using the iHub as a social co-working space, most had also participated in meetups or other events organized by the iHub or one of the other tech hubs. The majority of such events could be grouped into hackathons, app competitions and pitching competitions. A “hackathon,” short for a coding (referred to as “hacking”) marathon, can take on different forms, from having very little structure and no particular topic assigned, to the more coordinated version, in which community members suggest and prioritize problems and then “hack” or write code to provide technical solutions. App competitions are similar, but tend to be highly structured and involve entrepreneurs presenting their previously produced mobile

applications to the community, with more experienced members (or, less frequently, peers) acting as judges to identify the most promising projects. App competitions were commonly mentioned as a way to obtain prize money or links with investors and influential community members; however, here, too, the community support was mentioned frequently as an important benefit. In addition to small amounts of monetary reward, participants emphasized competitions as way to build their own confidence and legitimacy in the community. Njeri, a female entrepreneur whose team launched a successful company after winning an app contest put it this way:

When we won, it wasn't about the [prize] money. The biggest thing was the sudden confidence [...] from yourself, from your team, from your community, that you're not wasting time. And the second thing is exposure through the competition and the brands behind it, [...] Nokia, Blackberry, Google. [...] It helps for people to know you won.

(Njeri)

A note on competitions is warranted here, as competitions generally received a high number of mentions in interviews. While the nature of this study is qualitative, the high frequency with which they were discussed was surprising. This may have been influenced by high profile competitions held in 2011 and 2012 such as Pivot East and Human IPO, Google Android Channel, and Nokia Develop for Millions Challenge, mentioned by several participants who themselves either won cash prizes at these events or knew the winners very well. As mentioned in the methodology chapter, the publicity these events garnered could have contributed to the visibility of winners in their peer groups, making their selection via snowball sampling more likely. This could have skewed the perception of respondents in a way that resulted in an overly high estimate of the role of competitions as sources of funds. However, it is also plausible that the

Nairobi mobile ecosystem is characterized by a relatively high number of app competitions compared to other locations.

Hubs and meetups, including hackathons and app competitions, seemed to be particularly influential in the early decision making process, i.e. at a time when entrepreneurs are making the choice to pursue an idea. Similarly to the experience of Kathmandu respondents, Nairobi entrepreneurs reported sharing preliminary plans with acquaintances, peers and mentors who also attended or participated in hubs and meetups, and seeking their feedback. The regular or semi-regular meetings allow members to first get to know one another and later discuss specific ideas in an open ended way, which often resulted in other community members providing support, relevant information or even labour (e.g. by joining as co-founders). The encouragement resulting from these interactions was reported to be a significant motivation to participate in meetups and spend time at hubs. Yusuf, who built a mobile payments application for use by merchants and individual customers, explained how the iHub community encouraged him and his co-founder to pursue an idea:

[Co-founder] and I already worked on projects together, and we just started talking about this new idea one day while we were at iHub. [...] We decided to sketch it out and then began to work on it together right away.

(Yusuf)

A number of respondents explained that they were careful to treat their networks in a respectful manner and relayed that they were aware of the cost their network ties incurred by interacting with or assisting them. John, a repeat entrepreneur who spoke about the need to balance distractions in a space like a tech hub, said that he was careful not to disturb others unnecessarily, and that he also found it distracting when others would interrupt his work. He explained that there was a sort of hierarchy involved in

problem solving that starts with Internet research and ends with seeking help from other iHub members, only when more independent methods don't yield results:

Some people know a lot and are really valuable, they can teach you, but you shouldn't ask them stupid questions. It helps to try to answer your own question first, before you ask, and many times, you can just find [the answer] on the Internet.

(John)

This type of behaviour—judicious use of network connections—indicates that entrepreneurs place a high value on their connections and that strong social norms govern network interaction. The Internet was mentioned by a number of respondents as useful in helping entrepreneurs ensure that they only approach their network ties when absolutely necessary, providing a type of efficiency to the networking process. Yusuf explained that efficiency was his main concern when seeking new information:

I just do whatever can get me the answer the fastest, and if I'm by myself, or if I don't want to bug someone who is working next to me [at iHub], then I google it or post a question in the [online] forum.

(Yusuf)

While anonymous consultations online seemed to have a role in ensuring particular qualities of in-person interactions, specific Internet forums were also found to provide a type of community support for Nairobi Entrepreneurs. Resources found on the web were mainly shared by (virtual) acquaintances and peers who were not always anonymous individuals. In fact, respondents spoke of particular participants on Internet forums they could count on for expert help. Benjamin, who had built a successful career as a software developer before realizing that creating original mobile apps could offer more flexibility and room to be creative, said that it was important to get technical advice from the most qualified programmers. He described the strategy he employs to

achieve this:

I will only log on at a particular time of day, because that's when one of the best hackers logs on; so I save my questions and post them then, so that they are at the top of the queue and he sees them.

(Benjamin)

Another respondent, Samuel, spoke about the relationship between online and offline interactions. He relayed that his online interactions were comparable to other friendships and that they sometimes led to personal meetings, which he found valuable especially if they involved individuals who lived far away. He said:

I have met people from all over the world, and sometimes they come to Nairobi, or I travel to where they are and it is always exciting to meet them in person. It is a great way to meet people. I have many friends on Internet forums who help me.

(Samuel)

In other words, some Internet forums act as international virtual communities, and their role could be compared to those of meetups and tech hubs. Moreover, social connections formed through online interaction could evolve into stronger ties that include in-person meetings. Finally, the leaders of communities centered around meetups and tech hubs in different locations around the world seemed to connect to one another online and to participate in each other's meetups and tech hub activities when traveling to each other's countries. Thus, the Internet allows for individual members of local networks to interact online and provide a bridging function between communities of entrepreneurs around the world. It is also likely that the entrepreneurship communities learn from one another, and adopt each other's methods and structures they find inspiring or perceive to be successful.

5.2.2. Knowledge: “Stay on Top of Trends,” “Solve a Wicked Problem”

Nairobi entrepreneurs reported to have obtained various types of knowledge from a wide variety of sources within their networks. Knowledge was also mentioned in unprompted terms such as advice, idea validation, tutoring, and help in the context of strategic business guidance. The most sought-after types of knowledge were up-to-date market information, both from within and outside of Kenya, and feedback used to validate their business and product ideas and designs. Nelson, a very recent mobile app entrepreneur in his early 20s, said he was drawn to events with speakers from big, global corporations and local hackers, because of the combination of perspectives that result in better overall information about new market developments:

There is a series of gatherings on Saturdays and Sundays I try to attend whenever I can. They have good speakers, from Nokia, Google, local top hackers. It’s a good way to learn and stay on top of new trends.

(Nelson)

Similarly, idea and design validation were highly valued resources obtained through networking events, as discussed briefly above. Lawrence, an entrepreneur who was involved in organizing some of the Mobile Monday Nairobi events, said that his motivation for taking a leading role in Mobile Monday created the opportunity to meet influential professionals from non-technical fields, where mobile technology could be applied:

Mobile Monday is a great format, because it’s usually on a particular theme. So you can learn from the presentation, and then you can meet other people. It’s not only programmers [who attend], but also other people [working] in the same area. When we first had the idea for [a mobile health app], we didn’t know many people in the medical field. Through connections at Mobile Monday, we were able to get some preliminary feedback and [...] we changed the focus of the product.

(Lawrence)

Feedback on prototypes was reported to add specific knowledge required to refine an application and fix any bugs. This feedback was obtained from early test users, many of whom were peers, mentors, family and friends. Nelson noted that his peers and friends helped to distribute his app and provided useful feedback:

I sent the [link to my] app to all my contacts, and people would forward it on to their friends and those friends would forward it around. Now the ones who really like it text me questions and requests for features. Some of them even call me at strange hours. One guy called me and asked me how to uninstall the app because his kid was using it so much it was wasting the battery. [Laughs.] [...] That told me it needed to be more battery friendly.

(Nelson)

Benjamin, who frequently relied on online exchanges, also explained that the personal, local networks perform a number of functions related to knowledge, including sharing information about industry trends and providing help with particular challenges:

The Android community sends around information about cool stuff, new trends, new knowledge. I was able to solve a wicked problem three days ago with the help of some of the guys, you can't put a price on that.

(Benjamin)

The choice of the particular source of information consulted seemed to be partly circumstantial, and partly dependent on the type of information sought.

It wasn't only obtaining knowledge, but also sharing information with the public that was achieved through networking. For instance, marketing support was a frequently cited reward, and institutional networks, such as the technology hubs, were mentioned in this context. Samuel, who said he had a lot of learning to do about the business side of running a company, said that the iHub had been instrumental to his own marketing efforts:

I could never get the attention for my app on my own. But when you go to iHub, there are people there, [...] and it's constantly being watched by journalists, so your chances of [the project] being picked up [by the media] are immediately very good.

(Samuel)

A number of other entrepreneurs also reported receiving marketing benefits via the iHub. The effect is not a result of any formalized procedure the iHub has for acquiring media contacts; it seems that simply being in the iHub increased the chances an entrepreneur would make a useful connection with a journalist.

5.2.3. Labour: "iHub is the First Place"

Many entrepreneurs consulted were very concerned about the lack of skilled talent available in Kenya, and in neighboring countries such as Uganda or Tanzania; this scarcity translated in very high wages commanded by East African developers with a high skill level. Rashid, who was working on his third company at the time of the interview, said:

It's a big, big challenge. It's really difficult getting good talent. The good talent wouldn't move from where they are because you don't have enough money [to pay them].

(Rashid)

The main barrier to identifying talented developers was reported to be insufficient technical academic training. Nearly half of the entrepreneurs said that existing courses on offer in universities and colleges were out of date, although specific programs were noted for their efforts to keep their curricula current, namely the Strathmore iLab and peer-learning networks and companies such as eMobilis, however, the demand for such training was felt to far outstrip supply.

Due to this shortage of labour, Nairobi entrepreneurs regularly and actively sought talent through their networks, and reported finding employees or cofounders through peers and acquaintances, both in the context of tech hubs and meetups, and in one-on-one interactions. The Internet, including sites maintained by tech hubs, like the iHub job board, and friends, including university acquaintances, were also frequently mentioned sources of labour. Rashid explained that the particular skills needed influenced where he sought help. Thus, he advertised online for technical help, because he could test someone's skills quickly and accurately, while he preferred recommendations from personal contacts for roles that involved strategy or sales, since it was more difficult to ascertain "soft" skills through an interview. Another repeat entrepreneur, John, said that he had relied on acquaintances from the Bloggers Association of Kenya, or BAKE, to find help with different roles, including part time programming and part-time marketing help:

The people at BAKE are always very helpful. It's pretty new but there are a couple of great developers who have done some coding for me, but more importantly, that's how I found someone to do online sales: through word of mouth [...] but from a trusted group that I know got was I was trying to do.
(John)

The networks also seem to increase efficiency in the labour market, since membership is made up of potential employers as well as also employees, encouraging match-making. Abdul, who had launched his company's first two mobile apps, said that he participated in networking to identify job opportunities he could pursue in case his startup didn't work out:

It's always good exposure to go to these hackathons and gatherings. I can tell everyone I meet about my startup, I can show off my skills, and maybe meet an

employer if the startup goes nowhere.

(Abdul)

A third respondent's testimony contributed to the conclusion that networks can increase efficiency in the labour market. Joyce, who had developed a farming application and was also a founding member of a women's networking group, explained that gathering spaces and events such as those facilitated by the iHub increased the likelihood of finding skilled mobile software developers:

iHub is the first place we looked for help because people who come here know the technology.

(Joyce)

This comment corresponds to an extent to some of the responses by Kathmandu entrepreneurs, who explained that they interpreted participation in networking events as a signal of skill; however, the observation that participation is evidence of self-motivation was not made by any of the Nairobi entrepreneurs interviewed. In addition to the iHub, which was mentioned very frequently, universities and colleges, and their job boards were named in a handful of interviews in discussions related to hiring employees or finding employers. Very few other networking institutions or events were named in the context of finding labour resources, which made the high frequency of mentions of the iHub an even more prominent phenomenon.

5.2.4. Financing: "We're Just Getting Used to the Idea"

Many of the respondents mentioned that they began working on their startups while still employed in "regular" jobs, and used the salary proceeds to fund expenses related to their entrepreneurial ventures. Others were students and engaged in part-time projects that brought in some income. A number of entrepreneurs noted that they were able to

keep expenses low in the initial phases by doing most of the work themselves and relying on resources they already possessed, such as a computer. The first significant costs were incurred in the process of acquiring equipment, such as computers, mobile phones for testing, and taking additional technical or business training. Some entrepreneurs reported borrowing or receiving money from family and friends for these specific, small purchases. Several respondents also mentioned that early customer revenues from a simpler version of a product were used to finance further development. Others, however, said that monetizing their mobile apps was very difficult, especially those aimed at individual consumers, which also involved higher costs, such as those incurred by marketing. Yusuf noted that entrepreneurs preferred to rely on word of mouth techniques to inform potential customers of their products in order to avoid high marketing costs.

To do [marketing] properly, it costs a lot. So we improvised and used online and SMS channels, and gave presentations, but [the app] wasn't being taken up. After that we realized [...] we had to look for outside funding and pay for advertising.

(Yusuf)

When they did decide to raise funds, entrepreneurs turned to family members, friends, acquaintances and competitions most frequently. Technology hubs, peers, and the Internet—specifically app contests—were also named as intermediary sources, i.e. sources of information that led to acquisition funds, including bank loans, competition prizes and small, seed-stage investments. Lawrence said that the total funding available for startups in Kenya was slowly increasing but that demand for financing was greater than the supply, and that few entrepreneurs could access substantial amounts:

In Kenya, we are just getting used to the idea of angel investment, VC investment, for startups. There is so much buzz about it, but you don't hear

about people getting big investments, other than some of the competitions, but even then it's small amounts. There is definitely a lack [of capital available to startups].

(Lawrence)

Very few of the entrepreneurs interviewed for this study received financing from angel investors or venture capital funds; however, a number of them mentioned a new fund being founded by some members of the iHub community and expressed optimism about the possibility of having access to that fund as a source of potential investment. Overall, entrepreneurs seemed to discuss their financing needs with their network peers, but, by the point the data for this study was collected, there was no evidence that these discussions or other activities within the networking context made a significant difference in terms of financing availability to mobile technology entrepreneurs in Nairobi.

5.2.5. Access to High-speed Internet: "Uninterrupted"

Broadband Internet was cited as an important input into the entrepreneurs' businesses in Nairobi. Here, again, technology hubs were found by respondents to be an important source of connectivity, along with family, universities and, occasionally, peers. Another consistency with findings from Kathmandu is related to the importance entrepreneurs placed on having uninterrupted Internet access for long periods of time. Grace, a female entrepreneur who also worked full-time for an established software firm, illustrated this point. Her words bear a close resemblance to the testimony of a Kathmandu entrepreneur, reported in the previous chapter:

It's not so hard to find Internet but it's expensive, or the place is too crowded, or the hours are too short. I need uninterrupted Internet for hours, and usually the hubs are good for that. I often work from my co-founder's house and we can stay up all night until something we're working on is finished.

(Grace)

The ease of accessing high-speed internet wirelessly in hubs, and the relative difficulty in securing an affordable, reliable connection elsewhere, played a key role in the popularity of iHub early after it was established. Prior to opening, founder Erik Hersman wrote the following:

Data connectivity is the most important aspect of the iHub, but after that comes a fresh design and an atmosphere that is conducive to techies getting cool stuff done.

(Hersman, 2010)

Many of the entrepreneurs interviewed also mentioned that the broadband Internet and working space provided by tech hubs in Nairobi was a source of competitive advantage for Kenya's mobile industry, pointing to neighbouring Uganda as a country with similar skill levels but no comparable institutions.

5.3. Risks of Networking: "Just Launch It"

The benefits of networking described above do not come without risks. In Nairobi, respondents identified risks that can be grouped into the four categories: idea theft, loss of time, loss of funds and loss of focus; however, compared to the benefits, the number of mentions was significantly lower, with fewer than half of the participants naming the risk of idea theft and only a few citing the risk of waiting of time, unnecessarily spending funds or losing focus. Still, the number of risks identified, as well as the number of mentions, was considerably higher than those in Kathmandu.

5.3.1. Idea Theft

The fact that idea theft emerged as one of the greatest risks is consistent with findings from the initial Nairobi focus group, where discussants identified their social network as particularly important at the idea stage, when developers are looking for advice and feedback on their plans for execution. Entrepreneurs reported that they face a dilemma at this stage related to whether and how much of their idea to share. Information exchanges in informal environments carry risks for fragile new businesses, in particular, the threat of idea theft, either by peers/direct competitors or by larger companies such as device manufacturers or network operators who, instead of hiring the idea generator to complete the work, could assign an internal team to develop the project in-house.

Nelson told the following story of just such an experience:

I have personal experience with my idea being stolen by a big company. [...] I approached someone I knew from there, we met at Mobile Monday, and I asked him if [Company] would be interested in an app idea, and if they would pay me to develop it. I had already sold some corporate apps like this before. He said 'yes, send me an email'. So I wrote the idea and sent it to him, and waited for a response. Next thing I hear, from another guy, [Company] developed this exact same thing in-house.

(Nelson)

Lawrence did not have the same concern about the relatively unstructured gatherings such as Mobile Monday, but spoke of his fear of rivals hearing about and developing an app he thought of first at during events such as hackathons or competitions, where apps are being developed in real-time. To prevent this, he said he keeps his ideas to a trusted circle:

I only talk to a few people I know very well [about the details of a potential project] if I have a great idea. It doesn't take very long to make an app, so as

long as you know there is some market demand, the best thing to do is just launch it and see what happens. If you talk about it too much, you waste time and someone else might do it faster.

(Lawrence)

The advice of entrepreneurs to one another to “execute” or “just launch” the mobile app was expressed by a number of other respondents, implying that working hard on one’s project was the strongest protection one could have against someone else doing it faster or better. This advice was given most often in the context of discussions about the risk of idea theft, but also appeared in considerations of other risks, such as the loss of time, funds, or focus.

5.3.2. Loss of Time

The risk of lost time was the second most frequently cited concern. In particular, entrepreneurs found the events organized by community networks to be of variable quality or relevance, and that while many gatherings are valuable to them, some were not. Further, respondents said it was sometimes difficult to predict which events would turn out to be useful, because this depended not only on the theme of the evening, but also on other participants who may or may not show up. Not knowing who will participate in the event, besides any formal guest speakers named on an invitation, for example, made estimating the risks of attending difficult. If a guest speaker was internationally renowned, other network participants were more likely to attend, including influential persons who could increase the value of attending. John shared the following:

We don’t need big names to come to Mobile Monday nights because of what they tell us, we need them because they get the crowd out. If we get a big wig from Google to speak to us, you know the government guys are going to show up, you know [mobile] operator guys are going to show up, so you have a

chance to talk to them and influence them.

(John)

In other words, presenters who are well-known and respected in the industry are not necessarily important, or at least not solely important because of who they are or because of the information they may deliver during a presentation; rather, their presence reduces the risk of loss of time for attendees. Entrepreneurs are seeking to connect with others in their network who can provide immediate help and resources and the probability that valuable members in the network will be present at a given gathering increases if a well-known personality also attends.

5.3.3. Loss of Funds: “Time is money!”

Related to the concept of time loss is the risk of forgoing income opportunities. Three respondents mentioned that participation in community events takes time that could otherwise be spent on developing a mobile app, and thus generating income. In

Rashid’s words,

Time is money! There are some people who are a fixture at these events, but I have things to do and there’s no time to network [makes quotation marks gestures with his hands] around when I should be coding, selling, hustling, making money.

(Rashid)

This explicit connection between the risk of losing time and the risk of losing income is illustrative of the pressure under which mobile technology entrepreneurs work, as well as of the high pace of work adopted by at least some of the Nairobi entrepreneurs.

5.3.4. Loss of Focus: “I May Abandon the Project”

Finally, two respondents said that they found the community socializing to be distracting, sometimes causing a loss of focus as a result of consultations with other members of the network. Samuel explained that this would occur if some of the network members questioned his ideas, causing him to consider alternative paths to building a product:

If I share my idea and someone starts to question it too much, then I will start to question it and I may abandon [the project] and do something else.
(Samuel)

In other words, the interactions experienced while networking had the potential to shake the confidence of an entrepreneur, resulting in a retreat to an earlier point in a decision-making tree, where more options need to be (re)examined. Thus, any progress in terms of ability to focus on pursuing one particular path may be lost. Since self-efficacy is of utmost importance in the entrepreneurial process (Davids, 1963; Timmons, 1978; Welsh & White, 1981; Sexton & Bowman 1983), it is not necessarily surprising that entrepreneurs try to avoid meetings that could lessen their confidence; however, the rarity with which this concern was expressed seems that entrepreneurs are not consciously aware of the risk, or at least not before they have experienced it first hand.

5.4. Nairobi Ecosystem Characteristics and Barriers

In addition to the topics of motivations for and risks involved in networking, Nairobi entrepreneurs discussed a number of other subjects. In particular, half of the interview

respondents mentioned the government as an influential actor in the Nairobi ecosystem, and nearly as many brought up difficulties in working with mobile network operators, who in many cases controlled channels through which entrepreneurs could deliver their apps to customers. A small number of respondents also talked specifically about the role of mobile operators in overcoming difficulties with reaching the poorest segment of the mobile market.

5.4.1. Role of Government

There are conflicting reports about government support, and especially the role of the ICT Ministry in growth of the mobile sector. In public interviews, government representatives have highlighted the importance of ICT for economic growth (e.g. Mulinge, 2012) and described the government's encouragement of private sector investment; certain officials have also been involved in many of the networking events, and some of the interview respondents spoke highly of the government's effort to promote the ICT sector in Kenya. However, many of the entrepreneurs and some of the focus group participants consulted for this study stated they felt left to their own devices when it comes to mobile technology entrepreneurship and that this feeling is what has led to their self-organization of the community between 2008 and 2012. For instance, Benjamin said he felt misunderstood as a coder and tech entrepreneur:

It takes some dedication and understanding what it is that we need, and the politicians are just not interested in the details; they don't have time, they have better things to do. They want to promote the tech sector but only on their terms.

(Benjamin)

Nelson was less diplomatic:

Policymakers moving in that direction [of supporting tech entrepreneurship], but getting into government you have to know someone who knows somebody, who knows someone. All those people on the way down need a piece of cake, and things like startups are not very lucrative [...] [so] it's not worth it to them.

(Nelson)

Lack of government support was also said to be related to the fact that insufficient access to broadband – identified as highly valuable by respondents - continued to be a hurdle for Kenyan entrepreneurs, despite new fiber optic networks having been laid out throughout the country in 2010 and 2011. Prices for accessing broadband networks have remained prohibitively high, as even the government's own reports conclude (Kenya ICT Board, 2012). Other barriers include the high cost of mobile handsets, especially with 3G capability (used by smartphones, and necessary for mobile broadband Internet connectivity) and the associated expenses with their operations, including network access.

5.4.2. Role of Mobile Network Operators

Further obstacles to mobile entrepreneurs' success cited include “unfair” operator revenue sharing schemes and high costs of USSD – a technology used mostly on simple GSM phones to establish a real-time connection with the network, allowing for applications that require faster data transmissions than SMS can provide

(TelecomSpace, 2010). Rashid stated the following:

Operators can give you access to customers via their app stores or even pre-installing your app. But the revenue sharing schemes are completely unfair to the developer. They get 40, 50, 60 per cent [of revenues]; if your app is drawing on content from a content provider or aggregator, you have to split the remainder [with them]. [The profits are] very low.

(Rashid)

Justin commented on the differences in cultures between startups and operators, and explained that network operators were large and bureaucratic, while startups were focused on results:

I don't like processes. The way I see it, I could spend time coding instead of following their processing. My motto is "just do it." For the processes, you need someone who understands it and is patient enough to go through it, but that's not normally someone in a startup.

(Justin)

Another part of the entrepreneurs' grievances about network operators is related to the fact that many operators' billing practices are not transparent and that APIs (application programming interfaces) operators use for billing customers are inaccessible to entrepreneurs. Joyce explained the situation this way:

Operator APIs are mostly closed, and so they control all the billing. If they would have some transparency, if they open APIs, many more developers could sell their apps directly, and could have more say in how revenues are shared.

(Joyce)

Other developers across Africa have called for opening of billing systems, pointing out that this would likely result in increased overall revenues for operators, as more apps become available due to increased motivation for mobile apps entrepreneurs to produce them. In the words of Ajibola Aiyedogbon, a mobile entrepreneur from Nigeria:

If telcos give us open API's to bill users by ourselves it will encourage more app developers into the market and we will develop even more apps to make data consumption even more attractive and that will generate even high revenue for the telcos and for the app developers.

(Ajibola Aiyedogbon in Narku, 2012)

A special role for the network operators was identified in relation to the "base of the pyramid" segment of the market, or users who live on less than \$2.5 per day as defined

by the World Bank (2012). In this market, voice-based applications are preferred over textual ones due to literacy concerns, and the affordable devices used by this demographic have very limited capabilities. Further, electricity needed for charging mobile phones is not readily available, so entrepreneurs must consider energy-intensity of their products (Zainudeen & Ratnadiwakara, 2011; World Bank 2012a). While networking groups and hubs can help entrepreneurs ascertain and articulate the systemic challenges such as these, overcoming them would likely require involvement of mobile operators or other organizations on whose existing infrastructure mobile technology entrepreneurs are heavily reliant in this context. As Njeri mentioned:

Many farmers and other users in rural areas who are very poor simply can't afford to pay for apps, so some kind of alternative arrangement needs to be made, with the operators or sponsors, to reach this market segment.

(Njeri)

While it seemed that most entrepreneurs shared the conclusion that mobile network operators were, on the whole, the source of barriers to their success, and did not understand how they could benefit from promoting locally developed mobile applications, Yusuf said that things were changing for the better, due to the popularity of the overall mobile technology ecosystem:

It used to be worse. [One operator] used to block our app. Things have now improved, more and more excitement is coming from Silicon Valley and people are yearning for a local ecosystem that is globally relevant, so the operators are starting to pay attention.

(Yusuf)

The implication that the story of Silicon Valley is influencing not only entrepreneurs, but also network operators, contributes to one of the main findings of the study, discussed in more detail in Chapter 8.

5.5. Emerging Themes

There is a striking similarity between the emerging themes based on data collected in Nairobi, and that from Kathmandu, although several important differences can also be seen. The first is related to the prominence of community efforts in the mobile technology ecosystem. The observation that tech hubs and networking groups fill the gaps in entrepreneurship support left by traditional institutions is even more easily made in Nairobi than in Kathmandu: nearly all entrepreneurs interviewed in Nairobi frequently mentioned a type of institution while describing their networks. The institutions cited were not traditional government or industry bodies – although they were reported to provide links with such entities – but were themselves emergent and entrepreneurial. These had come to be known as tech hubs and meetup or networking groups. As discussed above, iHub was named repeatedly and consistently as a valuable part of the entrepreneurs’ social network and the mobile ecosystem in Nairobi. An overview of Nairobi’s tech hubs and networking groups in section 5.1.2. enumerates the most prominent such hubs and groups and subsequent discussion in this chapter has highlighted their focus on community-building. A handful of what would be considered traditional institutions, such as universities, were also found to be using newer, flexible methods for engaging with mobile innovators, with the University of Nairobi and Strathmore University having provided mobile programming “bootcamps” several times a year since 2006 (Jaschke, 2009). It should be noted that the entrepreneurs themselves do not seem to separate institutions such as hubs and networking groups from individual contacts; on the contrary, hubs and networking groups are consciously seen to be made

up of friends, peers, acquaintances and mentors who are the ones to connect entrepreneurs to other sources of information and financing, and who, as the case of the iHub founders shows, can join with one another to found a new co-working space or a financing mechanism. In other words, these new networking institutions are a product of reciprocity and mutual reinforcement between the individual members and inseparable from them.



Figure 9: Illustration of the iHub Space: the flexible furniture configuration allows different activities to take place. Here, women programmers with the Akirachix networking group talk in small groups after a workshop on software security.

One of the reasons behind the popularity and success of community-driven initiatives are the limitations Nairobi entrepreneurs face, despite the many resources provided via their personal networks. For instance, their families and friends may not

understand the concept of entrepreneurship, or if they do, may not be supportive of their decision to pursue uncertain returns at the price of foregoing wages earned from employment in an established company, which technically skilled entrepreneurs can obtain more easily than the average job seekers. This societal pressure tends to reduce the number of entrepreneurs as well as their potential employees, contributing to an already significant lack of skilled labour available to startup founders. Further, even if their families are generally supportive, the closest social connections of entrepreneurs may lack the relevant skills or knowledge entrepreneurs seek in the process of building their startup; an institution like iHub can assist with locating potential employees, whether by connecting entrepreneurs with technology graduates or providing space for training of those who lack technical skills. Finally, even if resources such as Internet connectivity and electricity are available in their homes, educational institutions or places of employment, using them effectively can be difficult due to interruptions in service or other distractions. Thus, a community-focused institution such as the iHub, provides a “safe” space—in terms of acceptance by their peers but also in terms of certainty of availability of office space and Internet connectivity—that is difficult to find elsewhere.

A second finding is related to the first, in that, as in Kathmandu, the networking community and the networking institutions in Nairobi seem to be inspired by the Silicon Valley environment. Three sets of facts lead to this conclusion: one, the region was referred to explicitly in a large number of interviews; two, many of the terms used to describe networking in Nairobi were consistent with vocabulary widespread in Silicon Valley; and three, entrepreneurs named specific well-known California-based

technology companies as influencing forces for the Nairobi entrepreneurs. Thus, the data collected for this study indicates strong aspirations to recreate at least some of the features of Silicon Valley.

Third, although Nairobi entrepreneurs were cautious when deciding how much of their ideas and plans to share, and seemed generally more aware of the risks of networking than their Kathmandu colleagues, it seems that the perceived benefits of networking outweigh the perceived risks involved in sharing and cooperating with individuals they do not necessarily know well. To minimize the risks, and maximize the benefits, entrepreneurs seem to develop coping strategies, including choosing to share limited information about their ideas and ventures, or selecting to participate only in certain social occasions, in which interactions with individuals who could help entrepreneurs obtain resources is most likely.

The most interesting of these findings is related to technology hubs, and iHub in particular. No other site of informal gathering has been singled out so strongly: for the Nairobi respondents, technology hubs are the most important source of the majority of relevant resources. A comparison of the hubs and their features, as well as examining the evolution of tech hubs over time, would be useful next steps in the effort to better understand mobile technology entrepreneurship in Nairobi and around the world.

5.6. Chapter Summary

Like Nepal, Kenya is a low-income country, however, its history and geopolitical situation provide some advantages of consequence to technology entrepreneurs. Kenya has a tradition of trade and entrepreneurship, and it has experienced

significant growth of mobile technology infrastructure and mobile device adoption. In particular, Kenya is known for its widespread use of mobile money, which has allowed customers to view mobile phones as more than communications tools, making them more likely to use other types of mobile software applications. A high percentage of Kenya's GDP is connected to the mobile industry, signifying the deep integration of mobile technologies into the Kenyan economy.

Social networks were found to play an important part in acquisition of resources by Nairobi's entrepreneurs. The entrepreneurship community, which is nurtured through these networks, helps with acquiring individual skills related to self-efficacy and with legitimizing entrepreneurial activity. The formalization of networking activities has led to the formation of tech hubs and regular groups that fill the gaps in support created by lack of dedicated institutions. Of these, iHub Nairobi is the most prominent. The iHub and other similar institutions provide a gathering place for a supportive community of entrepreneurs and other ecosystem actors, including mentors and investors. Notably, they often incorporate many design elements, terminology and startup management methodologies modeled after those developed or used in Silicon Valley. These include open spaces designed to increase collaboration among members, the use of colour, games and technologies aimed to encourage creativity, nomenclature for events, such as Demo Night, and startup management methodologies, including Lean Startup. In addition to tech hubs, evidence of Silicon Valley as a model of influence in the behaviour of entrepreneurs was found in interview data. As in Kathmandu, Nairobi respondents spoke in comparative terms, expressing hope that more angel investors and venture capitalists would become active in Kenya's

entrepreneurship ecosystem, and noting that global brands, such as Google, Apple and Nokia, were a source of inspiration.

Nairobi entrepreneurs reported a great perception of risks than their colleagues in Kathmandu; they also said that they cope with such risks by limiting the sharing of their ideas with others only when the benefit of sharing is immediately apparent.

Finally, Nairobi entrepreneurs indicated a number of significant challenges including a labour shortage, difficulties with monetizing mobile apps (despite widespread use of mobile banking), unreliable Internet access, and challenges involved in working with network operators.

The themes emerging from the case are centred on the role of tech hubs in the evolving entrepreneurship ecosystem. These hubs are popular with entrepreneurs because they provide the infrastructure necessary for their work, along with a gathering place for a supportive community of peers and other ecosystem actors. The hubs act as physical cornerstones of the process of institutionalization of entrepreneurship and, in their design and function, symbolize the model for that process, that of Silicon Valley.

6. Networks of Mobile Technology Entrepreneurs in London

In many respects, London is very different from the cities of Kathmandu and Nairobi. As a global financial center, the capital of one of the world's most developed economies, and one of Europe's creative hubs, London provides many opportunities for entrepreneurs, as this chapter will show. Further, in contrast to Kathmandu and Nairobi, which suffer from considerable ICT infrastructure, policy, and industry-related challenges, London's mobile ecosystem is among the most advanced in the world. Analyzing the experiences of London's mobile technology entrepreneurs alongside those of Kathmandu and Nairobi is valuable for drawing conclusions about entrepreneurial networks generally, and for distinguishing between characteristics unique to each of these three environments.

6.1. Mobile Entrepreneurship Ecosystem Overview

London is Europe's—and, therefore, also the UK's—most populous city (Eurostat, 2012). It is also the most dense British urban centre with the fastest growing population. In 2011, London's population of approximately 8,174,000 (Office of National Statistics, 2012) was more than 10 times that of Kathmandu, and more than two and a half times that of Nairobi. Its economy contributed a fifth of the UK's Gross Value Added (GVA)⁵. In 2012, the UK was the eleventh-largest exporter in the world (Central Intelligence Agency, 2012b), and the fifth-largest importer (Central Intelligence Agency, 2013). In the same year, the country received approximately 4% of the world's

⁵ Gross value added, or GVA, is defined as GDP net of taxes and subsidies. See Office of National Statistics, 2013.

foreign direct investment (FDI), making it the fourth largest recipient, and it invested just over 5% of the world's FDI abroad, making it the fourth-largest investor in other countries (Organization for Economic Co-operation and Development, 2013). The service industry, including the prominent financial sector, dominates the economy, having contributed 78.5% of GDP in 2012 (Central Intelligence Agency, 2012b). London itself is the fifth largest city in the world in terms of economic “gross value added,” (Office for National Statistics, 2012), the largest city by GDP in Europe in 2011 (Eurostat, 2014), and, alongside New York, the world's largest financial centre (Z/Yen, 2012). London's emerging technology-based businesses have been identified as one of the top two contributors to the future growth of London's economy by the research institute Centre for Economics and Business Research (2013). Given such strong performance across a range of economic indicators, it is not surprising that, in 2012, London was also the city with the highest number of businesses (Department for Business, Innovation and Skills, 2013) and of business startups in Britain (Centre for Cities, 2014)⁶.

6.1.1. Mobile Industry

In the same year, there were more mobile phones than people in the UK. A report by Ofcom indicated that there were 129.8 active mobile subscriptions per 100 inhabitants in the country (2012). The report described rapid growth in the number of mobile subscribers in the country who accessed the internet using their mobile phones, tablets, dongles, or other mobile devices. In particular, 40% of mobile users said they accessed the Internet via a mobile device, translating to 32.6 million mobile Internet users—

⁶ Note that no data is available for 2011.

quadruple the number of users in 2009, when the number was 11% or 8.4 million. Further, many people used smartphones to access data online, which Ofcom ascribed to better availability of broadband mobile networks, an increase in the comfort of users with mobile internet technologies, and a greater number of websites adapted to mobile platforms. Another interesting finding by Ofcom was that machine-to-machine (M2M) mobile connections were 24% more prevalent in 2012 than 2011, indicating that growth in data transmission over mobile phones was also aided in this way (Ofcom, 2012.). With such an active economy, high mobile penetration rates, and growing mobile internet use, the UK, and London in particular, is a favourable environment for startups focused on mobile technology, as the next section will show. London's high levels of migration trends and reliable transport also support global connections for its workforce.

6.1.2. Environment for Technology Startups

According to Tech Britain, a British open data project that aggregates data about startup activity across the country, the UK entrepreneurship ecosystem consisted of 53 major centres, with London being by far the most prolific in terms of startup companies and investors (2013). In November 2013, London had 1,265 known tech startups, followed by Manchester (54) and Cambridge (38). Most of the London startups were located in the eastern areas of the city, close to the Old Street circular intersection. The term "Silicon Roundabout," as the neighbourhood is nicknamed, is indicative of the frequent comparisons to Silicon Valley, widely considered to be the best known technology startup ecosystem in the world. In addition to the technology startups, the area is well known for media and design companies, along with co-working spaces and shared

office buildings that house them. In 2012, Google Inc., an American multinational company specializing in internet-based keyword search, cloud software, and online advertising, acquired and expanded TechHub, London's first co-working and event space devoted to technology startups (TechHub, 2012). Other co-working spaces, incubators and accelerators (organizations that support startup development through intensive training, mentoring and "seed" financing), have also contributed to the recognition of Silicon Roundabout, and London more generally, as a hospitable location for founding a technology company. Examples of such organizations include Passion Capital, Seedcamp and Techstars. Specialized incubators focusing on financial technology, or "fintech," startups have also been established, including Level 39 and Barclays TechStars.

In addition to incubators and hubs that act as community nodes and organize events, there are hundreds of other regular networking groups relevant to mobile industry entrepreneurs, some of them mentioned in the figure below.

Practical Entrepreneurs | London Mobile Web Geeks | Mobile Backend Apps and APIs | Mobile and Social Marketing London | Monetization and Promoting Mobile Apps | Mobile Learning | London Mobile Developers Networking | London Mobile Music Makers Meetup | AppsMania | AppsTalk | It's all about APIs | API Academy Summit | London Appreneurs | DevLatest | AppFusion London | agencymobilise London | AppsJunction | Firefox OS London | Girl Geek Dinners | Mobilise | Mobile and Games Dev | London Mobile Web Meetup | iOS User Group | The London Android for Beginners | London App Marketing Group | London Lua User Group | South African Developers in London | Polish Developers in London | Couchbase London | Startup Socials London | The London Educational Games Meetup | X-Dev London | AppDevUK | UX Cafe for startups | #techMAP London | London Android LiveCode | London Game Developers | Italian Developers in London | Portuguese Speaking Developers in London | The Adobe & Web Open Source London Meetup Group.

Figure 10: Examples of London's Networking Groups for Mobile Entrepreneurs (Meetup.com, 2013; entrepreneur interviews)

The GSM Association, an industry body that represents mobile operators using the dominant GSM standard, too, organizes networking events, contests and activities from its London headquarters. According to Jari Tammisto, the CEO of Mobile Monday Oy, London is also home to one of the most active chapters of the global networking organization for the mobile industry founded in Helsinki in 2000 (personal conversation with Jari Tammisto). The goals of the London chapter's members resemble closely the founder's original vision for the broader organization: providing informality, fun and an

emphasis on working with key players to “do good things” in emerging markets and industries related to mobile technology. Mobile Monday London is described in the following words:

Mobile Monday London (MoMoLo) is an informal networking group based in London, England. Our aim is to share experiences of financing, building and deploying and running mobile products and services. We invite lively discussion on this mailing list and we organise monthly knowledge and networking events around topics and trends of interest to the UK mobile industry.

(Mobile Monday London Online Discussion Group, 2013)

Counting approximately 8,000 participants, the London chapter is one of the largest of the 140 worldwide (Mobile Monday London, 2013). It organizes twenty to thirty events per year, including informal gatherings of mobile technology professionals and enthusiasts over drinks; panel presentations on a particular theme, usually sponsored by a major mobile industry corporation; competitions, social gatherings, and even mobile technology-inspired theatre productions, tied to major global industry events such as Mobile World Congress, held annually in Barcelona; and the Mobile Monday Academy, a ten-week evening course that provides “an overall grounding in business, design and how to work with technology” (Mobile Monday Academy, 2012).

In 2010, local and national governments, along with companies Vodafone, Google, Facebook, Intel and McKinsey & Co, announced plans to invest in the East London’s technology cluster (Prime Minister’s Office, 2010). The UK government offers a number of complementary programmes for entrepreneurs and startup investors. Among them are tax incentives for early stage individual investors, known as angels; tax credits for research and development activities of small businesses; a three-year entrepreneur visa; “Start Up Loans,” a lending and mentoring scheme; “Patent Box,” an

intellectual property incentive scheme; “Entrepreneur First,” a business idea competition for recent graduates; and “Future 50,” a programme that supports the most promising startups founded by 20-35 year olds (Smale, 2013; Financial Times, 2012; Shead, 2013). In addition, there are education initiatives that provide schoolchildren with opportunities to learn how to write computer software at an early age, and private programs, such as Apps for Good, that encourage teenagers to develop applications related to social causes.

Startup Genome, a research firm that provides data on new technology firms via an open platform, estimated London to be the second best place for entrepreneurship support in the world, behind Silicon Valley (Startup Genome, 2012). According to the firm,

London [...] has become the most successful startup ecosystem in Europe, producing the largest output of startups in the European Union by far. . . London looks to be well positioned for continued growth as the leading startup ecosystem in Europe, and first choice for fast-growing US startups to establish their European headquarters.

(Startup Genome, 2012, p. 47)

The same group has found that the number of technology start-ups in London’s Old Street neighbourhood increased by 700% between 2009 and 2012, and that many founders who conceived their new ventures abroad chose to relocate to London due to the opportunities available (Startup Genome, 2012). Many entrepreneurs interviewed for this study singled out the eastern parts of London as the heart of the tech ecosystem. James, an entrepreneur who had established a successful media startup and was working on a new, mobile app business, said the following:

Shoreditch is becoming like a little entrepreneurial village with its own High Street. You can just walk down or cycle down to cafes, other startup offices. Our

lawyer just moved here too. [...] It saves time and it provides this incredible richness of perspectives by people who are willing to help you and are kind of in the same boat.

(James)

Another respondent, Miles, had worked for banks and other financial institutions as a programmer for decades, before deciding to pursue an idea for a mobile software platform with two coworkers. He said that many changes had occurred over a short period of time, and described the evolution of the area since the late 1990s this way:

Contrary to what people will tell you, the East End has always been a fascinating place, but it used to be a really poor area, with low-wage workers in garment factories, food distribution, stuff like that. With the boom in the 2000s, a lot of people were squeezed out of central London and came to Shoreditch. Artists, media creatives, and designers were the first, and then the tech startups joined them. Now, East London is completely mainstream. [...] If you want to be cool, you have to go somewhere else. But if you want to run a tech startup, there is no better hub in all of Europe.

(Miles)

An investment monitoring service provided by the Financial Times, fDi Markets, found that London attracted £4.04 billion worth of investment in 602 technology projects between 2003 and 2013, creating 19,476 jobs (Financial Times, 2013), contributing to the evolution of London as a centre of entrepreneurial activity. The story of Andre, a relative newcomer, indicated that, however impressive in global terms, the startup community remained relatively small, and focused to one part of the city, East London:

This is my third company. I started the first two in Paris. They are all related to payments in the hospitality industry. [...] I came here because of the many great opportunities in hospitality. In London, at first I didn't know many people, but the community is very friendly and I was able to build a good network over the past year. [...] When I first got here, I lived in Ladbroke Grove, which is well connected. Then I realized I was commuting to East London every single day for months. London is a big city but the community is still small and they are all

huddled around Old Street.

(Andre)

The environment for London mobile industry entrepreneurs is vastly different from that in Nairobi, and even more distinct from the setting for networks of Kathmandu's mobile entrepreneurs. Yet there are surprising similarities among them, as well as striking differences, as the following sections show.

6.2. Motivations for Networking

In contrast to respondents in Kathmandu and Nairobi, many participants in London did not specifically mention their networks as sources of resources until prompted.

However, as they spoke, it became evident that respondents in London did not omit networks from their descriptions due to a perception that networks are unimportant; rather, respondents considered networks so important that they simply took for granted their significance for the fate of a startup. When prompted, many participants made specific comments about the strength of the mobile tech community, the numerous opportunities to meet others in the industry, and the approachability of other entrepreneurs, potential partners or investors. Entrepreneurs explained that networking was crucial for a new mobile technology business as well as unavoidable as one of the only sources of current information in an environment that was constantly changing, with new people frequently arriving and others leaving. Miles, mentioned above, noted that the quick pace of change was a relatively new phenomenon, and that it had become more difficult to keep track of the actors in the London ecosystem:

The [London tech startup] scene has grown quickly. Even two, three years ago, you kind of knew [...] who's who. Now every night there is a new startup.

(Miles)

The sheer size of the community made networking more difficult. In particular, while most respondents said networking was very useful in general, a number also admitted that discerning which events would be relevant to them was often challenging. The following sections explore the tradeoffs, i.e. the motivations and risks associated with entrepreneurial networking in London.

London interviews revealed that entrepreneurs rely on networks for many resources and that working in isolation seems unimaginable to most of them. Entrepreneurs' goals when networking in London centered on obtaining resources, grouped into categories similar to those arising from data from the Kathmandu and Nairobi cases: community support, labour, finances, knowledge and broadband Internet access. London entrepreneurs also identified reasonably priced office space as a particularly scarce resource, grouped below with the discussion on Internet access. In addition, perspectives of women entrepreneurs, and a discussion of tech hubs are also included as subsections that relate broadly to resource acquisition through networks.

6.2.1. Community: "Countless" Networks and Clustering around Old Street

The ability of entrepreneurs to receive social support or moral encouragement from their networks was found to be crucial in all three cities, including in London. Many of the respondents categorized the London startup community members as generous and supportive. Brian, whose startup aggregates news stories from around the world and sorts them according to user-defined categories, explained that he often had to work at night because his business partner lived in Asia. He said that he often felt alone in the context of his startup, but that the community made him feel like he could count on help when he needed it. He provided this example:

It's a supportive community. There are rivalries, for sure, but for example a few months ago, I was working at the office by myself around 2am and went out for a smoke. Then I realized I locked myself out. Out of frustration, I just tweeted about my stupidity and one of the chaps from a different startup in the same building saw the tweet and offered to cycle over to let me in. It was the middle of the night and he lives 20 minutes away.

(Brian)

Lisa, an American computer scientist-turned-entrepreneur, described the networks as open to newcomers, and relayed his own experience of building a supportive network:

It is beyond easy to meet people [in London]. I have been here for four years. [...] Originally, I moved here from New York for a job with a [software company] but I decided to leave and build a startup with an Indian colleague. We [...] didn't really know many people at the time [being new to the city], but there are so many events and so many helpful people, that we have really built a little community [of people who] help us regularly, and we help them.

(Lisa)

A number of respondents spoke of the connection between risk-taking and the moral support they receive from their peers, suggesting that their risk appetite would be much smaller, if it weren't for encouragement from fellow entrepreneurs and other members of their community. In the words of Lukasz, another entrepreneur who moved to London from elsewhere:

The best part of the London scene is the support. People are ready to jump in and take a risk. There are other people doing what you're doing and the whole concept is acceptable. In Poland, you don't get that buzz. People think you're crazy for giving up a decent job to build some sort of mobile app. Not everyone. But the default response is "are you mad?" Here, it's "good for you."

(Lukasz)

The sense of support and encouragement by peers was reported by over half of the respondents, and its importance did not seem any smaller than in Kathmandu and Nairobi, in spite of the fact that London is a much more populous city, and arguably an environment in which individuals are less dependent on informal communities.

6.2.2. Knowledge: “Diversity of Perspectives and Experiences”

Most of the London entrepreneurs interviewed said they relied on a variety of institutional sources to obtain relevant knowledge and information, including market research publications, consulting firms, and universities and many such responses echoed those in Nairobi and Kathmandu; however, London entrepreneurs singled out local networks as useful for providing a particular type of knowledge unique to London, which one respondent termed “global perspective.” The same respondent, Lukasz, also mentioned the benefit of London’s time zone for an internationally minded startup team.

There is no question that if you want to build a global business, it’s better to do it here than anywhere else because of the diversity of perspectives and experiences from all over the world; and if you’re building a mobile business, you may as well make it global [since mobile penetration is widespread]. Even the time zone is friendly both to Asia and to North America.

(Lukasz)

Marcus, another respondent who moved to London from continental Europe, considered London to be a global centre important to the industries their mobile startup aimed to serve, in particular fashion, design and the financial services industries. As such, he described the city a source of valuable sector-specific knowledge and clients he could not easily find elsewhere.

I came here from Berlin, [having left] because it was rather difficult to do business in Germany, because they didn’t really understand what we were doing. Our product is for the textile [fashion] industry, so we also have more clients here and so far we have met more investors who get our business.

(Marcus)

The availability of global knowledge (including familiarity with markets, but also language skills and cultural understanding) and the existence of personal global industry

links in London's labour force was reported to be one of the most important assets for a startup focused on international markets.

6.2.3. Labour (Talent) Constraints: "Not Easy to Hire"

Many respondents cited technically-skilled employees or co-founders as the most difficult type of resource to secure in London, and most explained this difficulty as a factor of the financial industry's presence in the ecosystem. Karen, a repeat entrepreneur, said her hiring efforts for her latest company had not proved fruitful:

I advertised online, and I told everyone I met that I was looking for a technical co-founder. I interviewed three [candidates], all of whom came recommended, but they all decided against pursuing the opportunity in favour of banking jobs.
(Karen)

Even when they were successful at hiring highly skilled employees, entrepreneurs said it was difficult to retain them due to more competitive wages in other sectors. Courtney, who recently launched her first company, was generally pessimistic about London as a place to build a new business, said the financial industry made it difficult to hire programmers:

The [financial industry] City gives such high salaries to developers, we couldn't possibly compete. One of our early employees quadrupled his salary, like, literally overnight, by going to work for Barclays.
(Courtney)

James, who had a generally more positive outlook and was working on a second startup (as mentioned above), said the labour shortage for technology startups had a direct effect on his ability to focus on other aspects of the business:

I fantasize about it [laughs]. The best software engineers are knocking on my door constantly, I open the door, [...] they rush in, sit at the desk and start

making beautiful code. Then I wake up [laughs].

(James)

While most respondents relayed similar sentiments, a few noted that the problems related to finding skilled labour were particularly acute in the growth stage of a company. Andre shared the following:

[...] it's hard to go from a startup to a competitive firm, and that's because of lack of skills. We have 16 openings right now. We have had 10 of those 16 openings for more than three months. [...] I am going to America this week to interview people because we just can't seem to locate the right talent here. It complicates things, because even if we find the right people, will they be able to move here? Will they be able to sort out visas? Lack of skilled engineers is the bottleneck.

(Andre)

Some respondents suggested that the situation could be remedied, at least in part, by better integrating local universities into the local startup communities and networks. Karen said that better institutional links should be made between the London "tech city" community and nearby universities, similar to the relationships between such institutions in the Bay Area:

The big banks and consulting firms all have their pick of the best graduates. There should be a way for entrepreneurs to attract some of that talent, and also to better communicate with universities. Silicon Valley and Stanford are practically inseparable, but we don't have that kind of relationship with LBS, LSE, Imperial, UCL, etc.

(Karen)

Not all respondents agreed on this point related to the labour shortage. Some noted that being based in London did not limit the talent pool to their local networks, but rather opened it up to international candidates. Marcus shared his recent experience with hiring, which was more positive:

Our startup has hired five people in the last two months. We interviewed over 50

candidates, mostly over Skype, a lot from America, a couple from Germany, a couple from Israel, a few from random places all over the world. In the end we hired four who were based in London and one guy from Germany.

(Marcus)

This finding seems in line with the comments reported above related to the presence of a “global perspective” in London’s business circles. Lisa, originally from the US, reported having successfully recruited from the financial industry itself, although this response was an exception to the sentiments expressed by most other respondents.

The idea that the financial industry is somehow hindering startups is an excuse. We have recruited from The City. Our lead developer has been there, done that, and prefers a startup life.

(Lisa)

Finding programmers who were interested in a startup career was difficult for other respondents, such as Karen, who explicitly and repeatedly complained about the lack of developers with a passion for early stage companies. She said:

Financial and media industries are huge here, and they have the ability to pay more for developers. [...] Missing [...] are [software] developers who are passionate about startups, who aren’t after a traditional job, despite the pay.

(Karen)

This comment was similar to the observation by a Kathmandu respondent that participation in networking groups revealed a degree of self-motivation desirable for a startup with limited ability to provide monetary incentives; however, Karen did not think that networking alone provided a solution to the problem of motivation because developers had very lucrative options that were likely to lure them away even if they possessed a level of curiosity or interest in startup jobs. James noted that the difficulty in finding suitable candidates was not confined to London, while inadvertently also providing additional evidence of the London community’s global perspective:

It is not easy to hire here. It may be easy to get lots of resumes, but to attract the

right CTO or lead developer is very, very hard. That's not the case just in London, that's the case in Silicon Valley, that's the case in New York, and anyone you hear telling you otherwise is repeating some kind of Tech City government propaganda. The best of the best have lots of opportunities and they are picky. It took me over six months to find a CTO. [...] And [now that he joined our company], I can't delude myself thinking he's not getting calls every week from other companies. He is. It's very hard to hire the right guy [...] for the job and hard to keep them.

(James)

James also provided the following example to show the magnitude of the problem:

I've come across some dodgy recruiting schemes for co-founders and early employees. There is so much demand for talent that it has given rise to a little cottage industry of startup matchmakers, and some of it is not pretty, crossing all kinds of privacy lines. For example, one app asked to be allowed access to my [social media] account to verify my identity, so I said yes. Then they proceeded to spam my [...] contacts with emails that looked as if I had written them.

(James)

While the majority of respondents shared the view that finding employees and founders was difficult, a significant number of others held the opposite view. Some of them were very optimistic about London as a location for startup hiring. Laura, who completed a computer science degree and worked as a programmer before founding a company, said that her experience with hiring has been surprisingly positive:

It's a great place for startups to find talented developers and designers. We are in the middle of a hiring push and people we have been meeting have been very impressive.

(Laura)

Lisa shared a similar sentiment and said that the availability of potential employees with specialized knowledge, for instance, of the Nigerian market, was an attractive feature of London's labour market, once again providing an example of the international nature of London's networks:

The talent pool is amazing. You have this mix of people from all over the world – Africa, Asia, Europe, North America, Brazil, India. [...] Everyone has a different perspective or speaks a different language so when you have a problem, it's not hard to find someone who can solve it. It's very, very useful for a global business. Also, it's way more fun, so it makes it easier to persuade people to take a low paying job [laughter]. If we were in, say, Indianapolis, it would be harder to get someone with deep knowledge of the Nigerian market who is also a BlackBerry developer.

(Lisa)

Isabel, an experienced entrepreneur originally from Sweden, said her team competed for labour without cash remuneration, compensating employees instead with a share in the ownership of the startup. She said that London provided access to talent that was not easily available elsewhere:

London is unsurpassed when it comes to talent. Within a few hours' drive, you have some of the smartest students graduating from top universities, whether with technical degrees, or MBAs. At first, our entire team of six worked for equity, which was non-existent when we started, so they worked for free, some of them nearly a year. These were [...] people looking for experience with a startup and [who were] passionate about our products. I could not have built the company without them, and I could not have found them in many places other than London.

(Isabel)

Some respondents contemplated the risk involved in the decision to work for or found a startup, and weighed it against the associated motivational factors, or “upsides” of the risk, which made the risk worth taking. Two of the most interesting observations concerned such motivational factors, including direct enjoyment of the work involved and the autonomy to make consequential decisions for their companies. Brian, whose experience was with a major media corporation, said that one reason he became an entrepreneur was to avoid boredom:

Almost every entrepreneur in London I met has held a very good corporate job and they feel like they could go back to the corporate world if [entrepreneurship]

doesn't work out for them. The reason I left is that I was, quite frankly, bored. And I could afford to take a risk and fund it myself for a while from savings. [...] I haven't looked back.

(Brian)

This comment indicates that at least some entrepreneurs in London were able to personally finance their ventures, a practice known as “bootstrapping,” at least for some time. Given the high costs of living in London, it would not be unreasonable to conclude that such entrepreneurs belong to a particularly wealthy demographic group.

Another respondent, Simon, had moved to London from the United States for a job in investment banking. He saw the global financial crisis as an opportunity to try entrepreneurship at a time when his opportunity cost was low and also highlighted the rewards of working for oneself:

With the global financial crisis, choosing to become an entrepreneur isn't very risky – you might not be giving anything up. We thought, why not use this opportunity to do something more interesting, self-directed, more fun.

(Simon)

Even though the personal situations of the two entrepreneurs quoted above were very different (one respondent could afford to quit a well-paying job, while the other had nothing to lose), both participants singled out the appeal of “more interesting,” “fun” jobs. The idea that crisis may inspire people to start their own businesses was evident in the following story told by Simon:

My co-founder and I worked in investment banking until 2011, and then we were let go because our entire department was shut down. The whole team, and our boss, twenty people altogether, we were given six months' salary and told to hand in our BlackBerrys. So a few of us started meeting twice a week, once for lunch and once for beers, just to keep up morale. During these meetups, John and I started talking about doing something else. [...] Being bankers, we were pretty risk averse and we had some connections in the industry. So we settled on facilitating transactions via mobile phones, because it seemed straightforward

and all of our friends thought it was a good idea.

(Simon)

Despite such positive accounts, the overwhelming sentiment related to the availability of labour in London was that finding technically skilled employees or co-founders was a great hurdle to building a successful business in London, second only to securing financing.

6.2.4. Financing: “Investors are Risk Averse”

Remarks about obtaining early-stage financing, a perennial challenge for entrepreneurs, revealed a wide variety of experiences. Networking groups were mentioned in the context of first connecting to angel investors and venture capital firms; many respondents, however, complained that it they found it extraordinarily difficult to raise funds even after personal introductions to potential investors. Respondents theorized that this difficulty centered on the culture of London’s traditional financial industry, which did not encourage risky investments. The experiences recounted by respondents varied greatly in terms of the stage of financing in question. Karen shared the following view:

Early stage capital is difficult to source here. Investors are very, very risk averse, and if they consider a mobile startup, they flock to later stage deals.

(Karen)

James noted that smaller sums are relatively easier to obtain, but that follow-on financing is harder to find:

It was relatively smooth sailing to raise the first £100,000 but then we hit a brick wall.

(James)

Brian, who spent all of his personal savings on his startup, due to a lack of financing,

and whose co-founder moved to Asia to lower costs, said the lack of early-stage financing caused the company to rethink its strategy and slowed down their progress:

We had a really hard time getting early stage money. We were looking for £300-500K to start, to cover three salaries, rent for a small office, a bit of equipment and some transport costs. We had no luck for a full year, [despite] there was be no shortage of [potential investors] to talk to. We maxed out our credit cards and I freelanced for a few months while my co-founder was running the company.
(Brian)

Brian singled out growth-stage venture capital as very difficult to obtain, and considered the problem to be especially acute in software-related industries. His remarks also exemplify the frustration felt by a number of London entrepreneurs created by the sense that financing was available, just not to innovative startups, which are harder to evaluate for traditional investors:

It is possible to get significant equity financing for traditional businesses that are perceived to be low risk. For innovative startups, the availability of venture capital is very tight. Angel money is a little bit more [available], but there is still a disproportionately small amount, compared to some other ecosystems.
(Brian)

Interestingly, such comments about investor preference for less risky sectors, in which companies do not only possess intellectual property but also tangible assets such as real estate, were very similar to remarks made by Kathmandu and London entrepreneurs.

Another interviewee, Simon, had decided to leave London to pursue fundraising goals, and thought his case was not unusual. Seemingly embittered by the experience, he believed the problem was stifling the community as a whole:

Nobody gave us money here. We moved to the US. The reason I'm here, more or less, is to do things like cancel my flat and [phone and internet service] bills. People talk about how London needs exits, but we can't have exits before entries, so to speak. Investors need to wake up to the potential that they have here.
(Simon)

This comment is another that relates to remarks recorded in Kathmandu case, where entrepreneurs complained about the lack of investors who are willing to invest in ideas.

A number of respondents suggested that the lack of financing was a factor of the relatively young age of the London technology startup scene, and that the situation may change if enough startups are able to grow and give back to the community, i.e. if successful entrepreneurs themselves become investors. Karen expressed this common sentiment:

The more exits we have, the more mentors we will have, and probably, more early-stage financing. London is now known for gaming startups, so I hope that will benefit [our gaming startup].

(Karen)

Marcus complained about the lack of accurate information about funding availability in London. His startup moved to London from Berlin, generally regarded as the second-best place to found a tech startup in Europe (Startup Genome, 2012), because he and his co-founders were under the impression that it would be easier to source venture capital for their business. He said:

We moved here from Berlin, because most European VCs are based here. Well, it wasn't a silver bullet; it's not like you open an office in London and VCs are suddenly knocking on your door. In the end, [when it comes to fundraising] I don't think it matters whether you get on some flights and line up some meetings, or you're actually constantly here.

(Marcus)

Finally, a small number of entrepreneurs explained that they were not looking to raise funds, preferring to focus on self-financed product development instead. These respondents did not necessarily choose such an approach due to a perceived, or real,

lack of financing availability, but rather thought the strategy was best suited to their long-term goals.

6.2.5. Perspectives of Women Entrepreneurs

London's networking groups cater to a variety of demographics (see Figure 10 above), so it was no surprise to find that some of them focus on female tech entrepreneurs, including ones working on mobile businesses. Women entrepreneurs in the mobile technology sector have also taken active steps to support one another, recognizing the fact that there are fewer of them than men. Courtney, who moved to London from Manchester after finishing university, said that a women's networking group had been very welcoming:

[I go to] the London [Girl Geek] dinners. There are a few others as well, but this one is probably best known. If you arrive to London and tell people you're somehow in the technology space, you will be quickly invited to a Geek Girl Dinner and then before you know it you'll host one.

(Courtney)

Such gatherings provide opportunities for group discussions and the development of a shared identity. They also facilitate mentoring relationships between more experienced industry professionals and younger colleagues. Another female entrepreneur, Lisa, said that the Girl Geek network led to an investment in her company:

The best part of the female-themed events is that there's a real sense of camaraderie. I met a very senior person at Microsoft at one of these [dinners], and it led eventually to an angel investment by someone she put us in touch with. It's not like you show up and you get money because you're female. [...] It's like any other networking, but there's more of a shared sense of identity, if that makes sense.

(Lisa)

Julie, who was a mother and whose company's main product was a learning app for young children, pointed out that networks can only go so far and that trying to run a business while caring for children was inherently difficult. She suggested that the general lack of affordable office space for entrepreneurs made this challenge even more pronounced for women who could not easily work from home while their children were young. Other than this comment, however, female entrepreneurs felt that they were not in a significantly disadvantageous position compared to their male counterparts; many had a male co-founder, and most of those said the gender diversity was valuable to their business, allowing them to related to a greater number of customers. This was somewhat surprising to hear, especially in light of popular reports of widespread sexism in other entrepreneurship ecosystems (see, for instance, Streitfeld, 2012; Greenfield, 2012; and Guynn, 2013).

6.2.6. Tech Hubs as Intermediaries

As in Nairobi, tech hubs were mentioned in the context of mediating in-person interactions, and also as sources of affordable space and Internet access. The following quote by Miles illustrates the multitude of uses for a tech hub, as well as the importance of the support of peers who could understand the entrepreneurial path:

My company benefited tremendously from being at TechHub, where we rented office space. First of all, it's cheap and convenient. Second, interesting people would come through all the time and you could meet the big wigs from Silicon Valley, or Israel, or Berlin, or London for that matter. Because it was essentially the sole game in town in 2011, everyone flocked to it. And, third, the community. *It meant a lot to be surrounded by people who understood what we were going through* and some of them would sometimes be able to help, whether with code workarounds, or other problems. [...] The one thing that it was missing was investment opportunities and also links with big companies where we could eventually exit.

(Miles, emphasis added)

In contrast to the entrepreneurs from Nairobi, who shared overwhelmingly positive sentiments about the role of tech hubs in their ecosystem, a number of London respondents related experiences that were not positive, including some related to overcrowding, mentioned above. Courtney expressed pronounced disappointment with a London incubator:

We were in a so-called incubator, to remain unnamed, and were promised seed financing after six months, if we met sales targets. Needless to say, [the financing] didn't happen. We were also promised mentorship, which amounted to one individual speaking with us three times over the six months. He was very helpful, actually, but we were hoping for more.

(Courtney)

On the whole, London respondents mentioned tech hubs and meetup groups less frequently than those in Nairobi and Kathmandu, perhaps considering them as a given part of an entrepreneurship ecosystem, or, alternatively, indicating their relative lack of importance in a more developed economy.

6.2.7. High-speed Internet and Office Space

London entrepreneurs reported that, although broadband Internet and office space were available at only very high cost, they paid for these services directly and did not rely on their networks to obtain these resources. In that sense, they were different than Nairobi and Kathmandu entrepreneurs who described accessing high-speed Internet through hubs or shared their families', friends' and peers' connections. This is to be expected given the differences in GNI per capita and general accessibility to the Internet across the three locations. However, a number of comments related to the cost of Internet access and office space in London as barriers to entrepreneurship remain relevant, despite the lack of related mentions of social ties. They are discussed in section 6.4.2.

below.

6.3. Risks of Networking: Loss of Opportunity Elsewhere

The risks of networking in London were found to fall into very similar categories to those in Nairobi and Kathmandu, with idea theft and loss of time as the most prominent; however, there were some striking differences. For instance, a third of entrepreneurs interviewed in London identified risks of networking in terms of foregoing opportunities in other ecosystems. In other words, risks of participation in London's networks were perceived in terms of loss of resources caused by opting out of participation in networks other locations, where opportunities could be more freely available or more valuable. An illustrative quote is reported in section 6.2.4. above, based on the comments made by the entrepreneur who moved from London to the US in pursuit of funding. Such comparisons between faraway locations indicate that the entrepreneurs interviewed in London felt to be relatively free to switch locations if they so chose, indicating a very enviable position from the point of view of entrepreneurs in Kathmandu and Nairobi. Even with free movement of labour legislation throughout the EU, such a perspective is likely to be confined to a small minority of global entrepreneurs. Alternatively, the respondents felt so well informed about other locations that they analyzed their own circumstances in a comparative way. Silicon Valley and Berlin were mentioned as ecosystems where networking was more valuable than in London, at least by some respondents. Lisa, an entrepreneur originally from the United States said the following:

In Silicon Valley, you don't need to go to networking events – you can just go to

the coffee shop, or the bus stop, or the pub, and you are as likely to meet your next supplier, board member, employee. You could go to the biggest conferences in London and your chances would still be smaller.

(Lisa)

More specifically, respondents named the risk of loss of financing due to a relative lack of access to investors at networking events. A small number of London founders underlined the risk of wasting time by participating in networks. Laura reported the following:

It's actually dangerous, you can spend a lot of time meeting people and networking. Everyone tells you, you have to network. It's who (sic.) you know [...] But there are literally dozens of good, relevant events in London every week for startups. Launches, parties, breakfasts, hackathons, fundraisers, lectures, debates, recruiting events, information evenings [...], it's round the clock. It would be easy to get carried away if you like that sort of thing.

(Laura)

The same respondent suggested that London's networking events were not focused enough for the specific needs of startups, such as meeting potential co-founders, but instead consisted of corporate presentations followed by unstructured networking that frequently turned out to be unproductive for busy startup teams.

6.4. London Ecosystem Characteristics and Barriers

Outside of the networking context, London respondents provided a rich set of data about the local technology ecosystem. They can be grouped into the following categories comparisons to other ecosystems, costs of office space and internet access, and the role of government.

6.4.1. Comparisons to Silicon Valley and Other Startup Ecosystems

Overwhelmingly, London entrepreneurs seemed to be continuously comparing London to other globally-connected cities and those famous for their startup ecosystems. While the occasional comparison would not have been surprising, given that London is ranked among the top locations for technology startups, the volume and frequency of such comparisons were remarkable. Nearly all respondents made at least one reference to Silicon Valley as an example or comparator for London's startup ecosystem, and many talked at length about the similarities and differences of each and the ramifications of operating in one location instead of the other. In general, the context for such comments was an aspiration to improve London as an environment for technology startups.

A number of respondents explained that London is attractive because the major players from other famous startup communities, such as Silicon Valley, make an effort to be present in London. Miles said that many of the local entrepreneurs felt inspired by the success of companies such as Google and Mozilla:

The events put on by the big Silicon Valley organizers are popular. Mozilla has a cult following here with the web enthusiasts. Google, obviously, has a huge draw.

(Miles)

Most respondents referred to a culture of celebration of entrepreneurship as a positive influence on the motivation of startup founders and described that the London ecosystem was changing for the better in that respect. James pointed to Google's multi-use building, which had recently opened, as an example of this:

The success of [Google's London incubator] Campus is the embodiment of people's obsession with Silicon Valley. You walk into Campus, and you're immediately inspired. It's a kind of glamour you couldn't have if it didn't have the Google brand. Argos Campus just wouldn't do it, would it? [laughing].

(James)

Many entrepreneurs commented in some way on the culture, mindset and attitudes of entrepreneurs and investors in London, comparing them unfavourably to the Bay Area environment, and expressing hope that this might one day change. According to Simon,

The mindset here isn't where it should be. The City contributes to a culture that is very corporate, very lavish, even during the crisis. Good talent flees to other places, or never shows up in the first place, because they don't feel at home here. The other reason startups leave is that they are as likely to be picked up by US investors as they are by British ones. And so many are lured away to the US.

(Simon)

Another recurrent, oft-cited downside of local culture was the perceived humbleness of London entrepreneurs in comparison to US founders, who were seen as more outspoken and capable of using media for promoting their startups. Karen said it was difficult for local startups to get the attention of the public and said American startups were much more assertive in communicating with the media:

In my view, we are too timid and too quiet. It's difficult to compete [...]. American startups come over and they flood the media—traditional and new, social media channels—with marketing messages. It has been very hard for us to get heard. We have so many amazing products originating here but nobody knows about them. I was in New York last week. Nobody I spoke to could name any of the London [startup] stars. Nobody had heard of any even when I specifically asked about Moo, or Last.fm or whatever.

(Karen)

Lisa elaborated on one of the mechanisms through which low motivation translates into a negative impact on a startup. Namely, she said that a lack of encouragement from the community results in fewer people considering entrepreneurship as a career, and, as a result, fewer entrepreneurs succeeding, due to a lack of experience.

The talent issue is connected to a mentality issue. In Britain, entrepreneurship is

stifled because failure is stigmatized to an extent. The recipe is go to the best unis [and] get a stable, traditional job. In America, failure is celebrated. If you don't have a failure or two behind you, investors are skeptical.

(Lisa)

James suggested that the negative feedback from, or negative “attitude” perceived in one's network could be stifling:

It's a myth that the Americans are bigger and better. They just have a better attitude: you are free to praise yourself or others; but if you are going to criticize something, you better be able to back it up. Here, people are more likely to tell you how it's never going to work. So, out of the gate, you're being cautious, you don't want to be too visible, you don't want to say “I'm going to be the best whatever company” because people will immediately tell you how ridiculous you sound.

(James)

Comments recorded in the context of such comparisons can seem contradictory, especially when they are related to the path startups take as they enter global markets. For instance, one interviewee remarked “to truly grow into a global company, you have to have a presence in Silicon Valley,” while another noted that “Silicon Valley startups who want to go international come to London. We don't have to go anywhere to get that international angle. The world comes here.” The two statements, however, are not necessarily incompatible. As can be surmised from earlier quotes in this chapter, the focus of the first is on the expansion of a company, and in particular the availability of financing for global growth, while the second statement describes the diversity of perspectives available in London.

Laura expressed the view that the negative comparisons to Silicon Valley were unhelpful, because they distracted startup founders and employees from the focus on building successful technology businesses in London. According to her, the tendency to describe London in unfavourable terms also contributed to the propagation of the

stereotype of London as a difficult place for startups.

I don't know why we have to compare ourselves with Silicon Valley all the time. Why can't we just be good Old Street Roundabout, instead of "Silicon Roundabout?" That terminology sets a direction and what if we want to go in a different direction? There is a lively debate around this issue among the startup founders.

(Laura)

Miles seemed to hold the opposite view and implied that London should be compared to the best-known environments for startups, such as Silicon Valley, implying that aspiring to achieve similar levels of success was the overall goal. He said that making comparisons to smaller ecosystems, such as Berlin, was not relevant for the future of London as a hub for mobile technology startups:

We are not comparing ourselves to the right benchmarks. The Economist published an article saying that London gets four times as much VC money as does Berlin. So what? That is not significant.

(Miles)

A small number of founders suggested that the differences and the specific characteristics of London's ecosystem could be a source of competitive advantage. For instance, James felt that London's startup scene should take advantage of the financial industry's presence:

In Silicon Valley, the technology industry is a strong influence. In London, the financial industry is a strong influence. In the long run, it's not clear which is better.

(James)

James offered a conclusion that seemed to imply that entrepreneurs were telling stories about Silicon Valley and other places in order to make themselves feel better, providing further evidence of the conscious consideration by entrepreneurs of the impact of such comparisons on the ecosystem itself.

Here in London, there's a bit of an obsession with Silicon Valley, like it must be the startup paradise – you show up with your idea and the next day you've exited to Google. That's simply not true. The mythical status of Silicon Valley is almost like an excuse for us here. [We say] "I couldn't raise money; it's because London is not Silicon Valley," or "I couldn't find a developer; it's because London is not Silicon Valley." The founders that focus on what they can do in London are going to do better than those who mope about not being in Silicon Valley.

(James)

Although some statements that compare London to Silicon Valley may suggest otherwise, the two ecosystems are well connected. Brian said:

We hear about recruiters from Silicon Valley coming here and some people have had offers to move to San Francisco to work for American startups.

(Brian)

Testament to this fact is also the existence of an industry event, entitled Silicon Valley Comes to the UK, which is meant to bring the top successful US entrepreneurs to meet budding British talent. The program, which started in 2000 under the brand Silicon Valley Comes to Oxford, expanded to cover London in 2011. Many interview respondents also indicated that they had visited Silicon Valley, were connected to entrepreneurs, partners or investors there, or had hired employees from the area. Andre said the following:

My co-founder used to run a London office for an American startup. Eventually, the startup was sold and I was able to persuade him to join as our CTO.

(Andre)

According to Brian, London's global nature allows for founding teams to combine founders with local knowledge and connections with founders who have gained international experience in other places.

There are two types of founders. One type [...] people who are living in London anyway and want to start a company. They decide they want to build a mobile app because it's cool, and the costs are low. They already know people [in

London] and have support from friends and family. I am in this group. The other type are people coming [to] London who feel stifled in Brighton or Manchester or Hamburg or Poland, as well as in Silicon Valley or Israel or Finland. They see London as expensive, but also [...] full of opportunity. [...] There are fewer of them but they are very creative, visionary people who are better at risk taking. They have a really big idea. And the two groups actually complement each other.

(Brian)

What is evident from these accounts is that entrepreneurs spend considerable time thinking, theorizing, and speaking about their own environments and networks and the impact on their ability to be successful.

6.4.2. High Costs of Office Space and Internet Access

It was not only women entrepreneurs who found the high costs of operating a startup to be a challenge in London. Brian made a direct link between the lack of affordable office space and his company's inability to increase market share:

We needed flexible, cheap office space. We found long term, run-down, expensive office space far from where we want to be. It's a huge drain on our ability to go after new customers.

(Brian)

In addition to office space, a number of respondents mentioned high-speed broadband to be prohibitively expensive. The fact that respondents in London singled out high-speed broadband Internet as a distinct resource was at first puzzling, given London's status as one of the richest cities in the world, and the widespread availability of internet connections there. The context in which internet connectivity was mentioned is the high overall cost of operating a company in London. In particular, the inflexible nature of broadband contracts adds to the cost of the already high connectivity fees. Lukasz shared his concerns about having assumed personal costs of Internet connectivity

because there were no alternatives:

Fibre broadband is not available everywhere. Plus, if it is, they want you to sign a year-long contract just to get you connected. We need a lot of bandwidth and can pay for it right now, but I had to assume personal responsibility for this really, really expensive contract with BT. If [the startup] goes under, I am stuck with the contract.

(Lukasz)

Office space and broadband are just some of the items that make London an expensive place to found a company. Marcus, who had moved to London from Berlin, commented in particular on the high cost of housing and transport.

Forget office space, just renting a place to live is impossible if you're a startup, unless you're sharing with seven other people or living at the end of the Northern Line. [...] Then, you can spend twenty quid per day just on [public transport]. There are many other places that would be better [in terms of cost] than London.

(Marcus)

Despite recognizing the high costs of operating a business, Marcus remained positive about London as an overall environment for startups, and said he did not regret moving there. His opinion was not unique, as the demand for facilities and services catering to startups shows. At least two respondents said that facilities catering to startups and small companies are often oversubscribed, due to the high demand for affordable offices. Lisa shared her experience with crowding:

We work out of the Ugli Building in [the suburb] White City, and it is full to the brim. There is no more space.

(Lisa)

Brian said that prohibitively high office rents were hampering his startup's growth:

We were renting office space in TechHub [an incubator] for a while, but now

[that we want to expand our operations] we need more space and we haven't been able to find something affordable.

(Brian)

One of the early attractions that initially drew technology and media companies to East London was affordable space. Many shared offices were still available there and in other parts of the city at the time of data collection; however, as the testimonies above indicate, once a startup was ready to expand, finding independent space with room to grow proved to be very costly.

6.4.3. Role of Government

According to the CEO of the British technology company Dyson, 61,000 engineering jobs were at risk of being unfilled in the UK in 2014 due to the lack of appropriate visa arrangements for highly skilled workers (Dyson, 2014). Visa issues were also mentioned in a number of interviews for this study. James, who relied on university students for much of the early work on his company's product, an email app, described the immediate impact on his business:

Our beta product was basically built by three foreign students, one Indian and two American, but they couldn't stay on [for] two reasons: they didn't have visas and they were offered higher pay in America. [...] So we had to delay launch.

(James)

James also said that the government seemed to be considering the problem, but that details were not available:

We have heard from [the government] that the entrepreneur visa scheme may become more easily obtainable for software engineers, but we haven't heard concrete news.

(James)

Karen reported that the government's focus was on investors, and not the highly-skilled talent needed to allow mobile technology startups to grow.

The entrepreneurship visa requires you to invest GBP 200,000. We need a different type of "startup talent visa" to be able to also import talent.

(Karen)

Karen also suggested that schemes in other countries, such as Ireland, should be considered for Britain, along with efforts to make startups more welcome by traditional industries. Other than visa issues, government involvement was mentioned mostly in a positive light. In Lisa's words:

The government programs have helped us. We were chosen as one of the Future Fifty companies and that helped us a lot to get to the next level. People hear about it, and it's great publicity to be mentioned in the same breath as the superstars of the London scene, like, let me see... [looks up the list of winners] Shazam, Graze, HailO, Box, SwiftKey, SkyScanner, Moo.

(Lisa)

In addition to the Future Fifty program, which provides support with growth strategies to the best 50 startups each year, the government worked with the London Stock Exchange to make it easier for high-growth firms to be admitted to the exchange. Under the rules approved in February 2013, companies with compounded annual growth rates in revenue of at least 20 per cent can list with a minimum free float of only 10 per cent, compared to the previous requirement of 25 per cent (London Stock Exchange, 2013).⁷

Perhaps the best known government intervention in the tech startup ecosystem is the Seed Enterprise Investment Scheme (SEIS), launched in April 2012 to encourage investors to finance startups by providing them with significant income tax and capital

⁷ Note that investors in companies with a smaller free float (portion of shares that are publically tradable) are at risk because it will mean they can exercise little control over the company.

gains tax breaks. Investors receive a reduction in income tax liability at 50% of the cost of the shares, up to £100,000 in total investment (i.e. if their income is £200,000, and they make a £100,000 investment in a startup, their taxable income drops to £150,000). In addition, capital gains tax is waived on profits of shares held for over three years. Finally, in the case of bankruptcy of the startup, investors can claim loss relief equal to half of their total investment multiplied by their tax rate (HM Revenue & Customs, 2013). This effectively translates to total tax breaks of up to 78% (78% Tax Relief Lures Startup Investors, 2012). In 2013, the prime minister office held additional meetings with investors interested in “growth finance” to consider whether similar tax deductions could be offered to individuals who invest in venture funds, in addition to savings the SEIS scheme offers for investments in individual companies (Start Me Up, 2013). Many of the London respondents spoke about government efforts to support entrepreneurship in positive terms, but felt that the government’s power was limited in ensuring successful growth of the ecosystem. Brian’s comments summarize a number of sentiments expressed about the need for a “senior class” of successful entrepreneurs who could reinvest their profits into newer companies:

The government is trying to help, but what we really need is enough big exits so that the ecosystem can start to renew itself. [...] Successful entrepreneurs, when they sell a company, are the first to look for other opportunities. We have some good music, design and gaming examples, that could really help put London on the map for those particular types of [tech] startups, but we are still waiting for the senior class to hit it big and start reinvesting in the newcomers.

(Brian)

This vision of an entrepreneurship ecosystem that renews itself, whereby successful entrepreneurs reinvest profits into newer companies, is shared among entrepreneurs from all three cities considered. This shared vision also seems to be influenced by the

experience of Silicon Valley.

6.5. Emerging Themes

Despite the great differences in London's overall socioeconomic environment, there are three striking similarities in the findings from this case with those from Nairobi and Kathmandu. The first is the importance of community and in particular the role of the community in achieving efficacy, legitimacy and personal support (from logistical help such as getting access to a shared building in the middle of the night, to the sharing of stories and advice and creating a sense of camaraderie). In London, as in the two other cities half-way across the world in Africa and Asia, respondents spoke of entrepreneurship as a collective endeavor, dependent on their immediate environment, or ecosystem. Precisely because of this dependence, they seemed to build and rely on community networks to negotiate their ability to obtain resources from the wider society, both locally and internationally. One notable difference related to the "community" theme was the sheer number of groups (some of which are listed in Figure 10 above), and the variety of specialized networks, either for particular programming languages or for particular demographics (e.g. women). The fact that multiple local networks exist in London was a sign of high participation of the entrepreneurs in networking activities, and, coupled with the implicit assumption by respondents that networking is unavoidable for successful entrepreneurs, strengthened the prominence of this theme. With increased choices for networking activities came increased risks (compared to Kathmandu and Nairobi), especially in terms of wasting time on unproductive events. In other words, while networking was a given for London

entrepreneurs, they did not participate in specific events indiscriminately; instead, most were careful to weigh the benefits with the risk of wasting time, and sought to choose only those events they found valuable in some way.

The second shared theme concerns the availability of skilled labour. Like their Kenyan and Nepalese counterparts, London entrepreneurs faced the same challenge of talent shortage; however, in the case of London, the reason behind the shortage was not seen to be an absolute lack of skilled labour, but rather the crowding out of innovative, small firms in search of talent by the established banking industry, whose major companies could offer much more lucrative opportunities, especially to software developers on whom the mobile app businesses depend. There was some disagreement among London respondents regarding the degree of this shortage: while some recognized that the proximity of world class universities provided a significant advantage to London entrepreneurs over many others, a number pointed out that the universities were not well integrated into the entrepreneurship ecosystem, which meant that convincing graduates to take a risky job in a startup was more difficult than in a place such as Silicon Valley, where Stanford University in particular played an important role in talent management for startups.

This brings us to the third similarity among the cases: the explicit references to, and the implicit molding of the ecosystem after California's San Francisco Bay Area, i.e. Silicon Valley. London respondents exhibited awareness of their relative advantages compared to alternative European and global locations; however, many described their networks and environment in comparative terms with Silicon Valley as the clear frame of reference. From comments about the pervasiveness of entrepreneurial

networks, to observations of an overall higher risk tolerance, to statements indicating belief that startup financing was more plentiful in Silicon Valley, London entrepreneurs made it evident that they were constantly comparing themselves to the world's most famous entrepreneurship ecosystem. Most notably, respondents felt that investors, especially venture capital firms, were likely to overlook opportunities in London in favour of those in Silicon Valley, and that this behaviour--whether due to inertia or conscious preference--made the advancement of the London ecosystem more difficult. Not all of the commenters concluded that Silicon Valley entrepreneurs had a clear advantage over those in London and one expressed uncertainty about whether following the Silicon Valley model was necessarily beneficial to London. The fourth theme relates to a unique advantage seen by London respondents about their networks: the ability to pursue global market opportunities from the earliest stages of growth, by obtaining globally-relevant resources (such as Mandarin-speaking employees, or Indian market research experts). This ability to have a global perspective was influenced by many factors, including London's relatively favourable geographic location that made working across many time zones possible, the international nature of the city's population, its position as a leading global financial centre, and excellent Internet as well as transport connectivity. As a result, London's entrepreneurial networks span multiple cities and continents and are not confined to the local environment in the sense that the Kathmandu community, for instance, seems to be. This means that the network resource base available to London entrepreneurs is not only richer due to the local diversity and international linkages but extends to individuals and groups around the world -- an important advantage for entrepreneurs seeking to enter global markets with

their products and services. Finally, the fifth theme relates to institutional support of the entrepreneurial ecosystem, which is also the area that sets London far apart from Kathmandu and Nairobi. London entrepreneurs benefit from strong government support, which includes funding and mentoring schemes, tax-incentives for investors into early-stage companies, and arrangements to make it easier for entrepreneurs to list their company on one of London's stock exchanges. In addition, they are surrounded by the best universities around the world, which supply not only skilled graduates but also mentors and advisors for entrepreneurs. On a more basic level, the city infrastructure on which entrepreneurs rely, from public transit, to widespread availability to broadband Internet, to multiple technology hubs and co-working spaces, is far more advanced in London than in Kathmandu and Nairobi. While London's sophisticated urban environment does come at significant costs (including, in particular, the high costs of office space and broadband Internet), it is difficult to deny that it helps technology entrepreneurs in their day-to-day work.

6.6. Chapter Summary

As a much larger, much richer, and much better connected city, in terms of trade and communications networks, London provides a very different environment for technology startups, when compared to Kathmandu or Nairobi. Surprisingly, there are a number of close similarities between the experiences of entrepreneurs interviewed in London and those in the other two cities. For instance, despite being ranked as the second-best entrepreneurship ecosystem in the world by Startup Genome (2012), London entrepreneurs, like their Kathmandu and Nairobi counterparts, reported a

constrained supply of skilled labour, along with high costs of office space and broadband connectivity as some of the most pronounced barriers to their success. In addition, despite widespread institutions dedicated to supporting entrepreneurs, from technology hubs, to dozens of networking organizations, to government policy schemes that encourage investment in startups at all stages of a startup's growth, entrepreneurs perceived the London ecosystem to suffer from insufficient support from investors, whom they describe as too risk averse this is another finding that parallels results from the preceding two cases. The most significant advantage of starting a technology company in London was seen to be related to the global nature of the city, including the presence of potential founders and employees of many nationalities; in particular, entrepreneurs said they benefited from the ability to incorporate knowledge about markets around the world into their strategies, and to rely on strong personal connections of their team members to those markets.

The findings presented in this chapter show that London entrepreneurs, like their colleagues in Kathmandu and Nairobi, frequently reference other ecosystems; some of them explicitly spoke about their environment as lacking in comparison to Silicon Valley, while others said that London provided better support for technology entrepreneurs than other locations in Europe, such as Berlin. Thus, we can conclude that respondents in all three cities were not only aware of other entrepreneurship ecosystems around the world, but knew enough about their characteristics to be able to evaluate them in some way, and that they sought to describe their own environment in comparative terms; across the three cases, Silicon Valley was mentioned most often as a comparator, a finding the following chapters will analyze in detail.

7. Discussion of Results

The cities of Kathmandu, Nairobi, and London could hardly be located further from each other, and from the world's de facto entrepreneurship capital: Silicon Valley in California's San Francisco Bay Area. Yet the findings of the three city-based case studies point to increasing convergence in the structure and function of their entrepreneurial networks, as this chapter will demonstrate. Without considering the details, one might speculate that the reason for this convergence is a combination of increasing economic interdependence of cities and countries around the world and the meshing of cultural elements caused by globalization; however, examining even the broad differences between the three cities makes it clear that such an explanation would be overly simplistic at best, and probably outright inaccurate. Indeed, despite increased connectivity around the world (Castells, 2011), the three cities remain very different in their levels of economic development, relationships to other global centers, trade statistics, technological infrastructure, and the environments they provide for startups, as chapters 4 through 6 have shown. London, as one of the world's top financial centres and the capital of one of the richest countries in the world, stands out among the three in socioeconomic terms. Kathmandu and Nairobi are much poorer in terms of per capita income (World Bank, 2011), much less connected to the world as measured by traditional trade statistics such as levels of imports and exports (World Trade Organization, 2012b), and much less entrepreneurial or innovative as measured by venture capital flows and rates of new business registrations (Dutta, 2011).



Figure 11: London, Kathmandu, Nairobi and Silicon Valley on a World Map (Google, NASA, TerraMetrics, 2014)

Nepal and Kenya, of which Kathmandu and Nairobi are capital cities, also share some similarities. Both countries have experienced violent conflict in recent history (Macours, 2011; Anderson & Lochery, 2008), have similar levels of income inequality (World Bank, 2012h), and have comparable ICT indicators (International Telecommunications Union, 2011). Nepal and Kenya also differ from each other in significant ways. Nepal is a landlocked country, nestled between India and China. Following centuries of monarchical rule, Nepal is now governed by a communist regime that follows a local version of Maoism (Sharma, 2004, Byrne & Klem, 2014). This interpretation of Maoism, known as Prachanda Path (Sharma, 2004), relies on violent struggle, although the most recent speeches made by government officials indicate a possible departure from violent revolution as a necessary component of governance (Acharya, 2013)⁸. Despite small steps towards stability, Nepal remains one of the poorest countries in Asia, second only to Afghanistan (World Bank, 2011). In

⁸ Prachanda is the nom de guerre of former revolutionary leader Pushpa Kamal Dahal, and means “the fierce one.” See Bell, 2006.

economic terms, it depends largely on India, which provides most of its foreign investment (Chrysostome & Molz, 2014). Kenya recently passed the threshold necessary for an economy to be classified as middle-income (Copley, 2014), due to the government's update ("rebasings") of its national accounts (Kenya National Bureau of Statistics, 2014); however, at the time of data collection, this middle-income classification was not widely recognized and its per-capita income remained only slightly higher than Nepal's (World Bank, 2011a). Unlike Nepal, which is landlocked between Nepal and China, Kenya has been the main travel hub in East Africa since 1946 (Hornsby, 2012). It has a free market economy and is a major shipping and trading destination (Alila et al., 2005), which benefits from its exports of tea, cut flowers, coffee, legumes, and passenger and cargo ships (MIT, 2013). Its nascent digital industry has attracted the attention of many large global corporations, as well as researchers from industry bodies such as the GSM Association (GSMA, 2014).

Given the variety of historic, geographic, and economic characteristics, it is to be expected that the experiences of entrepreneurs in the three cities also vary widely. Surprisingly, the comparison of characteristics and themes emerging from each of the city-based cases uncovers a set of close similarities and consistent trends in all three. In particular, as this chapter will show, all three cities have given rise to entrepreneurial networks and practices modeled after Silicon Valley, despite the vast differences between them. The results point to the process of institutional isomorphism, described by DiMaggio and Powell (1983) and discussed in more detail the following chapter, but on a global scale and with entire entrepreneurship ecosystems behaving as institutions and mimicking what is perceived as a successful prototype, in order to establish their

own legitimacy, among other reasons. The remainder of this chapter will provide evidence of this process, and discuss whether such mimesis reduces opportunities for local innovation in the mobile technology industry.

7.1. Comparison of Themes from the Cases of Kathmandu, Nairobi and London

Before comparing the themes emerging from the previous chapters, it is useful to reconsider the study's initial research questions:

- 1) What motivates entrepreneurs to participate in social networking activities? In particular, what kinds of value or benefits do entrepreneurs consciously pursue through informal networks? Further, what kinds of risks do entrepreneurs consciously assume by participating in informal networks?
- 2) What is the role of interpersonal networking activities in “innovation ecosystems” and does it vary depending on the level of development of the “ecosystem” or from country to country? Further, do informal networks give impetus to some types of formal, institutionalized exchanges, including, but not limited to, partnerships or industry associations?

Following the data collection and analysis presented in the preceding chapters, it became apparent that the first set of questions largely confirmed motivations related to non-subjective resources already described in literature, while the second set of questions yielded richer and/or more theoretically consequential findings. In the results stemming from the first set of questions, one of the most interesting findings is related to the role of networks in providing community support to individual entrepreneurs. This relationship emerged as one of the strongest and most consistent themes across the cases. The community support was reported to play an important role in the acquisition

of two types of subjective resources, self-efficacy, and legitimacy. Questions from the second group resulted in the most striking findings, related specifically to the tendencies towards institutionalization of previously informal efforts to strengthen the entrepreneurial ecosystem, found to have occurred in all three cases. Particularly surprising were the similarities in structures of and the near-identical nomenclature used for these fledgling institutions, despite the vast contextual differences and geographic distances between the three locales. Interestingly, many of the results stemming from the first set of questions are best understood in the context of the two findings just noted: the role of networks in providing community support and in institutionalization of entrepreneurial ecosystems. Thus, for instance, discussions related to motivations for and deterrents from participation in networks, along with constraints faced by entrepreneurs unrelated to their networks, revealed rich details on the gradual evolution of each ecosystem toward an ideal that is clearly inspired by Silicon Valley. Table 5 below summarizes these findings in four groupings: role of networks in community support; emerging institutions; motivations for, benefits and risks of networking; and constraints to ecosystem growth.

	Kathmandu	Nairobi	London
Role of networks in community support	Networks are few in number but important for acquisition of resources; sense of community especially important for acquisition of self-efficacy and legitimacy (subjective resources).	Networks important for acquisition of resources; community helps with further legitimizing entrepreneurial activity and with acquiring skills related to self-efficacy.	Participation in networking is a given; multiple (40+) local communities exist to serve specialized interests and resource needs. Networks are highly specialized and provide resources related to local as well as international markets.
Emerging institutions	Community attempts to perform institutional functions, in the absence of dedicated institutions. Inspiration/modeling after Silicon Valley.	Formalization of networking has led to formation of tech hubs and regular groups that fill the gaps in support created by lack of dedicated institutions. Inspiration/modeling after Silicon Valley.	Strong institutions that support the ecosystem exist and benefit from government initiatives. Frequent comparisons with and references to Silicon Valley.
Motivations, benefits and risks of participation in networks	Self-efficacy, legitimacy and personal support. Strong collaborative sense within the network despite some perceived risks of idea theft and loss of time.	Self-efficacy and personal support; legitimacy also prominent, but slightly less so than in Kathmandu. Greater perception of risks than in Kathmandu; in response, entrepreneurs share ideas with network only when the benefit of sharing is immediately apparent.	Self-efficacy and personal support; need to establish legitimacy through networks is not as strong as in Kathmandu and Nairobi—indication that entrepreneurship is already seen as a legitimate choice; evidence for this can be seen in the established institutions for entrepreneurship support. Strong awareness of risk of loss of time if networking events turn out to be irrelevant.
Constraints to ecosystem growth	Lack of local mentors, lack of infrastructure (e.g. policy) to allow for monetization of apps, labour shortage, unreliable Internet access, difficulty working with network operators.	Labour shortage, difficulty with monetizing apps despite widespread use of mobile banking, unreliable Internet access, difficulty working with network operators.	Labour shortage (due to competition from banking industry), perceived lack of attention by investors, lack of established entrepreneurs to reinvest into the ecosystem.

Table 5: Summary of Findings

7.1.1. Comparison of the Roles of Networking and Community for Non-Subjective and Subjective Resources

Results from all three locations confirm the well-established notion that entrepreneurs use networks to acquire resources (Aldrich & Zimmer, 1986; Jenssen, 2001; Elfring & Hulsink, 2003; Greve & Salaff, 2003) and also point to a distinction between how subjective and non-subjective resources are obtained via networks (Arenius & Minniti, 2005; Hall, 1992). This study confirms that networks are integral to the process of finding measurable inputs into a new business such as financing, labour, broadband access, office space, and specific technical and business-related knowledge and information. While these non-subjective resources were found via networks in each of the three cases examined, there were some differences in the perceived importance of a supportive community of personal contacts for the process, as well as in the type of resources sought via such networks.

The conscious reliance on networks for non-subjective resources was most pronounced among Kathmandu respondents, a number of which mentioned that information or knowledge obtained via existing and new network contacts was not accessible to them in any other way. Kathmandu respondents were also most likely to talk about the role of the “community,” a supportive subset of their personal networks that shared their experiences and goals. In Nairobi, information resources and labour were among the non-subjective resources sought and obtained through networks. The concept of community was also prominent, although Nairobi respondents did not use the term as frequently as Kathmandu interviewees did. In London, entrepreneurs reported focusing on seeking to overcome labour and financing shortages via their networks, and described

these resources as the main bottlenecks in achieving success. In comparison to Kathmandu and Nairobi respondents, London entrepreneurs also relied more on formalized sources, such as Internet boards, online services and recruiting events, which were more easily accessible and more prevalent in London than in Nairobi and Kathmandu; once prompted, however, they also said the community support was present and very important.

In each case, it was clear that the pursuit of non-subjective resources was not the only motivation for networking. In fact, in the cases of Kathmandu and Nairobi, the subjective feeling of belonging to a community of like-minded individuals who could lend peer support to nascent entrepreneurs was found to be the strongest incentive for participating in networking activities. A similar sentiment was clearly expressed by respondents in London too, albeit less frequently than in the other two cities. It is worth recalling that Saxenian's discussion of Silicon Valley also emphasized the sense of community, based on a shared commitment to advancing technology, which, according to her, gave the region an edge over other innovating locales within the US (Saxenian, 1994). The support from and validation by the community—whether informal, and exhibited in everyday acts of assistance or support, or explicitly obtained, for instance, by winning competitions—were especially important for acquisition of subjective resources such as self-efficacy and legitimacy, both in Kathmandu and in Nairobi.

In Kathmandu, the networks were seen to be a main source of both subjective and non-subjective resources, which is not surprising given that very few established initiatives (let alone institutions) focused on entrepreneurship support existed at the time of data collection. In other words, for Kathmandu entrepreneurs, the networks were almost all there was. While the Nairobi networks had succeeded—to some degree—in institutionalizing their efforts through organizations such as the iHub and others (e.g.

Nailab, @iLabAfrica, etc.), the community networks continued to help with further legitimizing entrepreneurial activity in society at large, and with acquiring skills that led to improving self-efficacy. In London, participation in networking events was considered to be a given and this sentiment was supported by the fact that more than 40 networking communities exist to serve specialized interests and resource needs of mobile app entrepreneurs and developers (leaving aside any other communities for software entrepreneurs). Indeed, two of the defining features of London's networks were their diversity and ability to provide specific resources related to local as well as international markets, including language skills and personal connections to actors in faraway, yet markets with high potential for growth in mobile apps adoption, such as Nigeria or Indonesia. Given a certain similarity found across the three cases in terms of tendencies towards institutionalization, motivations, sentiments, desires for self-efficacy and terminology, the London case may be viewed as furthest along on a scale from a rudimentary ecosystem to the Silicon Valley model.

7.1.2. Comparison of Levels and Types of Institutionalization of the Three Entrepreneurship Ecosystems

The most interesting comparisons to be made across the three cases are those of the levels of institutionalization within the three entrepreneurship ecosystems and the types of emerging institutions. In Kathmandu, for instance, in the absence of dedicated institutions, community networks perform some functions that would otherwise be provided by a variety of public or private organizations; for instance, whereas Stanford University operates its own venture capital fund, StartX, in California, Kathmandu's Mobile Nepal network attempts to encourage interaction between researchers, investors and entrepreneurs in a more informal way, through conferences and casual meetups. In

Nairobi, in an effort to formalize the entrepreneurship ecosystem, the community has established a number of tech hubs and regular events such as competitions, lecture series or workshops. These provide permanent spaces or regular opportunities for a variety of ecosystem stakeholders to interact, and, where possible, collaborate. As one example, Nairobi's iHub holds regular pitching events and fundraising evenings aimed at encouraging matching between investors and startups.⁹ Since data collection, the iHub founders and other investors have also started a seed investment fund for high technology startups, the Savannah Fund (see Savannah Fund, 2013). In London, very strong ecosystem-support institutions exist, including co-working spaces, hubs, incubators, acceleration programs and many others, and the entrepreneurship community on the whole benefits from a wide range of government initiatives. Some of the most tangible of those include generous incentives for investors to consider financing risky early-stage companies, and efforts to make the listing process on the London Stock Exchange easier for technology startups.

A related theme common to all three cases was the frequent comparison to other ecosystems. In each case, Silicon Valley references were most prominent, and were made in the context of each stage of an ecosystem's development, although the UK and India were also mentioned in Kathmandu. Such references were especially evident in the format and terminology used for various organizations and institutions. Silicon Valley has been described as a "hub" of technology innovation (see Saxenian, 1994), and spaces where technology entrepreneurs meet are often called "labs" (the first, and most famous of which

⁹ According to the iHub website, "Nairobi Start-Up Pitch Night is a (free) regular event where 5 startups of all stages and industries get to pitch. The event brings together investors, advisors, students, business leaders, successful and aspiring entrepreneurs, and anyone who loves startups. The Startup Nights will be held every 3rd Wednesday of the month." See iHub, 2013.

is Bell Labs, founded in 1925) and “garages” (referencing the HP Garage, sometimes said to be the birthplace of Silicon Valley, and the folklore surrounding the birth of the first Apple computer in the garage of Steve Jobs’ family).¹⁰ In comparison, Nairobi has the iHub, Nailab, mLab, and Mobile Garage. Kathmandu, being at the earliest stage of development when research was conducted, did not have many spaces for tech entrepreneurs; however, in Kathmandu, the word “ventures” was used to describe the first private incubator, Biruwa Ventures, and to refer to the financing scheme, Fortune Cookie Ventures. In the context of startups, the term “venture” has also, arguably, been popularized globally through success stories emerging from Silicon Valley, with Fairchild Semiconductor International and Digital Equipment Corporation as some the startups to receive the earliest venture capital financing in the 1950s (Gompers, 1994). In London, the city’s Old Street neighbourhood has been dubbed Silicon Roundabout (Florida, 2012), leaving no doubt about the US region’s influence on the London’s community. Frequent comparisons with and references to Silicon Valley by London entrepreneurs betrayed a singular focus on catching up to the single ecosystem ranked more highly than their own by Startup Genome (Startup Genome, 2012).

The shared terminology used by entrepreneurs also applied to networking activities. Across the three cases, individual events or series of events carried either brand names, such as StartupWeekend, or common terms such as hackathon, bootcamp, and barcamp. Since data was compiled, a series of events under the name Startup Grind, sponsored by Google, have also been held in Kathmandu.¹¹ The Startup Grind event held on October 19, 2014, included a “fireside chat,” another term first popularized by Franklin

¹⁰ Less frequently, the terms space, factory, campus, and spot are also used. For additional Silicon Valley terminology, see, for instance Fourgeaud, 2012.

¹¹ See for instance, Startup Grind Kathmandu (2014).

D. Roosevelt (Braden & Brandenburg, 1955) and frequently used by the tech startup community in the Bay Area. Other common terms, found in Kathmandu, Nairobi, and London, include challenge (e.g. design challenge, app challenge), tech roundtable, forum, Demo Day and Demo Night. The term “demo,” short for “demonstration,” is particularly prevalent; thus there is SF Demo Night in San Francisco, TechHub Demo Night in London, Demo Africa in Nairobi, and Rec@nnect Demo Day in Kathmandu. Beyond terminology, the physical environment as well as training curricula are also modeled after Silicon Valley blueprints. For instance, in Nairobi, the iHub space, with its open space layout, colourful walls, comfortable couches, a foosball table and a coffee shop on premises, looks as if though it could have been teleported from the offices of Google or one of the other similar technology startups that encourage creativity and interaction through interior design elements. On June 14, 2013, the iHub held one of its many workshops introducing the “Lean Startup” methodology to local entrepreneurs (PivotEast, 2013), another product of the industry surrounding Bay Area startups (see Ries, 2011).

Further, respondents said that they turned to the Internet, and especially Internet forums, to solve their technical problems as well as to learn skills necessary to run a business. It is likely that online forums and other globally-popular entrepreneurship websites have played an important role in the proliferation of the terminology discussed above. Some of the websites mentioned by respondents include Lean Startup Circle, AngelList, Random Hacks of Kindness, StackOverflow.com, DreamInCode.com, CodeProject.com, Bytes.com and forum.xda-developers.com. In other words, the three communities share a common set of references, and engage in similar types of activities, for which they use the same or similar labels. This shared terminology is likely to make it easier for entrepreneurs to acquire technical help, business knowledge, investment and

clients from beyond their immediate geographical location.

7.1.3. Comparison of Motivations for, Benefits of, and Risks of Participation in Networks

As mentioned above, motivations for networking centered on the acquisition of a variety of resources, with subjective resources showing up as especially prominent in the responses of entrepreneurs interviewed. In Nairobi and Kathmandu, these could be grouped into self-efficacy, personal support and legitimacy for entrepreneurship as an economic choice. In London, the need to establish the legitimacy of entrepreneurship through networks was not as strong as in the other two cities. This is likely due to the fact that entrepreneurship is already seen as a legitimate choice, evidenced by the many existing institutions that provide entrepreneurship support, described in Chapter 6. However, self-efficacy and a sense of being supported by a community did emerge as strong motivations in London as well as the other two cities.

On the whole, only a few entrepreneurs reported perceiving risks in networking activities, but that does not mean that these risks were irrelevant. Risks were reported in each case, and a number of concerns was shared across the three cases. The risk of wasting time was perceived by respondents in each group. This risk was thought to materialize whenever an entrepreneur attended networking activities that were not directly relevant to his venture, or whenever he spent time in a tech hub but was distracted from productive tasks by other hub visitors. In London, the possibility of losing time by engaging in unproductive activities was seen to be especially concerning; this is likely a result of the size of the large size and number of entrepreneurship networks, including hundreds of meetup groups and events on offer each week, coupled with comparatively little ability to predict in advance which activities will be useful. There, a number of respondents reported

avoiding events if they did not clearly know the value it would bring to their ventures.

In Kathmandu, there was a strong collaborative sense within the (single, relatively tightknit) network, despite some minor perceived risks of idea theft and loss of time. In Nairobi, the perceived risks were greater than those in Kathmandu, and entrepreneurs reported that they coped with risks through strategies that limit sharing ideas with the network only when the benefit of sharing is obvious. Some of the Nairobi entrepreneurs also reported avoiding sharing information with their networks due to concerns about intellectual property theft, caused in part by negative past experiences. Interestingly, based on such experiences, this threat was considered to be posed by representatives of large corporations, and not by other entrepreneurs, because large corporations were seen to be able to implement a project idea more quickly and efficiently than even the originator of the idea herself. Kathmandu and London respondents recognized IP theft as a possibility but largely concluded that the benefits of discussing ideas and hearing reactions and advice in response far outweighed any potential downside. In fact, in the case of Kathmandu, networking was reported to provide some protection against IP theft: if the community knew a particular idea belonged to a particular entrepreneur or team, it would be more difficult for it to be legitimately used by someone else.

The awareness and assessment of risks varies according to the level of development of each ecosystem: in the most nascent of environments, Kathmandu, entrepreneurs were most conscious of IP, or idea, theft by peers, possibly because employees of large corporations were not yet part of the networks and were, therefore, not perceived as direct threats, and also due to a high-profile incident observed during a Startup Weekend competition. In Nairobi, the “middle-of-the-road” ecosystem,

entrepreneurs were more wary of individuals employed by established corporations, and recounted anecdotes of having their ideas “stolen” by a device manufacturing firm. And in London, entrepreneurs were aware but not overly concerned about the risks of IP theft, presumably because they had developed coping mechanisms, such as limiting the sharing of information they deemed critical for their business, and could resort to a legal system to protect them, at least in theory (if not in practice, due to the costs involved).

7.1.4. Comparison of Constraints to Entrepreneurship Unrelated to Networks

Unsurprisingly, Kathmandu and Nairobi respondents reported greater constraints to entrepreneurship that were unrelated to social networks than did their London colleagues, although this does not mean that London respondents did not identify important shortages. In Kathmandu, the constraints included a lack of local mentors, unavailability of skilled labour willing to work in a startup (i.e. the graduate from technical tertiary education programs often chose to emigrate in search of more stable employment abroad), a lack of infrastructure to allow for monetization of apps (including appropriate policies, as well as institutions such as app stores), difficulty with accessing reliable Internet connections, and difficulty working with network operators who controlled the most important distribution channels for mobile apps. Similar constraints were reported in Nairobi: a shortage of skilled labour, in addition to difficulties with accessing reliable Internet connections and with working with network operators; perhaps surprisingly, Nairobi respondents also said they experienced significant difficulties with monetizing apps, despite the widespread use of mobile banking through MPESA. A shortage of skilled labour was also reported in London, although in this case it was not absolute but rather seen as a result of strong

competition for talent from the banking industry. Comments implying that Britain's immigration rules were stifling entrepreneurship potential were also made in reference to entrepreneurs having to leave the country due to their visas expiring. In addition, London respondents perceived an unwarranted lack of investor interest in early-stage and therefore risky ventures, and attributed this in part to the relatively small number of successful local entrepreneurs who understood the high technology sector and could reinvest their profits into new startups. This was seen to be a "chicken and egg" problem, although entrepreneurs were hopeful that the availability of early and growth-stage capital for London startups would improve over time.

The overall conclusion emerging from the three cases is that the three different ecosystems are connected to a global pool of relevant information and knowledge, via the Internet and through personal and organizational connections. They resemble one another not only in terms of resources sought by entrepreneurs, and in terms of reliance on their networks to obtain these resources, but also in the ways they signal their purpose and value to their community, and in the way they describe their environment—through references to other entrepreneurship ecosystems. The obstacles to growth are chiefly thought to relate to financing and labour shortages in each city, although the lack of availability of these is blamed on different factors. In London, the lack of financing is commonly explained by a culture of risk aversion—in comparison to the United States, while the lack of labour is explained by the dominance of the financial industry, which distorts the market for technically skilled talent. In Kathmandu and Nairobi, governance- and regulation-related constraints feature more prominently in the explanations given for insufficient financing and labour. The great speed of development of each mobile technology innovation ecosystem, referenced by respondents in each city, signals a global trend of technology

entrepreneurship as a career of choice. The similar response to constraints and opportunities in mobile technology—using Silicon Valley as the model of reference while building a local ecosystem—is linked to local and global connections of people, organizations and information, made easier by access to broadband Internet, among other factors of globalization.

7.2. The Big Picture: Shared Themes and Trends

The above groupings of results, while useful for the consideration of similarities and differences among the cases, should not be considered in isolation. The greatest challenge in interpreting data from individual cases, as well as in making comparisons across them, is related to untangling distinct concepts from one another. This difficulty points to the complex integration of various functions of networks and other components of entrepreneurship ecosystems. In each of the three cities, entrepreneurs frequently discussed, in the same breath, networks in the context of acquiring non-subjective resources, receiving community-support, taking on risks inherent in entrepreneurship, and the development of the overall ecosystem. Thus, many of the responses suggest that networks are used by entrepreneurs for different purposes at different times (and multiple purposes at once), that complex feedback loops are present throughout the networks and that untangling them without losing the holistic story would be not only difficult, but could detract from the many connections and areas of overlap.

To explore the overall meaning of the findings, it is worth discussing how the various themes interact, and what general conclusions can be drawn from such interaction. One such conclusion can be made in the area of entrepreneurship ecosystem development

trajectories. As it was expected based on their socio-economic and geopolitical characteristics, the three ecosystems vary in terms of opportunities and constraints for mobile entrepreneurs, and, unsurprisingly, these differences have an effect on the motivations of entrepreneurs to engage in networking. Kathmandu's mobile technology entrepreneurial networks are new—the first having started in 2010—and function informally, for the most part. Nairobi's entrepreneurial community is older¹² and better developed in comparison, with dedicated institutions, anchored by the iHub in recent years; however, it remains much smaller than London's ecosystem, which is also more advanced in many respects and is ranked as the second-best environment for startups (Startup Genome, 2012). Yet entrepreneurs in all three of these ecosystems speak about constraints present in their environment and many have a similar vision of what comprises an “ideal” ecosystem. Thus, it is helpful to consider the findings in terms of the question: what kind of ecosystem would be best at meeting the needs of entrepreneurs, and does this vary from location to location? While the emphasis of current networking activities may depend on the stage of development of a particular ecosystem, the findings point strongly to Silicon Valley as a model that inspires entrepreneurs in their efforts to build local networks and communities. Specifically, many of the responses imply that the Bay Area is understood as a self-renewing ecosystem, where successful entrepreneurs, local and international investors, *and society at large*, continue to support risk-taking done in pursuit of creation of new ventures by supplying a wide variety of resources through ever-evolving and expanding interpersonal networks. This image is captured by many popular sources, one version of which is captured by the consulting firm Accenture, and

¹² One milestone was the founding of AfriGadget, “a website dedicated to showcasing African ingenuity,” in 2006, by Erik Hersman, who would go on to be one of the key entrepreneurship champions in Kenya and founder of iHub.

reproduced in Appendix B.

If emulating California’s startup environment is the implicit, or even explicit, objective, what lies at the beginning of the path towards such an environment? If we envision the earliest stages in the development of an ecosystem as an environment characterized by few entrepreneurship networks and even fewer formal institutions, and later or mature stages as those with multiple, integrated networks and institutions, then the three cases can be broadly represented along a non-linear, “ecosystem development path” depicted in Figure 12, below.

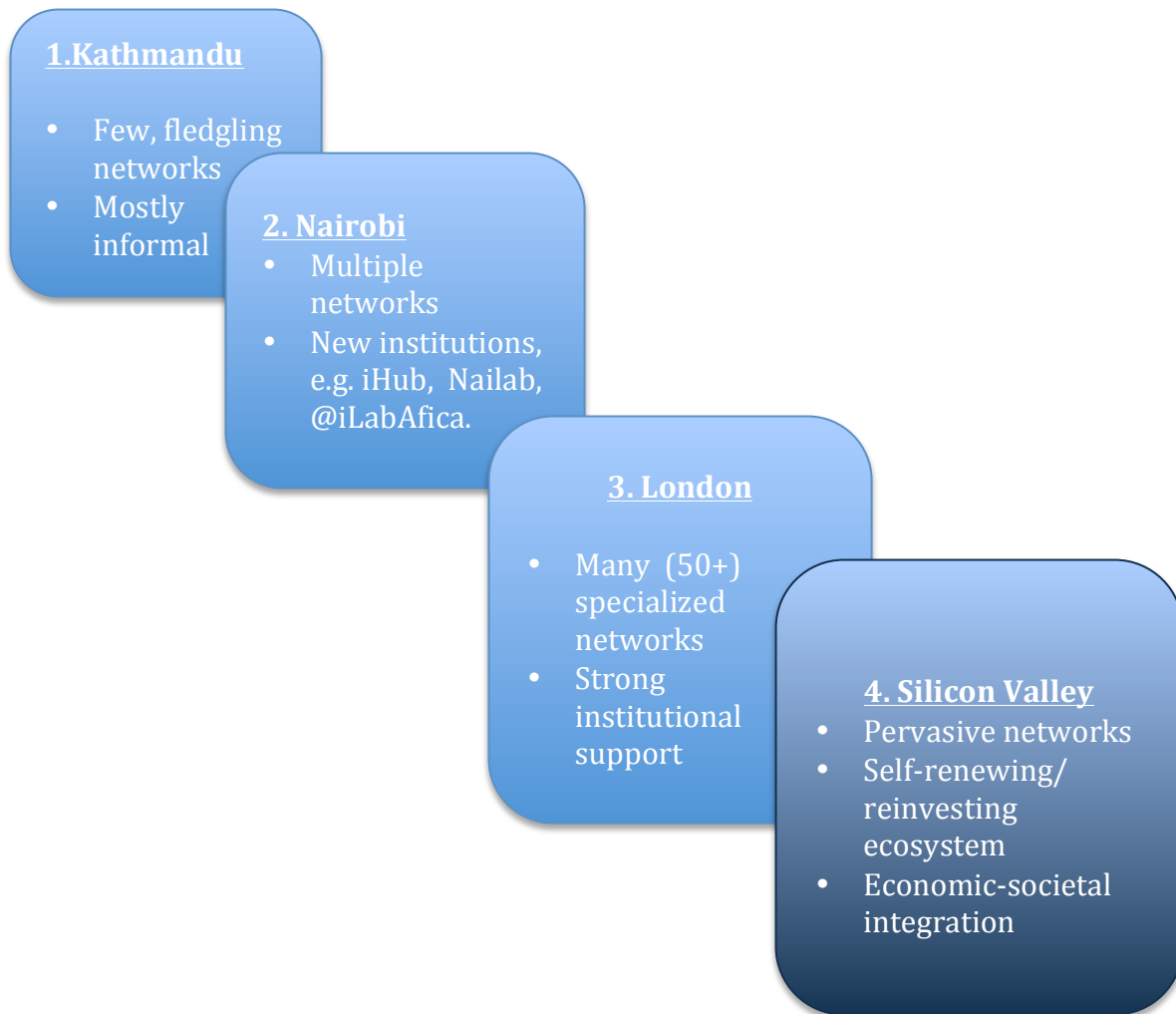


Figure 12: Kathmandu, Nairobi and London on an “ecosystem development path”

The stages along the non-linear “path” should be understood in terms of communities and networks and their integration into the economy and society, including via formal institutions. Thus, for instance, in Kathmandu, the emphasis of networking communities is on identifying existing and potential entrepreneurs and other types of members, educating them about possibilities in technology entrepreneurship, and locating, creating and pooling non-subjective and subjective resources necessary for entrepreneurial endeavors. By involving and co-opting a range of stakeholders, the community also works to increase understanding and legitimacy of entrepreneurship in wider society. In Nairobi, which has been recognized as a leading entrepreneurship centre in East Africa (see, for instance, Ortman, 2013), the primary focus of networks may be less on legitimizing entrepreneurial activity and more on increasing the technical skills of founders and teams to make them more “investable.” In London, where entrepreneurs enjoy a high level (comparatively speaking) of private sector and government support, the greatest concern may be on securing significant rounds of financing through networks. All of these point to not only a general trend toward increased institutionalization of entrepreneurial activity across the three case studies, but also to the specific process of imitating and referencing Silicon Valley, although the specific steps may be different. This is most likely to be occurring due to the region’s global prominence, and not due to the availability of other models (such as Israel’s, Finland’s, Taiwan’s, China’s or South Korea’s, for instance).

7.3. Literature Gap and Popular Policy Advice on Emulating Silicon Valley

A number of studies have examined the Bay Area and other successful entrepreneurial

regions in an attempt to describe the factors of their success, or, at least, some of the components of an environment conducive to innovative business start-ups (see Chapter 2, section 2.2). There is scant evidence, however, that the results of such research have widely informed policy makers and executives. McKelvey (2004) offers one explanation behind the apparent preference of decision-makers to take advice of consultants over that of academics, cited by Pfeffer and Fong (2002 in McKelvey, 2004). He contends that academic advice comes across as untrustworthy in one of two ways: one, most relevant studies to date have been in-depth case studies from a single setting, resulting in findings that are not necessarily applicable to others; and two, in rarer cases, when study design has allowed for generalizable conclusions to be made, only a small number of variables have been typically examined, so that causality can be clearly established between them; however this has also resulted in the omission of many other important variables and a lack of explanatory power about the overlapping interactions of multiple variables (McKelvey, 2004). In response, some entrepreneurship researchers have adopted a complex systems perspective, but their work is still in its early stages (see Alvarez & Busenitz, 2001; Lindsay, 2005; Lichtenstein et al., 2007).

In response to the demand for policy advice, and in the absence of robust academic conclusions, a smaller literature based on practitioner experiences has emerged around the topics of entrepreneurship and innovation ecosystem design. Although the distinction between entrepreneurship ecosystems and innovation ecosystems in this context is not precise (see Drucker, 2007), there are two unifying aspects of this literature: one is the goal to provide prescriptions that will encourage the rise of high-growth firms, and the other is the assumption that an environment conducive to entrepreneurial activity can be created or nurtured through policy instruments (see, for example, Mason & Brown, 2013).

In addition, a number of indicator-based projects have recently appeared, including the Global Entrepreneurship Monitor, whose goal is “to describe and measure, in detail, the conditions under which entrepreneurship and innovation can thrive” (Global Entrepreneurship Monitor, 2013), and the Global Innovation Index (GII), which measures seven categories of “elements of the national economy that enable innovative activities: (1) Institutions, (2) Human capital and research, (3) Infrastructure, (4) Market sophistication, and (5) Business sophistication [with additional categories that] capture actual evidence of innovation outputs: (6) Knowledge and technology outputs and (7) Creative outputs” (Global Innovation Index, 2014). In 2012, the GII placed an emphasis on the role of “collaboration, the flow of ideas between different innovation actors” and “the importance of linkages and of supporting the optimal infrastructure for [...] innovation ecosystems” (Dutta, 2012, p. v). Other observers assert that a successful ecosystem allows for collaboration and competition between established and new firms so that “strategic thinking and the entrepreneurial activities in an ecosystem influence one another in a cycle that perpetuates [...] innovation” (Zahra & Nambisan, 2012, p. 219).

Perhaps the most prominent, and in a sense most adaptable, current policy-focused ecosystem initiative is the Babson Entrepreneurship Ecosystem Project; its stated goal is “fostering an entrepreneurship ecosystem in which growth oriented entrepreneurial businesses can thrive” (Babson Entrepreneurship Ecosystem Project website, 2014), although its activities are analytical in nature, aimed at deriving recommendations for policy-makers, and not focused on providing practical support to entrepreneurs or institutions supporting entrepreneurship. The project is led by Daniel Isenberg, who contends that

[the] need for an ecosystem strategy stems from the observation that when we see

societies in which entrepreneurship occurs with any regularity or is self-sustaining, we see a unique, *complex* environment or ecosystem has evolved. This entrepreneurship ecosystem consists of a dozen or so elements (which we consolidate into six domains for convenience sake; see the diagram) that, although they are idiosyncratic because they interact in very *complex* ways, are always present if entrepreneurship is self-sustaining. So although the combinations are always unique, in order for there to be self-sustaining entrepreneurship, you need conducive policy, markets, capital, human skills, culture, and supports.

(Isenberg, 2011, p. 5, emphasis added)

where “supports” include infrastructure and support professionals such as lawyers and accountants (Isenberg, 2011). Figure 13, which is a reproduction of the diagram Isenberg refers to, summarizes the Babson Project’s approach to entrepreneurship ecosystem analysis.

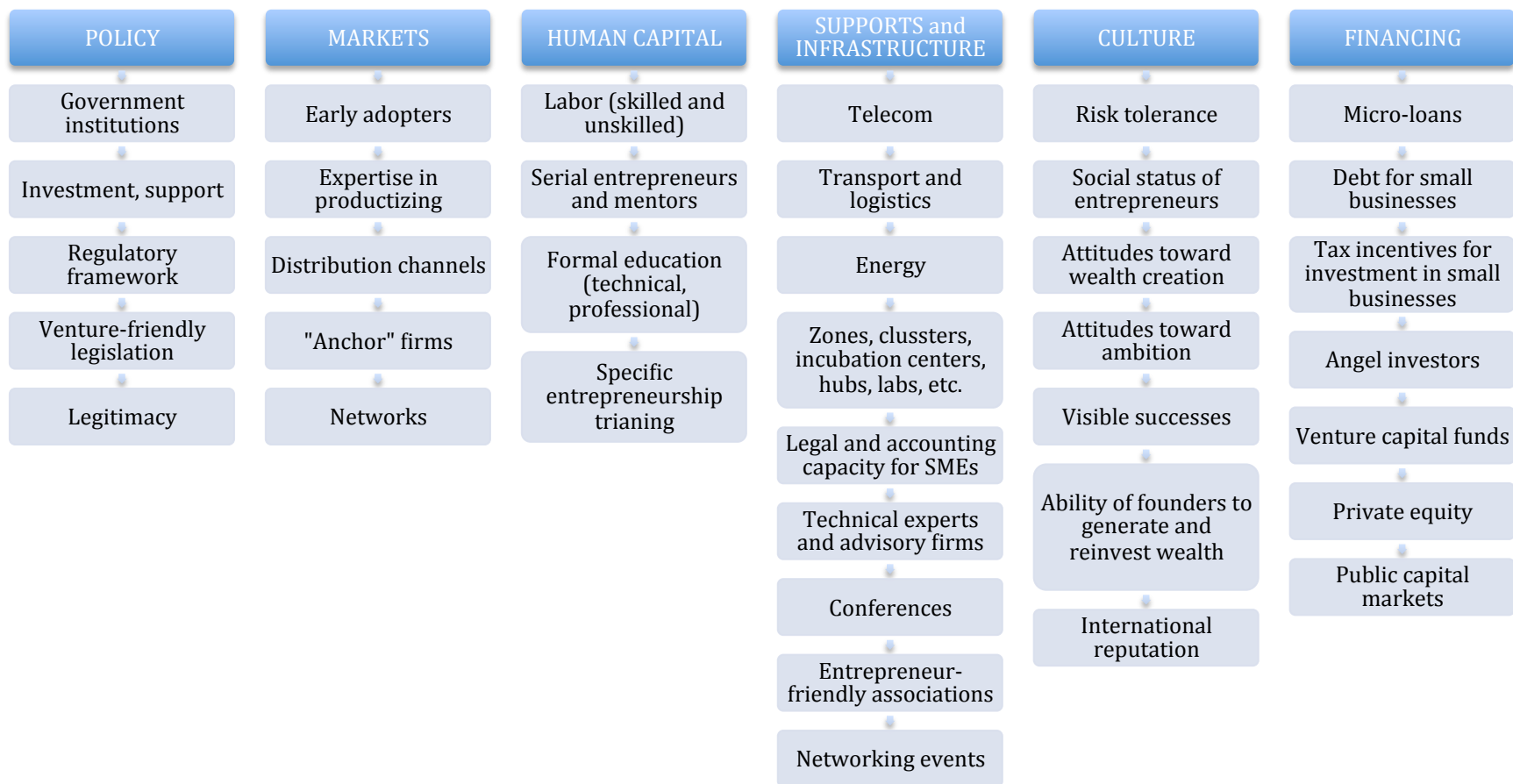


Figure 13: Domains of an Entrepreneurship Ecosystem (Adapted from Isenberg, 2011)

The initiatives discussed above (Global Entrepreneurship Monitor, Global Innovation Index, and the Babson Project) are examples of many other similar exercises, in that they describe an ecosystem as a collection of areas of activity that can be influenced by policy, and under which various supporting activities are suggested. Networks feature in all such models, although their placement differs. Isenberg assigns them to “markets,” while others situate them with clusters (see Dutta, 2011 & 2012) or “human” or “social capital” (see review by Burt, 2000). The conclusion Isenberg makes is that the system is too complex to rely on policies that support any one of its components. He writes that “the only way to solve this problem is holistically and specifically, by impacting the entire ecosystem and stimulating virtuous circles among all elements” (Isenberg, 2011, p. 9). He adds, however, that “there is tremendous uncertainty, and in every specific locale, responsible, informed experimentation and learning are required, but that is a part of the entrepreneurial process, isn’t it?” (Isenberg, 2011, p. 13).

In other words, the leading practitioners and scholars of entrepreneurship are left with more questions than answers when it comes to creating recipes for success of entrepreneurship ecosystems. In the absence of a better understanding of ecosystem dynamics, entrepreneurs, investors and policy-makers continue to take cues from Silicon Valley, with the hope of creating a self-renewing entrepreneurship environment. In countries where technology entrepreneurship is a relatively new area of economic activity, entrepreneurs seek to establish an ecosystem by demonstrating that entrepreneurship is a legitimate choice. In countries where technology entrepreneurship enjoys legitimacy in society as a whole, entrepreneurs benefit from community support as well as investment opportunities; recognizing the availability of both of these in Silicon Valley, they also

pursue this model. Given the lack of alternative models, it is no wonder these entrepreneurs seek to associate their ecosystems with Silicon Valley, a region whose success has increased the legitimacy of entrepreneurship not only locally, or within the United States, but also on a global scale, by promoting successful entrepreneurs as celebrities, encouraging failure as a necessary step toward success, attracting financing from a variety of sources, including the government, institutional investors and entrepreneurs themselves, and perhaps most importantly, creating an abundance of the subjective resource that is the sense of community.

7.4. Chapter Summary

In this chapter, the findings from the three cases of Kathmandu, Nairobi and London were integrated and compared in the context of the original research questions. The analysis showed that, despite large differences in the socio-economic context of the three ecosystems, striking similarities also exist. The findings were grouped into four categories: role of networks in community support, emerging institutions (providing support for entrepreneurship); motivations, benefits and risks of entrepreneurs' participation in networks; and constraints to ecosystem growth. In all three cases, social networks were perceived to be important for acquisition of resources; one of the most frequently mentioned such resource was community support, which added to entrepreneurs' self-efficacy. In Nairobi and Kathmandu, the community was also seen to be critical for establishing legitimacy of entrepreneurship as an economic choice. In each case, institutions were seen to have arisen from, or were at least closely connected to social networks of entrepreneurs and other ecosystem actors. In Kathmandu, entrepreneurship

institutions were least developed and consisted mainly of a small number of networking organizations; in Nairobi, the formalization of networking had led to the establishment of tech hubs and regular networking groups that sought to fill the gaps in support for entrepreneurs left by the lack of involvement by traditional institutions; in London, strong institutions that support entrepreneurship were found to exist, and these included numerous community-based initiatives like networking groups and tech hubs, along with government schemes to encourage investment in technology startups at various stages of growth. Most interesting was the common referencing of, and comparison to, Silicon Valley as the model entrepreneurship ecosystem. Based on the extent of institutionalization of entrepreneurship support and the way in which such support was described by interview respondents, the three ecosystems could be plotted on an “ecosystem development continuum,” which showed Kathmandu at the earliest, and London at the latest stage of development inspired by the Silicon Valley example. Shortage of labour, investor risk aversion, and access to affordable office space and/or reliable Internet connectivity were found to be some of the major common constraints to the growth of the three entrepreneurship ecosystems.

The similarities in terminology used, the frequent comparisons to other entrepreneurship ecosystems, and the common features of entrepreneurs’ networks and organizations that support them lead to the conclusion that the entrepreneurship communities in the three cities have access to a common set of globally available knowledge and information, whether via communication technologies such as the Internet, their personal connections, or their organizational links. As a result, they share a set of reference points to what they perceive to be a functional entrepreneurship ecosystem. The integration of that knowledge—evident in the common features of the three ecosystems,

the resemblance of the entrepreneurs' descriptions of their motivations for networking and the risks and benefits involved, and the shared goals for improving the environment for entrepreneurship all point to a process of structural convergence.

In order to consider broader implications of the results, a brief review of literature related to entrepreneurship ecosystem development was presented, with the conclusion that few academic and practitioner sources provided a clear framework through which to consider the similarities, or convergence, of the three ecosystems. The next chapter will further explore theoretical concepts that make such analysis possible, and propose a theoretical blueprint that could be applied to the analysis of fledgling entrepreneurship ecosystems around the world.

8. Institutional Isomorphism and Related Theoretical Concepts

Recognizing the tendency towards “siliconization” of other entrepreneurial ecosystems around the world leads to the question of why and how it occurs. This chapter revisits literature on entrepreneurial networks, with an emphasis on institutional perspectives, and combines existing theory with this study’s findings to propose a framework of entrepreneurship ecosystem development. Institutional entrepreneurship and institutional isomorphism were briefly discussed in section 2.6, but the bulk of the discussion related to both is reserved for this chapter, where it these concepts can be used to analyze the findings of the study.

Much of the available literature on entrepreneurial networks places an emphasis on non-subjective economic resources at the expense of subjective, but equally influential and important notions such as community, legitimacy and efficacy, which were discussed in Chapter 2. The reason for this seems to be that subjective resources are difficult to measure. One notable exception is Johannisson (1995) who sees the role of networks in providing social support, acting as a resource supply and maintaining strategic tensions necessary for maintaining commercial viability.¹³ Johannisson’s “social support” can be seen as a type of subjective resource, as proposed by Arenius and Minniti (2005), in the case of the resulting increase in confidence and commitment to act in an uncertain environment. The findings of this study show that while pursuit of non-subjective resources is certainly one of the strong motivations for entrepreneurs’ participation in networks, the opportunity to pursue subjective resources via social

¹³ See Chapter 2 for a detailed discussion of Johannisson’s framework.

support, such as self-efficacy and legitimacy, provide equally strong incentive, at least for entrepreneurs in Kathmandu and Nairobi. Further, the network cannot be envisioned as simply a resource “supermarket,” i.e. a place where resources can be obtained in a simple transaction. Rather, there are many areas of overlap and unpredictable feedback loops, and this is particularly the case with resources that simultaneously act as communications tools and product delivery channels such as the Internet, or those that double as sources of knowledge and connectors to other resources, such as peers, mentors or employees. The networks in each of the three cases have been found to play an important role in the development of entrepreneurship ecosystems, and, indeed, in promoting the model of the San Francisco Bay Area for such development. An important reason for this is obtaining legitimacy for entrepreneurship as an economic activity.

8.1. Legitimacy by Association and Domain-Defining through Networks

Wiewel and Hunter (1985) discuss the interplay between acquisitions of different resources against the “liability of newness” (Stinchcombe, 1965) experienced by fledgling organizations. Although their context is not strictly related to entrepreneurs, their ideas are relevant for analyzing entrepreneurship ecosystems. Wiewel and Hunter (1985) find that new organizations use networks to locate resources, increase their legitimacy necessary to claim resources and define the domain of their activities. They further suggest that a new entity, which has “nothing to offer but promises” (Wiewel & Hunter, 1985, p. 486), will resort to associating itself with existing organizations in

order to “trade on the credit” (Wiewel & Hunter, 1985, p. 486) of the older entity as a way to acquire resources.

While Wiewel and Hunter focused on community organizations in their work, the conclusions they make are also accurate when considered in light of data collected on entrepreneurial networks in Kathmandu, Nairobi and London. In these cases, the older organizations with which entrepreneurs seek to associate are success stories such as Google, Apple and other startups that have grown into major global corporations; further, the data suggest that the members of local networks aspire to associate their ecosystems with Silicon Valley as an entity or institution in and of itself. Related to this is the mediation, or interpretive function of networks between entrepreneurs’ activities and society’s expectations of them. In all three cities, entrepreneurs expressed dissatisfaction with the fact that their environments (families, friends, investors, etc.) did not encourage risk-taking to the extent they perceived this to be the case in the United States. Thus, for instance, a top graduate in Nairobi is still likely to be expected by her family to seek a stable job in government or the financial industry. She can only win the support of her immediate community if that community has interpreted entrepreneurship as a worthwhile endeavour, which includes accepting the risks inherent in it. Such societal pressures can be a powerful behavioural force, which entrepreneurs must overcome. In each of the three cases, networks were found to be anchored by hubs and meetups that act as the cornerstone institutions of the entrepreneurial ecosystem; many of them also share formats, physical layouts and methodologies. In addition to serving entrepreneurs, these institutions also act as mediation channel between the entrepreneurs and society at large, providing a sense of

organization, legitimacy and familiarity, including through evoking Silicon Valley references and creating a locally recognizable set of identifiers for entrepreneurship activities. In other words, by using the Bay Area terminology and structures, entrepreneurs use networks to make sense of their pursuits for those around them, and for themselves, thus engaging in domain-defining activities described by Wiewel and Hunter (1985).

8.2. Institutional Isomorphism Applied to Entrepreneurship Ecosystems

In all three cases, the local entrepreneurial networks were found to play a role in a global exchange of ideas. Far from being unaware of entrepreneurship trends and practices in other parts of the world, respondents from each of the three cities compared their community to other ecosystems. Silicon Valley was mentioned explicitly and referred to implicitly in each case, with London entrepreneurs particularly focused on how their environment for startups compared to California's. In London, a small number of them also questioned the wisdom of such comparisons, attesting to their consciousness of this tendency to collective. As shown in Figure 12 above, the three locales can be envisioned as being at different points on a path between an early-stage and small entrepreneurial network (or ecosystem), such as that in Kathmandu, and a highly sophisticated environment such as Silicon Valley.¹⁴ Considered this way, the three ecosystems examined appear to be going beyond simple association with a successful model but indeed tending toward the same goal, and, thus, appear to be in the

¹⁴ Figure 12 is a necessarily oversimplified representation of reality, and is only used to indicate degree of similarity with SV.

process of homogenizing. DiMaggio and Powell (1983) provide a strikingly fitting theoretical framework through which to consider these changes. According to them, “once a set of organizations emerges as a field, a paradox arises: rational actors make their organizations increasingly similar” (DiMaggio and Powell, 1983, p. 147). Considered in the present context, the “set of organizations” is composed of different entrepreneurship ecosystems around the world; these are not the type of organizations DiMaggio and Powell had in mind, however, their theory remains applicable. DiMaggio and Powell propose three types of isomorphism: coercive, occurring primarily via regulation; mimetic, occurring in response to uncertainty; and normative, resulting from pressures involved in the professionalization of a field. While the focus of DiMaggio and Powell’s work on institutional isomorphism refers to individual firms, state actors or the professions within a single location, this study’s results suggest that something similar is taking place among entrepreneurship communities located very far from each other around the globe. In particular, the findings point to Kathmandu, Nairobi and London entrepreneurs relying on mimetic processes (also referred to as modeling) to achieve the same objective: provide a supportive environment for startups.

DiMaggio and Powell (1983) further hypothesize that “the more uncertain the relationship between means and ends the greater the extent to which an organization will model itself after organizations it perceives to be successful” (p. 154) and that “the more ambiguous [or disputed] the goals of an organization, the greater the extent to which the organization will model itself after organizations that it perceives to be successful” (p. 155). To guard against uncertainties, new organizations are said to rely on previously legitimated and institutionalized procedures to survive. DiMaggio and

Powell call this process institutional isomorphism, and relate it to Weber's concept of increasing rationalization of all social activity (Weber, 1930). They distance themselves from Weber's view that with capitalism, the rationalist order, as an efficient and powerful means of controlling people, has become an "iron cage" in which humanity is imprisoned. According to their interpretation of Weber, bureaucratization (the manifestation of rationalization in organizations) resulted from three related causes, the most important being the pursuit of efficiency through competition among capitalist firms, followed by competition among states, and the demands of the middle class for equal protection under the law. DiMaggio and Powell, however, argue that the forces behind bureaucratization have changed, and that the pursuit of efficiency has given way to processes that assimilate organizations without necessarily making them better at managing resources. They use the term "isomorphic" to describe the processes of homogenization within a given field. Although they allow for other types of entities, their sole focus is on isomorphism among institutions, perceived as a process of convergence that leads to similar organizational forms across a particular field. While in practice the three types of institutional homogenization (coercive, mimetic and normative) are often combined and hard to distinguish empirically, the differences originate from the variance in the conditions in which the institutions operate. Thus, coercive isomorphism stems from pressure, formal and informal, exercised by existing entities (including government institutions) upon which the organizations in question depend, or by relevant social expectations that favour certain organizational forms; mimetic isomorphism is the shaping of organizations after a certain model or models in response to uncertainty involving ambiguous causes or unclear solutions, and of which

the modeled organization need not be aware; normative isomorphism stems primarily from professionalization, that is from the cooperative struggle of professionals to have control over their domain and “to establish a cognitive base and legitimation for their occupational autonomy” (DiMaggio & Powell, 1983, p. 152). In an ambience of organizational diversity, tendencies towards isomorphism cause a shift from (organizational) diversity to (organizational) homogeneity.

In contrast to previous work in institutional theory, DiMaggio and Powell (1983) ask why there is a startling similarity of organizational forms across professional fields and try to explain organizational homogeneity rather than organizational heterogeneity, in contrast to previous work in organizational theory. According to them, homogenization stems from the structuration of an organizational field. When using the term structuration, they refer to Anthony Giddens, that is to the idea that established social structures condition human behavior and thinking without predetermining them: human agency changes social structures, even though it is, in itself, conditioned by them (Giddens, 1979, in DiMaggio and Powell, 1983). With the term “organizational field,” DiMaggio and Powell refer to the totality of relevant actors in a “recognized area of institutional life, such as suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products” – which would cover idea of a global entrepreneurship field, consisting of various entrepreneurship ecosystems, as discussed in this study. They further claim that any initial diversity is eventually replaced by a dominant organizational model:

What we see in each of these cases is the emergence and structuration of an organizational field as a result of the activities of a diverse set of organizations;

and, second, the homogenization of these organizations, and of new entrants as well, once the field is established.

(DiMaggio & Powell, 1983 p. 148)

In this context, the term organizational field points towards the importance of connectedness and structural equivalence.¹⁵ The first, connectedness, includes not only formal contractual relations, professional associations, unions, boards of directors, etc. but also informal organizational-level ties like personal flows; such informal ties are analogous to the entrepreneurial networks found in Kathamandu, Nairobi and London. The second, structural equivalence, refers to the close resemblance of actors across networks of social relations, not in absolute terms but as they relate to their roles and functions within the network. In other words, DiMaggio and Powell (1983) use the term equivalence to refer to position within a network structure and consider two organizations to be equivalent if they have ties to the same set of organizations, even if they are not directly associated to each other. While this study did not map relationships between the three ecosystems and others, the commonality of references to Silicon Valley indicates a degree of equivalence, as defined by DiMaggio and Powell, within a loosely structured, still emerging field of mobile technology entrepreneurship. DiMaggio and Powell suggest that the result of such structuration is a kind of ossification that prevents further adaptation—a conclusion that is ironic in the context of entrepreneurial activities meant to result in generating innovation.

Once disparate organizations in the same line of business are structured into an actual field (as we shall argue, by competition, the state, or the professions), powerful forces emerge that lead them to become more similar to one another. Organizations may change their goals or develop new practices, and new organizations enter the field. But, in the long run, organizational actors making

¹⁵ As the source of the term *structural equivalence* DiMaggio and Powell cite White et al. (1976). However, the idea of White and his followers will not be discussed here.

rational decisions construct around themselves an environment that constrains their ability to change further in later years.

(DiMaggio & Powell, 1983, p. 149)

DiMaggio and Powell's approach is compatible with the initial idea of this study, which was to point out similarities within the emerging professional field of mobile entrepreneurship in three highly different entrepreneurial ecosystems. What is even more important, the findings related to the aspirations of entrepreneurs in Kathmandu, Nairobi and London to help develop their ecosystems by following the famous California model support DiMaggio and Powell's isomorphism theory in a significant way. The latter is surprising in that the field itself has been one of the fastest developing and, above all, geared towards innovation, not only in terms of new technologies and their applications but also in terms of introducing the organizational form of start-ups and their formal and informal ways of information exchange and cooperation into different economic, geographic and social contexts. The three cases show that mobile technology entrepreneurs have opened up the space for important organizational changes to their respective environments, especially with regard to non-traditional modes of economic activity. It is significant that, for instance, despite the fact that London entrepreneurs reported difficulties with competing with the established financial industry for talent, some of them had succeeded in recruiting employees away from jobs in the banking sector, which are conventionally perceived as good career options for skilled professionals. In Kathmandu, the success with establishing a mobile money platform without the cooperation of mobile network operators (at least initially) is another example. In Nairobi, the prominence and influence of the iHub demonstrates a remarkable success in institution building within the local environment.

Even though the field is relatively young and quickly developing, what DiMaggio and Powell call mimetic isomorphism is an obvious trend. In addition, although the interviewed mobile entrepreneurs and their communities do not belong to the kinds of entities DiMaggio and Powell cite as their examples, it is obvious that in some respects the communities entrepreneurs have built do behave in ways described by the two authors. The popularity of the San Francisco Bay Area narrative in all three ecosystems supports the claim that “organizations tend to model themselves after similar organizations in their field that they perceive to be more legitimate or successful” (DiMaggio & Powell, 1983, p. 152). In all three cases entrepreneurs evoked organizational models (hubs, labs, meetups, Startup Weekends, Demo Nights, etc.) in an effort to enhance the performance of their own firms and to attract investors by diminishing the perception that their enterprises are risky investments.

As has already been mentioned, DiMaggio and Powell (1983) warn against the assumption that the proliferation of particular institutional models constitutes proof of increased efficiency or other type of improvement; instead, they postulate that the reason is a universal tendency to engage in mimetic processes:

The ubiquity of certain kinds of structural arrangements can more likely be credited to the universality of mimetic processes than to any concrete evidence that the adopted models enhance efficiency.

(DiMaggio & Powell, 1983, p. 152)

They further hypothesize about the predictors of isomorphic change, which can be spotted at the organizational level or at the field level. At the organizational level, the first two hypothetical predictors derive from coercive isomorphism, the third and fourth derive from mimetic isomorphism, the fifth and sixth from normative isomorphism.

Since the study cases have exhibited evidence of a common tendency towards mimetic

isomorphism, but little explicit indication of isolated coercive or normative mechanisms, only the third and fourth hypotheses at the organizational-level are pertinent for our discussion. According to the third organizational level hypothesis regarding predictors of isomorphism,

The more uncertain the relationship between means and ends, the greater the extent to which an organization will model itself after organizations it perceives to be successful.

(DiMaggio & Powell, 1983, p. 154)

In all these cases, entrepreneurs experience high levels of uncertainty stemming from limited access to resources needed to achieve their aims. In addition, due to the dynamic nature of the mobile technology industry, startups founders frequently change their strategies as they learn about new market trends, improve their own abilities and discover new opportunities; this makes their long-term goals uncertain in all but the broadest of terms (such as achieving profitability and growth). Thus, in an effort to reduce overall uncertainty, and increase chances for success and survival, entrepreneurs resort to pursuing models seen as successful. In this way, they contribute to future homogeneity, according to DiMaggio and Powell's fourth organizational-level hypothesis:

The more ambiguous the goals of an organization, the greater the extent to which the organization will model itself after organizations that it perceives to be successful.

(DiMaggio & Powell, 1983, p.155)

In the case of nascent technology entrepreneurs, the goals tend to be ambitious, but broad: to produce innovative products and services more efficiently than the competition. The specific ways of going about pursuing such goals, however, are

uncertain.

At the field level, there are also six hypothetical predictors, of which the third is directly applicable to the three cases discussed here:

The fewer the number of visible alternative organizational models in a field, the faster the rate of isomorphism.

(DiMaggio & Powell, 1983, p.155)

The organizational models in the field of technology entrepreneurship are scarce, and the one universally, globally known and recognized as successful is that of Silicon Valley. While other ecosystems, such as those in Israel, Taiwan, Finland, or the Boston area are well known among entrepreneurship researchers (for instance, see Roper and Grimes, 2005; Lin et al., 2006 and Friar and Meyer, 2003), they are not nearly as popular among entrepreneurs and the general publics around the globe.

Another link between Powell and DiMaggio's theory and the results of the field study presented here relates to the progressive nature of convergence. Institutional isomorphism occurs in stages: at first, organizations change constantly, but then, at a certain point of the structuration of the field, they give impetus to processes of organizational homogenization, until a dominant organizational form emerges (DiMaggio & Powell, 1983). While the Silicon Valley model may not prove to (or can hardly) be that form, one can see the associated narrative as a symbolic sign of an institutionalization to come. This is what has been happening in the three mobile environments studied: in all three, entrepreneurs first introduced forms of organization that were both new to their environment and more loosely structured than the established, dominant organizational models; with time, they have been working to firm up these new models, because they have been proven (or are perceived) to work in the

world at large. It is finding some commonalities of broader significance like this one that demonstrates advantages of the choice to study very different ecosystems: without the London case, one could misunderstand some of the study findings as limited to low-income countries that look to rich economies for guidance and knowledge especially in the domain of new technologies and their applications; however, as the London case shows, mobile entrepreneurs in the capital of one of the most industrialized countries in the world also look for a proven model they can implement in their environment.

8.3. Can Isomorphic Mimesis Lead to Innovation?

Since solutions to their particular problems are mostly unclear, and since their enterprises take place in the still uncharted, risky territory of high technology innovation, entrepreneurs look for and try to implement models based on successful organizations in the same field. In doing so, they may disregard specificities of their concrete business contexts and risk the peril of implementing organizational models that will not make them more efficient and may not in fact improve their position in any way. This coincides with the already mentioned conclusion by DiMaggio and Powel that isomorphic processes do not necessarily make organizations more efficient. In their study of the US electricity industry, Granovetter and McGuire (1998) also conclude that “if technology and organizational form actually followed from efficiency considerations, we should have seen considerable variation by area, since what was efficient varied dramatically according to local circumstances” (p. 162). Similarly, the socioeconomic conditions in Katmandu, Nairobi and London do not only differ from one another but are markedly distinct from the conditions in the Bay Area, making it unlikely that this model is the best, or even a possible one to implement.

Simply assuming that Kathmandu, Nairobi and London entrepreneurs are blindly following the Silicon Valley schema would be hasty. Instead, it is worth considering what is driving their mimetic behaviour. Once again, DiMaggio and Powell¹⁶ offer an alternate explanation, although they only allow it to become applicable after the effective equivalent of an ecosystem is formed: “once professional field is structured, early adopters of organizational innovations strive not only to improve performance but also to gain legitimacy” (1983, p. 149). The pursuit of legitimacy certainly makes sense as a strong motivation for emulating Silicon Valley, especially in light of societal pressures for technically skilled entrepreneurs to follow less uncertain paths.

Another possible explanation is simply the need to learn, and the lack of alternative sources of knowledge. Mimetic behaviours have long been recognized as a “natural” way of learning, acquiring and developing skills and appropriate behavioural modes. According to Golden, Aristotle wrote that “the importance of mimesis for man is that it involves a learning experience and that the chief pleasure which man derives from mimesis is the pleasure of learning” (Golden, 1969, p.146). The Oxford English Dictionary takes into account a possible goal of mimesis that extends to influencing society, when it defines mimesis as “the deliberate imitation of the behaviour of one group of people by another as a factor in social change” (“Mimesis”, n.d.).

All three of these potential drivers of mimesis are likely to be present in the

¹⁶ DiMaggio and Powell refer to a number of authors and works on organizational theory which are relevant to their approach: among them are John W. Meyer, Marshall Meyer, Brian Rowan, Philip Selznik, and Thomas Schelling to mention just a few. However, an analysis of the ways organizational theory approaches organizational diversity and homogenization is out of the scope of this study.

behaviour of entrepreneurs. There is little doubt that in London, like in Nairobi and Katmandu, mimetic behaviours are linked to the will to learn, through imitation, about organizational arrangements that would meet their specific needs, including the need for increased legitimacy and resulting social change that would expand their scope for pursuing opportunities. The role of mentors should not be neglected in this process: they direct entrepreneurs to mimic successful business behaviour practiced by others, at home or abroad. As has been mentioned above, however, the danger inherent in mimetic behaviour is that of oversight and neglect of the socioeconomic and cultural specificities of a given local context, not only because these could be make a chosen model unsuitable or even irrelevant, but also because pursuing a prefabricated model may prevent the unique aspects of a given local ecosystem from being integrated and may undermine the capacity of local actors to design new models customized to their needs, risks and opportunities. In a very traditional environment, it can also decrease their chances of gaining social or financial support.

8.4. Aspirational Isomorphism and the “Myth” of Globally Visible Institutional Models

According to Bruton et al. (2010), entrepreneurship researchers have turned to institutional perspectives in recent decades, due to a lack of emphasis on social motivations that drive organizational action (Barley & Tolbert, 1997 in Bruton et al., 2010). Building on the works of DiMaggio (1988), Fligstein (1997), Rao, Morrill and Zald (2000) and others, institutional entrepreneurship scholars have examined how new institutions are created or existing ones changed (Bruton et al., 2010). Institutional

entrepreneurship studies have covered a wide variety of fields, including entrepreneurship itself, or related arenas such as venture capital (Bruton et al., 2010).

In their review of work at the intersection of institutional theory and entrepreneurship, Bruton et al. cite Fang (2010) and Scott (2007) in order to note that institutional rules, norms and beliefs that shape organizations differ across geographies and societies. However, regardless of those differences, establishing legitimacy is seen as one common purpose of institutionalization of new enterprises, although the route to obtaining legitimacy may differ:

When the founders of any new venture seek legitimacy for their activities (and those of their industry), the social context in which they operate encourages different strategies to establish or build legitimacy.

(Aldrich & Fiol, 1994 in Bruton et al., 2010, p. 427)

Another commonality, independent of geographic or industry focus, is that the goal of institutional entrepreneurs is for certain “structures, processes, and mindsets” to either avoid scrutiny altogether, or to be judged as suitable and appropriate (Jepperson, 1991 in Bruton et al., 2010). Bruton et al. go on to note that knowing the local norms and rules is essential for firms – domestic and foreign – as they seek to find congruence between their existence and that of their cultural environment (Meyer & Scott, 1983 in Bruton et al., 2010). They further recall studies from China, India and Latin America, emphasizing the need for entrepreneurs to be familiar with and adapt to local institutional practices if they are to be successful. Another sub-field examining entrepreneurship in different countries is that of transnational entrepreneurship, or TE. In a summary of main TE studies, Drori et al. (2009) specify that transnational entrepreneurs are individuals who identify and exploit opportunities that result from

these individuals' experiences and networks in two different countries or fields, by optimizing resources where they are most needed. None of these approaches, however, consider global institutional norms or models as useful for establishing local and international legitimacy. Further, while there have been many studies on the influence of particular economic models on local business practices around the world, a theoretical treatment of a global model (or even models) of entrepreneurship ecosystem development, which would have been very useful to the analysis of the three cases, has not been established.

Instead, some of the theories of the exportation of particular economic models offer useful insights. In particular, Marie-Laure Djelic examines the international appeal of American corporate capitalism and its "cross national transfer" in her 2001 book, *Exporting the American Model*. In the context of examining the adoption of "the American model" of corporate capitalism by France, West Germany and Italy in the period after World War Two, she proposes the following set of conditions that makes such a process more likely:

The comparative and historical study has shown that a number of conditions should be met simultaneously in order for a large-scale, cross-national transfer process to be possible, to be contemplated, and eventually to be launched. First of all, a traumatic disruption should bring, at the national level, an acute *sense of crisis and a questioning of the legitimacy* of preexisting institutional and structural arrangements. Then a redefinition of the geopolitical environment and, in particular, the emergence of relationships of asymmetrical dependence, should turn *a foreign system of industrial production into an available model*, in other words one which is *both familiar and perceived to be superior*. Finally, a *cross-national network of actors*, sharing similar and compatible if not common objectives should bridge the gap between both countries. These 'modernizing' individuals may be only a small minority within their respective national environments. They should nevertheless hold and control key positions of power both within cross-national institutional channels, and in those national

institutions located at the articulation of state and economy in the receiving country, which are bound to play an essential role in the transfer process. This set of three conditions, it has been proposed, will significantly increase the likelihood that a large-scale, cross-national transfer process be considered and eventually launched in a given situation.

(Djelic, 2001, p. 280-281, emphasis added)

Applied to the diffusion of the Bay Area model of entrepreneurship ecosystem development, and taking into account findings from the three cases of Kathmandu, Nairobi and London, Djelic's requirements are useful, but may be too stringent. For instance, it would be difficult to find that "traumatic disruptions" (let alone a common traumatic disruption) leading to a "sense of crisis and a questioning of the legitimacy" of existing institutions had occurred in each of the three contexts. One could make the case that an ongoing questioning of legitimacy of existing institutions is present in modern Kenyan society (see, for example, Throup, 1993 and Murunga, 2004), but it would take a great leap of logic to conclude that entrepreneurship resulted from it; on the contrary, entrepreneurial traditions have been present among Kenya's ethnic groups for a long time, as discussed in Chapter 5. In Nepal, the violence of recent decades ended in the solidification of socialist rule, arguably strengthening the legitimacy of existing institutions, which entrepreneurs interviewed for this study characterized as lacking in ability to support entrepreneurs. Finally, Britain has enjoyed political and economic stability since World War Two, with few major challenges to its governance system or other institutions. Thus, Djelic's first requirement does not seem to apply to the adoption of the Silicon Valley model of entrepreneurship ecosystem development in Kathmandu, Nairobi and London. However, the second two requirements— asymmetrical relationships that make a foreign model available and desirable, and

cross-national networks--do apply, and are related. The entrepreneurs in all three cities are connected to global fora where entrepreneurship is discussed and promoted, including via the Internet, and their networks are composed of compatriots as well as émigrés and international contacts; a number of entrepreneurs also travel frequently to other countries, and may have lived abroad. Further, the entrepreneurs are aware of resources available outside of their immediate environment, and understand that their relationships with others may be asymmetrical in terms of ability to acquire such resources. Some of those resources are related to knowledge about the Silicon Valley blueprint, and the entrepreneurs rely on their network contacts to help them introduce the model and establish it as superior to alternatives available in the local environment. However, they also adapt and appropriate the model to suit their own needs.

Such customized mimetic behaviours employed in pursuit of legitimacy, learning, and achieving the prominence and perceived success of an institutional model, can be termed “aspirational isomorphism” (M. Ventresca, personal communication, March 30, 2015). Aspirational isomorphism can be further defined as a type of mimetic behaviour in the context of pursuing a specific outcome, perceived to be related to an existing institutional model. In aspirational isomorphic behaviour, the existing, prominent institutional model is interpreted by the group seeking certain outcomes. Such an interpretation of the existing institutional model—which can vary greatly from the “original” to allow adaptation to the local context—can then be embedded in the nascent institutional environment (in this case, an entrepreneurial ecosystem). Aspirational isomorphism is thus not a case of pure mimesis, but rather a flexible process that integrates local and global conditions and actors, with the objective of

locally achieving a specific goal, perceived to have already been attained elsewhere through a globally-recognized institutional model. As such, the “path” from a nascent entrepreneurship ecosystem is not linear, but rather adaptive, even if the direction (towards the specific goal) is pre-determined and shared between nascent ecosystems in different locations. In this process, the globally-recognized institutional model is itself adapted from reality to a “mythical” version of itself that best serves the objectives of local actors. Local entrepreneurs then rely on storytelling¹⁷ and heroic characters (such as accomplished Silicon Valley startup founders and teams) to adapt their own institutional environment to better suit their aspirations and needs. In the cases of Kathmandu, Nairobi, and London, the initial institutional environments were very different. In Kathmandu, a strong government role in incubation and entrepreneurship, and an association of IT industry professionals (discussed in Chapter 4) who did not pursue entrepreneurial endeavors, served as examples of institutions that were not effective in terms of opening global and local economic opportunities to technology entrepreneurs. Instead, local software programmers were exposed to global market opportunities by working for western companies reliant on outsourcing of IT services. In Nairobi, liberalization of the ICT sector, investments in broadband Internet and mobile infrastructure, the introduction of mobile money by the telecom incumbent Safaricom, and the resulting improvements in access to mobile technologies contributed to a growing local market and allowed for linkages between local entrepreneurs and global players in the mobile industry investing in Kenya. In London, the dominance of the financial services industry (and to some extent, the creative media and design

¹⁷ As discussed in Chapter 2, storytelling has been well-established in the literature as a strategy employed by entrepreneurs in the pursuit of legitimacy for their ventures (for recent discussions, see, for instance, Andersen & Rask, 2014, and Lefsrud & Jennings, 2013).

sectors) may have delayed the development of local software entrepreneurship, despite London's advanced and globally connected economy. In each case, however, these challenges turned into sources of opportunity: for instance, due to the relatively closed economy, Nepalese entrepreneurs benefited from a uniquely detailed level of knowledge about their own market; Kenyan entrepreneurs benefited from opportunities created by one of the world's most-developed mobile money networks; and London-based software entrepreneurs sought to connect their activities to established businesses in banking and media.

8.5. Towards a Global Framework of Entrepreneurship Ecosystem Development

The relevant components of DiMaggio and Powell's framework—originally developed with localized organizational fields, and not with global phenomena in mind, can be combined with some elements of the framework developed by Djelic to account for institutional isomorphism at the international level. After adapting this combination based on the practices found among Kathmandu, Nairobi and London entrepreneurs, a globally-relevant framework of entrepreneurship ecosystem development can be proposed. Concretely, a particular archetype of an entrepreneurship ecosystem is expected to arise in different contexts under the following conditions:

1. Emergence of a new industry, or a period of dynamism in an existing industry, characterized by significant entrepreneurship opportunities along with uncertainty about the exact nature of those opportunities as well as uncertainty about the means through which those opportunities can be pursued.

2. A small number of globally visible alternative models of entrepreneurship ecosystem development.
3. Asymmetrical relationships (for example, economic) that make a particular foreign model available and desirable.
4. Local and global networks that allow for knowledge exchange, mentoring and, ultimately, the appropriation and implementation of a particular model in other parts of the world.

The mechanisms through which local actors introduce components of a model they perceive to be superior to all others include storytelling and mimesis, facilitated by networking events, such as meetups organized by Mobile Nepal in Kathmandu, Pitch Nights in Nairobi or Mobile Monday events in London, and by technology hubs, such as the iHub in Nairobi, or TechHub in London. These new institutions act as the focal points for those working to introduce the model to the local environment, and offer opportunities for local entrepreneurs and key ecosystem actors to learn, apply and propagate the spread of terminology and methodologies that comprise the imported model, in this case that of Silicon Valley, as discussed in detail in Chapter 7. They also provide a centralization function for obtaining resources necessary for entrepreneurship. There is some indication that these institutions act as intermediaries between entrepreneurship pioneers and society at large, and that once certain norms and roles are negotiated in the context of these institutions, separate, more specialized entities are established. These entities can include growing startups, seed and venture funds, additional co-working spaces, incubators, and research bodies. Thus, by the end of 2014, the iHub management had helped found a mobile technology incubator, mLab

East Africa (Hersman, 2013), a seed-stage fund and accelerator, managed in collaboration with California-based investors (see Lacy, 2012), and a research arm, iHub Research (Hersman, 2013), in addition to assisting individual startups establish an independent presence in Kenya's market.

The developments observed in Kathmandu, Nairobi and London are not unique. There is widespread evidence of similar efforts to introduce the Silicon Valley as a model of entrepreneurship ecosystem development around the world. These include Silicon Cape in South Africa, Silicon Lagoon in Nigeria, Silicon Gulf in the Philippines, Silicon Goli in Bangladesh, Silicon Welly in New Zealand, Silicon Docks in Ireland, Wilicon Wadi in Israel, Silicon Allee and Silicon Saxony in Germany, Dubai Silicon Oasis, Lima Valley in Peru, and Silicon Valley of the North, to mention just a few of over 90 such documented regions (see Appendix A for a more extensive list). In addition, there are smaller public and private initiatives, such as Vietnam Silicon Valley, a program for Vietnamese startups managed by the country's government (Ministry of Science & Technology, 2014), and Silicon Valley Comes to the UK, a non-profit organization founded by Silicon Valley entrepreneurs and investors that allows interaction between US and UK tech hubs startups, investors and mentors (see Silicon Valley Comes to the UK, 2014). It is possible that many more efforts to mimic the Silicon Valley model exist around the world without explicit reference to California's famous entrepreneurship ecosystem. A number of popular sources have gathered lists of tech hubs inspired by Silicon Valley, in Brno, Czech Republic; Cairo, Egypt; Kigali, Rwanda; Santiago, Chile; Shenzhen, China; Singapore, and others (see, for instance, a review of press coverage of tech hubs by Slate, 2013). Recipes for replicating Silicon

Valley have also been published by a variety of sources, from bloggers, such as the Ecuadorian entrepreneur Antonio Altamirano who founded the company Tangelo in Silicon Valley (see Altamirano, 2014), to consulting firms, like Accenture, who have compiled a series of publications aimed at assisting decision-makers in their pursuit of replicating the model (see, for example, the diagram in Appendix B, produced by Accenture Institute for High Performance, 2013).

Based on the above analysis, Figure 14 captures the proposed framework for the development of an entrepreneurship ecosystem in a new (or dynamic) industry.

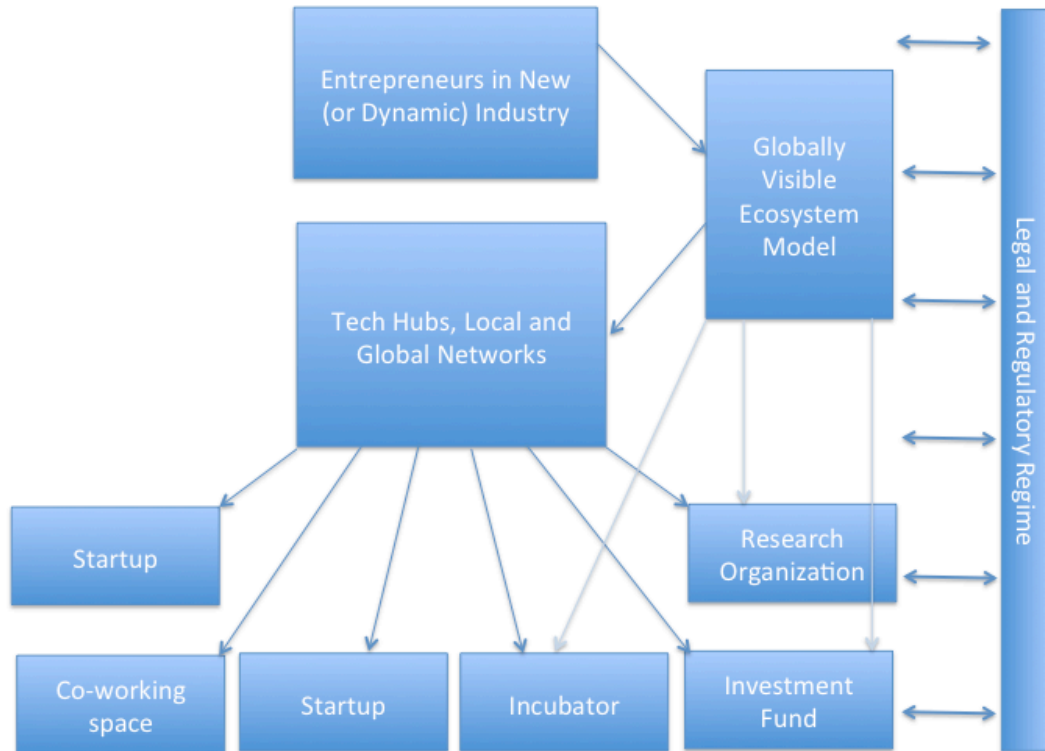


Figure 14: Towards a Global Framework of Entrepreneurship Ecosystem Development

The starting point for the framework consists of a group of the earliest entrepreneurs and other pioneering actors, who, motivated by learning goals and the quest to establish legitimacy for entrepreneurship in the new industry, look to a globally visible ecosystem model for inspiration. These entrepreneurs and other promoters of the chosen model engage in informal networking activities, while learning about and adapting components of the model to the local environment, through processes of storytelling and mimesis. Such activity gives rise to new institutions like tech hubs and formalized networking organizations. The purpose of these institutions is to support the development of an entrepreneurship ecosystem, by providing a centralizing function in the entrepreneurs' quest for resources, including the quest for legitimacy for

entrepreneurship as an economic activity in society at large. The new institutions allow entrepreneurs to also successfully “incubate” other, more specialized institutions (funds, research bodies, startups, etc.). Over time, these new institutions (e.g. tech hubs and formalized networks) give rise to more specialized and more numerous institutions, many of which are also inspired by components of the globally visible ecosystem. (As mentioned above, Nairobi’s iHub founders have assisted with the founding of more specialized institutions including a mobile technology incubator , a seed-stage fund, and a research arm.) All of this occurs in a particular legal and regulatory context, which is influenced by and influences the newly forming institutions and thus the ecosystem as a whole. Other feedback loops and connections between the institutions form and strengthen as the ecosystem matures.

Over time, the new ecosystems converge in terms of structure and function, establishing the globally visible model as a de facto global standard for the development of an entrepreneurship ecosystem. As DiMaggio and Powell (1983) warn, the mere occurrence of such institutional isomorphism does not necessarily result in increased efficiency or other improvements of alternate paths. Instead, it seems inevitable that the space for institutional innovation is reduced by the process.

8.6. Assumptions and Limitations of the Framework

An important assumption has been made in the proposed framework: that circumstances in a variety of locations around the world, in addition to Kathmandu, Nairobi and London, meet the conditions set out above (in section 8.5), based on the work of DiMaggio and Powell (1983) and Djelic (2001). Some evidence of a global

phenomenon of mimetic processes aimed at modeling ecosystems after California's is cited earlier in this chapter and in appendices A and B, and consists primarily of the existence of numerous environments whose nomenclature incorporates explicit references to Silicon Valley, along with the presence of "recipes," developed by consulting firms and other advisory institutions, for understanding or replicating the Bay Area model; however, the framework would benefit greatly from additional, detailed, empirical studies of other ecosystems, which are beyond the scope of this thesis.

A second assumption inherent in the framework stems from the lack of an alternative, yet equally globally-visible and desirable model of entrepreneurship ecosystem development. As noted above in Section 8.3, a number of models other than Silicon Valley, in particular those of Israel, Taiwan, Finland, or the Boston area, are familiar to researchers and practitioners of entrepreneurship in high tech industries, but they are less-well known among societies at large, and thus less useful as sources of reference points that signal legitimacy. This lack of alternate globally-visible models makes it difficult to identify, let alone consider competing explanations for the isomorphic processes found to be occurring in Kathmandu, Nairobi and London. In-depth examinations of other possible factors driving these processes would help to refine and strengthen the framework proposed.

Lastly, the lack of a detailed consideration of feedback loops between the various components of an ecosystem limits the level of analysis at which the framework can be applied. The absence of a comprehensive examination of feedback loops is not accidental, but rather a result of the necessarily limited scope of the study and of the

methodological choice, for which justification is provided in Chapter 3. Additional investigation, for instance of communication patterns among ecosystem actors, using social network analysis or other quantitative methods, could help to refine the framework as it relates to patterns of activity and influence among individuals.

8.7. Chapter Summary

The previous, seventh chapter established the tendency of the entrepreneurship ecosystems in Kathmandu, Nairobi and London toward convergence, by presenting evidence of institutional modeling inspired and informed by the Silicon Valley experience. While the literature review revealed a number of related theoretical and empirical studies, in light of the results, this chapter focuses on the well-known theory of institutional isomorphism, developed by DiMaggio and Powell in 1983, and also integrates the works of Wiewel and Hunter (1985) on legitimacy-building by association through networks, and Djelic (2001) on the process of cross-national transfer, or export, of a particular economic model, in order to present a theoretical framework that could be directly applied to the analysis of entrepreneurship ecosystem convergence, occurring from lesser to greater extents around the world. The combination of these approaches, informed by the findings from this study and evidence of the existence of a large number of other ecosystems influenced by the Silicon Valley model, results in the proposed framework visually depicted in Figure 14. The framework places tech hubs and networking organizations at the centre of the process of translating a globally visible model of an entrepreneurship ecosystem to a local environment. These new institutions allow entrepreneurs and other ecosystem pioneers

to benefit from a supportive community as they engage in story telling and mimetic behaviour in order to increase legitimacy for high technology entrepreneurship as an economic choice, and increase the availability of other resources necessary for their individual ventures. The framework acknowledges the influence of policy and regulation on the development of an entrepreneurship ecosystem, as well as the reverse effect of the developing ecosystem on policy and regulation. While the framework will, hopefully, be useful to other researchers analyzing entrepreneurship ecosystems around the world, it is important to note that it is not meant to be used as a tool for any normative endeavors. On the contrary, the finding of applicability of the framework to many entrepreneurship ecosystems in very diverse contexts could be interpreted as a sign of widespread constraints to institutional, if not also product and service, innovation in the high technology industries. In the cases studied here, mobile entrepreneurs have demonstrated that, to them, institutional change is a necessary component of development and growth.

The type of isomorphism found here can be termed “aspirational,” since it is found to occur in the context of pursuing a specific outcome perceived to have been previously achieved by the application of a particular institutional model. The difference between “aspirational isomorphism” and behaviours described by DiMaggio and Powell lies in the interpretation and adaptation of an established institutional model that can then be embedded in the nascent institutional environment (in this case, an entrepreneurial ecosystem). Rather than pure mimesis, aspirational isomorphism is a flexible and creative endeavor.

9. Recommendations and Conclusion

Based on the findings of the three case studies and reviews of academic and practitioner literature, this chapter makes a number of recommendations for further research and policy development, before briefly summarizing this thesis as a whole.

9.1 Recommendations for Further Research

The comparative nature and the diversity of ecosystems selected for this study has not been the norm in entrepreneurship research. In a review of scholarly works on institutional entrepreneurship Bruton et al. (2010) note that most empirical studies have been focused on single countries or regions, including on China, the West Bank, and Bangladesh. They find the lack of comparisons between countries or regions to be a detriment to further development of institutional entrepreneurship theory, when compared to comparative studies. Bruton et al. (2010) cite two studies as exceptions: one by Zacharakis et al. (2007), with a focus on the way venture capital investment decisions are made in the US, South Korea and China, and another by Manolova et al. (2008), where the institutional environments in Bulgaria, Hungary and Latvia are found to be largely unsupportive of entrepreneurship. Bruton et al. (2010) conclude that more multi-region, or multi-country studies would help strengthen institutional entrepreneurship theory and increase its relevance in a variety of contexts.

Battilana et al. (2009) also state that additional comparative studies are needed if the field of institutional entrepreneurship is to “move beyond idiosyncratic research” (p.

95). As exceptions, they cite Boxenbaum and Daudigeos' study of institutional variables in the process of market creation in post-World War Two Denmark and France (2008) and Rothenberg's study of management practices in two Chrysler manufacturing plants in St. Louis, USA and Windsor, Canada (2007).¹⁸ They specifically suggest qualitative comparative analysis as a tool that could help to explore how institutional entrepreneurs emerge, engage in changing the institutions in their environments and the larger effects their actions might have on diffusion of institutional models (Batillana et al., 2009). The comparison of the Nairobi, Kathmandu and London mobile technology ecosystems is a contribution to such an effort; however, given the inevitable limitations of time and scope, this study leaves a number of interesting questions unanswered. One such question that arises from the findings is whether the adoption of existing models of entrepreneurship ecosystem development, such as the one offered by the Bay Area, impedes the generation of local institutions that vary in structure and function and from one another, and if so, whether it thereby reduces the capacity for local innovation. Moreover, studies of other ecosystems at various stages of development would help to verify the theoretical proposition made above. These could focus on additional entrepreneurial networks that are explicitly, or even implicitly, looking to Silicon Valley as a source of institutional ideas; alternatively, investigations could be made into entrepreneurship ecosystems that have developed in relative isolation from other, well-known examples. Both types of studies would improve our understanding of entrepreneurship ecosystem building practices and help to refine the model proposed above. Further, as Granovetter and McGuire (1998) and

¹⁸ They also give the example of Lawrence et al. (2002); however, this is a longitudinal study of collaborative actions of a single non-governmental health organization operating in Palestine.

Forbes and Kirsch (2011) suggest, historical studies that identify alternate paths that existed but were not chosen in a given context, could provide a more holistic view for entrepreneurship researchers and prevent them from concluding that a particular established ecosystem model was the result of inevitable responses to a specific technology or the specific environment from which it emerged. Finally, given the consistencies in terminology found across the three communities, it would be interesting to emulate the study of keywords by Ghaziani and Ventresca (2005), to test whether terms such as “tech hub,” “meetup,” “venture capital,” and so on are understood in similar ways globally, and if so, whether the consistencies in meaning can be associated with the emergence of local entrepreneurship ecosystems. It would also be useful to investigate if other, indigenous terminology is giving way to a new, imported one, and if so, what the implications of such displacement could be for the innovation potential of an ecosystem.

9.2. Policy Goals

As has been discussed at length in the preceding sections and the introductory chapters of this thesis, there is a great demand among policy-makers for sound advice on encouraging innovation and entrepreneurship in the mobile and other high technology industries; there is also no lack of available advice, although much of it is inspired by empirical studies describing individual successful cases of innovative regions in industrialized countries, such as the San Francisco Bay Area in the US and Baden-Württemberg in Germany. As a result, many policy makers have attempted to create new science parks, technopoles and support structures in their liking, with mixed

success (Breschi & Malerba, 2001). This study has taken a different approach, by examining and comparing three different mobile technology entrepreneurship ecosystems. The resulting findings can be used to derive the following broad policy goals:

1. *Reduce constraints related to social pressures, uncertainty, and basic infrastructure to maximize entrepreneurial potential.* This study has found that actors engaged in building an entrepreneurship ecosystem engage in mimetic behaviours leading to institutional isomorphism, which, although useful in many ways, have the potential to constrain future opportunity for innovation. Such mimetic behaviours are a type of response to local constraints. Two major types of local constraints include social pressure and uncertainty. Social pressure can be exerted, for instance, by families of talented and skilled would-be entrepreneurs who would prefer these individuals to choose more traditional career paths, or by society-at-large which has come to hold certain types of economic choices, such as taking a government or banking industry job, in higher regard than others. By referencing better-known and perceived-to-be superior models of entrepreneurship action, such as Silicon Valley, entrepreneurs seek to legitimize their choices and win support of their environments. As an alternative remedy, entrepreneurs could be given support through public recognition, provision of critical resources, inclusion on policy consultations, and so on. Uncertainty, on the other hand, is inherent in dynamic industries such as the mobile industry, with frequent appearances of new,

disruptive technologies that simultaneously create opportunities for entrepreneurship but make choices for pursuing those opportunities difficult to evaluate. By pursuing successful models of ecosystem development and following what seem to be proven strategies, local entrepreneurs seek to reduce various types of uncertainty. Policy instruments that cushion the possible (or even probable) negative outcomes of risk-taking may be useful in pre-empting mimetic behaviour, although they should be designed carefully, so as not to disrupt competitive markets. A third type of constraint may not necessarily lead to mimetic behaviours, but is no less disruptive to entrepreneurship: lack of basic infrastructure. In the case of mobile technology entrepreneurs in Kathmandu, Nairobi, and London, a lack of widely available, reliable and affordable internet connectivity, affordable local transit, and appropriate office space (including all-hours access and non-stop electricity) were named as infrastructure-related barriers that informed policy makers could help to remove.

2. *Support “sandbox” initiatives that will allow entrepreneurs and other ecosystem actors to learn about and experiment with various types of ecosystem development initiatives, including original ones and those inspired by existing models.* One of the strongest motivations of entrepreneurs for networking with others in their ecosystem found in this study was to learn from them. Since the most prominent model of a successful ecosystem is that of Silicon Valley, and since information about it is easily accessible, much of the learning occurring was focused on that particular model. While some methodologies (for example, the networking approach employed by Mobile Monday, which originated in

Finland) have gained popularity elsewhere, numerous other successful examples exist have not; for instance, Stockholm is the second most prolific technology hub globally, measured in terms of startup valuation per capita, and yet Sweden is studied much more rarely than other environments as a model for entrepreneurship development¹⁹.

3. *Provide incentives and minimize risks for existing industries or other sources of local competitive advantage to dedicate resources to contributing to an emerging technology entrepreneurship ecosystem.* For instance, the financial industry in the UK, the agriculture industry and the mobile money sector in Kenya, and the tourist industry in Nepal, may be able to improve efficiency and gain other benefits from integrating innovative mobile technologies into their sector; yet, without policy initiatives, such industries can be seen as a barrier to entrepreneurship (as is the case with Britain's financial industry, widely seen to absorb much of the country's skilled labour). Other approaches could focus on specialization in a particular stage of production (see, for instance Breznitz, 2011).
4. *Invest in technology skills development and ensure mobility of skilled labour.* A shortage of skilled labour was cited as one of the most important barriers to entrepreneurs in all three cities, and there is reason to believe that this is a global phenomenon, affecting even the Bay Area itself. For instance, a popular American accelerator program, Tech Stars, which provides seed investment and mentors to the most promising startups, has given rise to another institution,

¹⁹ On a per capita basis, Stockholm is the second most prolific tech hub globally, with 6.3 billion-dollar companies per million people (compared to the Valley with 6.9). See Tung, 2014.

Startup Institute, focused solely on providing trained talent to the startups graduating from Tech Stars programs. It is important to note that increasing the number of graduates from technical colleges may not be enough to supply the right kind of labour for innovative startups recent. A recent US study has found that there are more graduates from science, technology and engineering and math programs than there are jobs (see Teitelbaum, 2014); yet, this finding does not negate the sentiments expressed by leading US technology firms about their difficulties to find the “right” talent (see Kaplan et al., 2012; Kuranda, 2013). In addition to increasing opportunities for local skills development and training—both in technical subjects and entrepreneurship, policies that allow entrepreneurs to hire employees from other countries and regions can help to ensure that local startups with growth potential have access to the best labour resources from around the world.

5. *Retain (some) flexibility.* Given the dynamic nature of technology-intensive, innovative industries, it is important for all ecosystem actors to retain the ability to change their choices and keep a wide number of options open as they pursue new opportunities. While the emergence of dominant institutional models may be inevitable, networks and social movements can create the space for their corrections or replacement by alternatives (see Lounsbury et al., 2003, for a discussion of the recycling industry’s emergence as an example of new institutional development amidst existing socio-economic practices). In the effort to retain institutional flexibility, traditional institutions with deeply rooted bureaucratic procedures, such as governments or large corporations, may not be

well suited to lead the practical aspects of the development of an entrepreneurship ecosystem (see Breschi & Malerba, 2001, for a discussion of disadvantages of government-led, top-down approaches in entrepreneurship cluster development); however, governments can and should be active participants in ecosystem development, especially in terms of provision of basic infrastructure. In addition, governments can be a source of demand for new products and services and can benefit directly from innovations brought about by entrepreneurs.

The above policy goals have been derived from empirical findings and theoretical foundations laid out in this study. Their overall aim is to find a balance between reducing constraints and uncertainty inherent in a new or dynamic industry such as the high tech industry, and increasing the supply of critical resources and opportunities entrepreneurs need in order to create innovative ventures. The emphasis is on retaining flexibility while minimizing risk, an equilibrium that is notoriously difficult to strike in policy-making related to innovation. The hope is that the study's findings and analysis will increase policy makers' understanding of the entrepreneurial journey, and help them articulate their own goals to guide policy-making in their specific geographic, social and economic context.

9.3. Conclusion

This study has not followed the usual pattern of studying cases from low-income countries separately from those in high-income, industrialized economies. This has proven beneficial because it has shown certain common trends and thus indicated

directions in which further research of this quickly expanding field may be conducted, regardless of the socioeconomic and other conditions of individual ecosystems. In particular, a general trend, common to all three entrepreneurship ecosystems studied, was found toward increased institutionalization of entrepreneurial activity across the three case studies, and this trend was focused on the specific process of imitating and referencing the model of Silicon Valley. In that context, the three cases could be visualized on a continuum according to the degree to which they included institutional components inspired by Silicon Valley. This finding largely supports DiMaggio and Powell's (1983) theory of institutional isomorphism, and their hypotheses regarding mimetic processes through which this occurs. The interesting question is why such a process is happening, especially in light of DiMaggio and Powell's finding that increased homogenization within a field does not lead to increased efficiency nor necessarily to any other benefits. In the three cases of Kathmandu, Nairobi and London, entrepreneurs were found to be engaging in mimesis in their pursuit of legitimacy for their ventures and of entrepreneurial action more generally, as a response to environmental constraints. They were also found to be adopting components of the Silicon Valley model in their pursuit of acquiring new skills and knowledge, that is, learning. In addition, the tendency to model their activities after the example of Silicon Valley was found to be driven by a shared desire to contribute to a self-renewing ecosystem where successful entrepreneurs, local and international investors, and society at large, and to continue to support risk-taking done in pursuit of creation of new ventures. Whether the Bay Area is indeed such an ecosystem, and whether it can be

successfully copied, or modeled, is a question that could be addressed through analysis of these and other ecosystems as they develop over time.

The motivations for networking reported by entrepreneurs from Kathmandu, Nairobi and London varied more in terms of degree, than in substance, with cultural risk-aversion by key actors in their environments, and a labour shortage identified as sources of barriers to startup growth in all three cases. The respondents clearly valued and carefully nurtured their social connections, conscious of the fact that their personal networks were useful not only for growing their new ventures but also for building institutions and developing local markets. On a closely related note, perceived risks of networking were generally ranked as low, or at least manageable.

The entrepreneurs themselves came across as globally connected, well-organized and driven by clear goals, whether they were located in Nepal, Kenya, or the UK. They were eager adopters of foreign startup terminology and management practices, again inspired by Silicon Valley examples, and did not, for the most part, express concern or consideration of whether such an approach was the optimum choice for their local environments. The exception to this came from a small number of London informants, who questioned the wisdom of comparing London's entrepreneurship ecosystem to others, and especially to that of Silicon Valley. Learning from successful examples can be undeniably valuable; however, given the lack of evidence that institutional isomorphism leads to greater efficiency or other benefits, it would be prudent for entrepreneurs, policy-makers and other actors influencing the evolution of entrepreneurship ecosystems to retain sufficient flexibility within their models to take advantage of the unique potential of their environments.

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Appendix A: List of Entrepreneurship Ecosystems with Explicit Reference to Silicon Valley

Sources: Wikipedia, 2014; personal conversation.

Africa

1. Silicon Cape — Cape Town, South Africa
2. Silicon Lagoon — Lagos, Nigeria
3. Silicon Savannah — Nairobi, Kenya

Asia

4. Bit Valley — Shibuya, Tokyo, Japan (a pun on Shibuya's literal translation of "Bitter Valley")
5. Silicon Peninsula — Dalian, China
6. Silicon Gulf — Davao City, Philippines
7. Silicon Valley of China — Zhongguancun, Haidian District, Beijing, People's Republic of China (PRC)
8. Silicon Valley of India (sometimes referred to as Silicon Plateau) — Bangalor
9. Silicon Valley of South Korea — New Songdo City, Incheon
10. Silicon Valley of Indonesia — Bandung, Indonesia
11. Silicon Valley of Taiwan — Hsinchu, Taiwan
12. Silicon Goli — Dhaka, Bangladesh

Australasia

13. Silicon Mallee — Adelaide, Australia (Mallee, an Australian aboriginal word for the land area around Adelaide covered by low, scrubby dwarf eucalyptus 'mallee' vegetation)
14. Silicon Welly — Wellington in New Zealand
15. Silicon St, Sydney An inner city colloquial district including Ultimo/Pymont along Harris St spanning 10sqkms from UTS to Google including Fishburners
16. Europe
17. SiliconFjord - Oslofjord-region
18. Health Valley — The Netherlands
19. Food Valley — The Netherlands
20. Etna Valley – Catania, Italy
21. Russian Silicon Valley:
 - a. Skolkovo innovation center
 - b. Zelenograd, Moscow
22. Silicon Docks — Dublin, Ireland
23. Silicon Sentier — Paris, France
24. Silicon Sloboda — Moscow, Russia
25. Silicon Taiga — Akademgorodok, Russia
26. Ticino Valley - Switzerland, technology cluster in the Lugano Area
27. Silicon Wadi – Haifa, Tel Aviv, Israel

Germany

28. BioCon Valley - Mecklenburg and Western Pomerania
29. CFK Valley – Stade, Lower Saxony
30. Isar Valley - Munich, Bavaria
31. IT-Cluster Rhine-Main-Neckar / IT Valley - Rhine-Main-Neckar region
32. Measurement Valley – Göttingen, Lower Saxony
33. Medical Valley – Erlangen region, Bavaria
34. Silicon Allee (English: Silicon Avenue) — Berlin (incl. WISTA)
35. Silicon Saxony — Dresden, Saxony, Elbe river valley around the city
36. Silicon Woods – Kaiserslautern, Rhineland-Palatinate
37. Solar Valley – Thalheim, Saxony-Anhalt

United Kingdom

38. Cwm Silicon — Newport, Wales
39. Silicon Canal — Birmingham, England — the area along the Digbeth Branch Canal from Aston Science Park, through Millennium Point to Digbeth.
40. Silicon Corridor — the M4 corridor
41. Silicon Dock — Belfast
42. Silicon Fen — Cambridge, England
43. Silicon Glen — Central Belt, Scotland
44. Silicon Walk — Edinburgh, Scotland
45. Silicon Gorge — Bristol, England
46. Silicon Alley — Pink Lane, Newcastle Upon Tyne, England
47. Silicon Mall — London, England — the area between Pall Mall and Victoria in London
48. Silicon Mill — Manchester and North West England
49. Silicon Roundabout — the area around Old Street Roundabout in London
50. Silicon Pier — Brighton, England
51. Silicon Shipyard — Newcastle upon Tyne, Gateshead, Middlesbrough
52. Silicon Spa — Leamington Spa, Warwickshire
53. Silicon Forest — Newark, Nottinghamshire — Silicon Forest consists of various businesses from in and around the Newark and Sherwood area that specialise in technology and innovation.

Middle East

54. Dubai Silicon Oasis — Dubai, United Arab Emirates
55. Silicon Wadi — The coastal plain of Israel, stretching from Haifa to Tel Aviv and Rehovot and expanding inland to Jerusalem

South America

56. Brazilian Silicon Valley — Campinas, Brazil
57. Lima Valley — Lima, Peru

North America

58. Silicon Valley of the North - Ontario Highway 401 between Toronto and Waterloo

59. Silicon Valley North — Ottawa, Canada, though questionable since the 2009 bankruptcy of Nortel and the 2008 pull-out of Dell's call centre
60. Silicon Vineyard — Okanagan Valley, Canada
61. Mexican Silicon Valley/Silicon Valley South — Jalisco, Mexico
62. Silicon Border — Mexicali, Mexico

63. United States
64. Silicon Alley — A portion of Lower Manhattan in New York City, more specifically Broadway, the Flatiron District, TriBeCa and SoHo
65. Silicon Anchor — Norfolk, Va–Virginia Beach metropolitan area
66. Silicon Bayou — New Orleans, Louisiana
67. Silicon Beach — Santa Monica, California and the Westside area of the Los Angeles metro, more specifically Culver City, Venice Beach, Westwood, Manhattan Beach, Malibu, Playa del Rey, and Marina del Rey
68. Silicon Bridge — DUMBO, Brooklyn, New York
69. Silicon Canal — Seattle, Washington
70. Silicon Coast — Orange County, California
71. Silicon Desert — Chandler, Arizona
72. Silicon Forest — Portland, Oregon
73. Silicon Harbor — Charleston, South Carolina
74. Silicon Hill — Washington, DC
75. Silicon Hills — Austin, Texas
76. Silicon Mountain — Front Range Urban Corridor, Colorado (Denver, Boulder, Fort Collins, Colorado Springs)
77. Silicon Prairie
78. Dallas-Fort Worth Silicon Prairie — Dallas-Fort Worth Metroplex, Texas
79. Illinois Silicon Prairie — Chicago and Urbana-Champaign
80. Midwest Silicon Prairie — Omaha, Des Moines, Kansas City
81. Wyoming Silicon Prairie, also called the "Silicon Range" — Jackson Hole
82. Silicon Sandbar — Cape Cod, Massachusetts[citation needed]
83. Silicon Shire — Eugene, Oregon
84. Silicon Shore — Santa Barbara, California
85. Silicon Slopes — Utah, concentrated in the Wasatch Front
86. Silicon Snowfield — Rochester, New York
87. Silicon Surf — Santa Cruz, California
88. Silicon Swamp — Gainesville, Florida southwest toward Tampa, headquarters of Grooveshark and many other technology companies.
89. Silicon Valley — San Jose, California (the original "Silicon" namesake)
90. Philicon Valley — Area close to Philadelphia, in the suburbs of Valley Forge and Wayne, also known as "Silicon Valley Forge"[6]
91. Cyber District — Area of Boston between Summer and Congress Streets, near Fort Point Channel, has organized itself as the "CyberDistrict"
92. Silicotton Valley — Huntsville, Alabama

Other references to Silicon Valley:

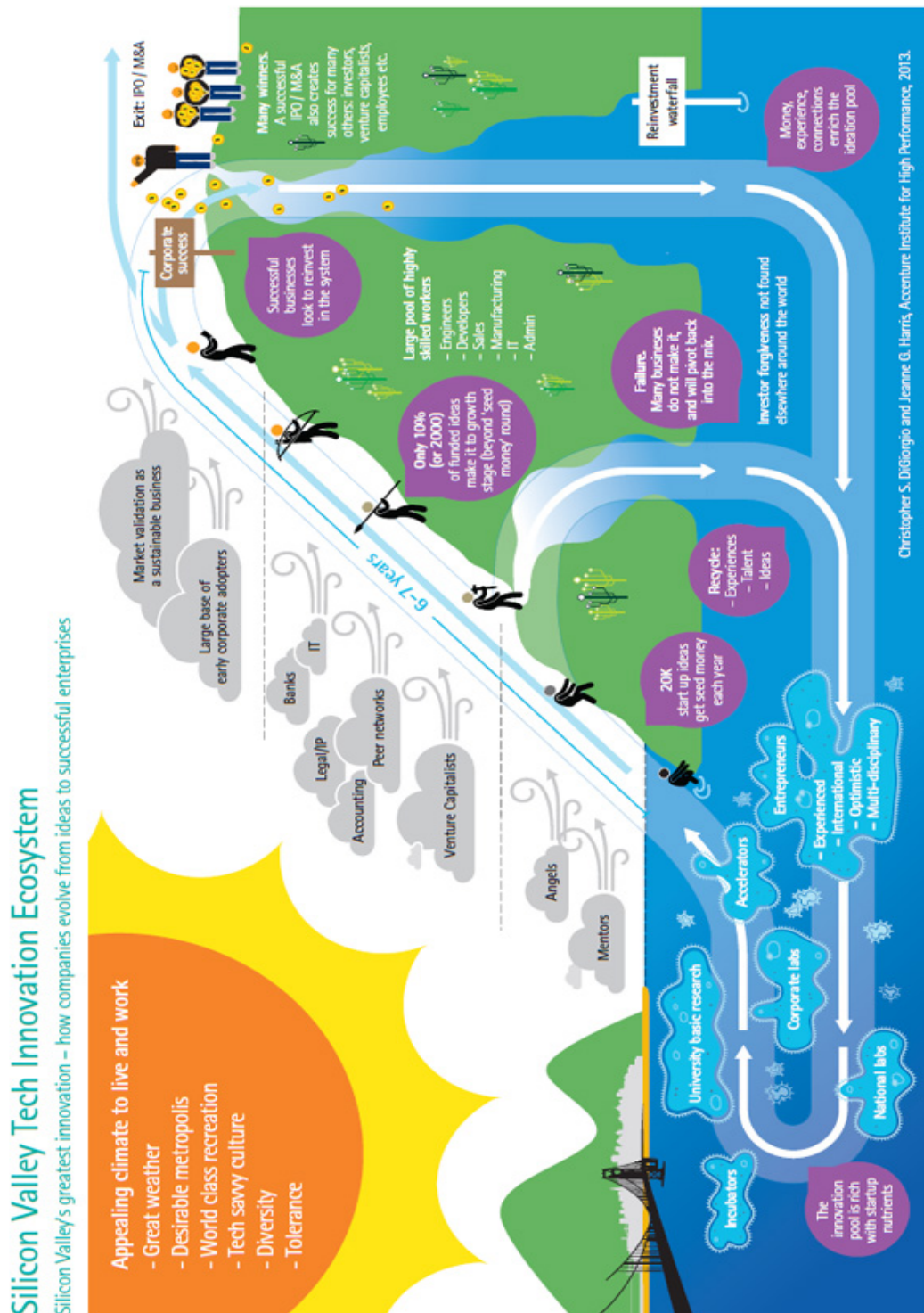
Vietnam Silicon Valley: a Vietnamese government-supported program for startups.
<http://www.siliconvalley.com.vn>

German International School of Silicon Valley: a private school in California which enables student exchanges between Germany and other countries, and which aims to promote “imaginative and creative thinking” (GISSW Website, 2014).
<http://www.gissv.org/>

Silicon Valley Comes to the UK: a nonprofit organization founded by Silicon Valley entrepreneurs that allows interaction between US and UK startups, investors and mentors.
<http://www.svc2uk.com>

Appendix B. Diagram of the Silicon Valley Model

Source: Accenture Institute for High Performance, 2013



Appendix C: Profiles of Focus Group Participants

In Kathmandu, focus group participants included the following:

- 1) Developer, Software development firm #1
- 2) Developer, Software development firm #1
- 3) Developer, Software development firm #1
- 4) Developer, Software development firm #1
- 5) Coordinator, Student IT Club
- 6) Employee, Software development firm #2
- 7) Employee, Software development firm #2
- 8) Manager, Employee, Software development firm #2
- 9) Developer, IT service provider
- 10) Developer, US-based software firm
- 11) Developer, US-based software firm
- 12) Employee, Software development firm #3
- 13) Developer, Multinational software development firm
- 14) Developer, Multinational software development firm
- 15) Representative, Business software development firm
- 16) Freelance mobile developer
- 17) Founder, Startup focused on education app
- 18) Co-founder, Web, software and multimedia startup
- 19) Co-founder, Web, software and multimedia startup

In Nairobi, the focus group participants included the following:

- 1) Convenor, Non-profit organization offering programming training, Nairobi
- 2) Entrepreneur, Entertainment and social media mobile app startup
- 3) Entrepreneur, Cloud based accounting mobile app
- 4) Entrepreneur, Traffic/geolocation mobile app startup
- 5) Entrepreneur, Health mobile app startup
- 6) Entrepreneur, Agriculture mobile app startup
- 7) Freelance developer, iOS and Symbian
- 8) Freelance developer, Symbian
- 9) Freelance developer, Java and Symbian
- 10) Administrator of a regional public fund focused on technology startups
- 11) Director of Information Technology for a major operator
- 12) Director of Mobile Banking and Payments Innovation at a major Kenyan bank
- 13) Director, Communications Commission of Kenya
- 14) Sales manager, Mobile device manufacturing firm #1
- 15) Sales manager, Mobile device manufacturing firm #2
- 16) Sales manager, Mobile device retail shop #1

- 17) Retail proprietor, Mobile device retail shop #2
- 18) Developer-relations associate, Mobile device manufacturing firm #1

In London, focus group participants included the following:

- 1) Manager, Mobile marketing company
- 2) Co-Founder, Mobile app focused on managing audio files
- 3) Developer team lead for Europe, Middle East and Africa, Mobile device manufacturing company
- 4) Information architect, Interaction designer and user researcher, Semiconductor manufacturing company
- 5) Founder, Mobile app startup focused on mobile games
- 6) Developer, Mobile app startup focused on the public transit sector
- 7) Senior executive and entrepreneur, Company focused on producing mobile content on behalf of third parties
- 8) User Experience Designer, Company focused on producing mobile content on behalf of third parties
- 9) Developer, Company focused on producing mobile content on behalf of third parties
- 10) Director, Mobile app startup focused on products for the visually impaired and elderly
- 11) Freelance entrepreneur working on mobile-controlled robots
- 12) Founder, Mobile app startup focused on the education sector
- 13) Founder, Company focused on social media and mobile marketing for small businesses
- 14) Co-organizer, Mobile networking organization #1
- 15) Co-organizer, Mobile networking organization #1 Monday and Co-organizer, Mobile networking organization #2
- 16) Employee, Technology startup incubator
- 17) Instructor, Android User Group
- 18) Co-founder, Mobile health app startup
- 19) Freelance developer, Mobile and web software
- 20) Entrepreneur, Mobile games

Appendix D: List of Interview Respondents

Kathmandu:

1. Co-founder, Startup focused on education app #1
2. Co-founder, Startup focused on news app
3. Co-founder, Startup focused on mobile payments #1
4. Founder, Startup focused on mobile payments #2
5. Founder, Startup focused on mobile payments #3
6. Founder, Startup focused on calendar and agenda app
7. Founder, Startup focused on advertisements
8. Founder, Startup focused on tourism
9. Founder, Startup focused on education app #2
10. Co-founder, Startup focused on language app
11. Co-founder, startup focused on web and multimedia apps #1
12. Co-founder, startup focused on web and multimedia apps #2
13. Founder, Startup focused on games apps #1
14. Founder, Startup focused on games apps #2

Nairobi:

1. Founder, Startup focused on mobile payments #1
2. Founder, Startup focused on cloud-based accounting software
3. Co-founder, Startup focused on medical mobile apps
4. Co-founder, Startup focused on agricultural apps #1
5. Co-founder, Startup focused on education/test preparation apps
6. Co-founder, Startup focused on potato farming
7. Co-founder, Startup focused on the fishing industry
8. Founder, Startup focused on mobile university directories
9. Founder, Startup focused on apps for collecting customer feedback
10. Founder, Startup focused on mobile schedule and calendar apps
11. Founder, Startup focused on agricultural apps #2
12. Co-founder, Startup focused on security apps
13. Co-founder, Startup focused on mobile payments #2
14. Co-founder, Startup focused on mobile payments #3
15. Founder, Startup focused on mobile payments #4
16. Founder, Startup focused on mobile payments #5
17. Co-founder, Startup focused on food delivery apps
18. Co-founder, Startup focused on mobile internet content aggregation
19. Co-founder, Startup focused on a “lost and found” app
20. Co-founder, Startup focused on education apps
21. Co-founder, Startup focused on mobile health apps #2
22. Co-founder, Startup focused on mobile traffic apps #1
23. Co-founder, Startup focused on mobile traffic apps #2

London:

1. Co-founder, Startup focused on mobile health app
2. Founder, Startup focused on education app
3. Founder, Startup focused on social media and mobile marketing for small businesses
4. Co-Founder, Startup focused on app for managing audio files
5. Founder, Startup focused on games app #1
6. Co-founder, Startup focused on public transit app
7. Co-founder, Startup focused on enterprise marketing app
8. Co-founder, Startup focused on music distribution app
9. Co-founder, Startup focused on social media apps
10. Co-founder, Startup focused on media aggregation software for mobiles
11. Co-founder, Startup focused on games apps #2
12. Co-founder, Startup focused on social media and text-messaging apps

Appendix E: Interview Guide

The following questions were used as a guide and not as a rigid protocol.

Section I: Warm-up

1.1 Tell me about your mobile business. How did you start it and what have you accomplished?

(This question was used to confirm the respondent was an entrepreneur—as defined in this study—and that the business has produced at least one new app for which the idea originated in the company and whose development was not commissioned by anyone else.)

1.2 What kinds of resources did you need to accomplish this?

Section II: Sources of information, labour, finances and other resources sought by entrepreneurs during the innovation process

2.1 Where do entrepreneurs like you turn when you need to acquire new information for developing new mobile apps, for example a) technical knowledge, b) information on running a business or c) industry knowledge?

(This question was intended to help determine whether or not networks feature prominently as a source of new information, gathering information about other sources and whether other sources are reached via the informal network.)

Repeated for

2.2. Labour,

2.3 Finances, and

2.4 Other resources: What other resources do you need? How do you obtain them?

Section III: Reliance of mobile entrepreneurs on networks; risks and rewards of participation in informal networks perceived by entrepreneurs.

3.1 Do you participate in any networks in the mobile industry? (If necessary, respondents were prompted with examples of Mobile Monday, Google Technology User Groups, collegial gatherings.)

3.2 If so, are there any rewards of participation in informal network? If so, what are the three most important rewards? Can you think of examples when you or other mobile entrepreneurs benefited directly from participation?

3.3 Are there any risks of participation in these networks? If so, what are the three most significant risks? How do you manage such risks? Can you think of examples when you or other mobile entrepreneurs were affected by these risks?

Section IV: Evidence of institutional network members

4. Can you name any institutions or organizations that have been useful to you in terms of obtaining the necessary resources for your startup? If so, can you describe how they have been helpful?

COOL DOWN

5. Are there any other observations about the role of networks in your work that you would like to share?

6. Could you recommend other entrepreneurs like you for participation in this study?

7. For demographic purposes, could I ask your age?

Thank you very much for your time.

Appendix F: Participant Consent Form

**University of Oxford
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Networks of Mobile Software Developers as Open Innovation Systems**

Student Researcher: Maja Andjelkovic
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I am a doctoral student at the Oxford Internet Institute, University of Oxford, studying the relationship between informal, interpersonal networks and innovation in the mobile industry. The study will critically assess the expectation that informal networks contribute to innovation success. In doing so, it will consider the cases of informal networks of mobile developers in Kenya, Uganda and the UK, asking whether informal networks of innovation are emerging as a significant, if not decisive factor of success. It will also reflect on other, alternative explanations that may refine or substitute the theoretical options currently available.

During this study, you will be asked to answer some questions about your participation in informal social networks, as a mobile application developer. This interview was designed to be approximately a half hour in length, but please feel free to expand on the topic or talk about related ideas. If there are any questions you would rather not answer, please say so and we will stop the interview or move on to the next question, whichever you prefer.

All of the information collected in this interview will be stored securely and kept confidential, unless you give explicit permission to be quoted. Only I and the faculty supervisor mentioned above will have access to this information. After completion of this project, all data will be destroyed or stored in a secure location.

Participant's Agreement:

I am aware that my participation in this interview is voluntary. I understand the intent and purpose of this research. If, for any reason, at any time, I wish to stop the interview, I may do so without having to give an explanation. I have the right to review, comment on, and/or withdraw information prior to the submission of the document for consideration towards the degree of Doctor of Philosophy at the Oxford Internet Institute, University of Oxford. If I have any questions about this study, I am

free to contact the student researcher or the faculty adviser. I have been offered a copy of this consent form that I may keep for my own reference.

I have read the above form and, with the understanding that I can withdraw at any time and for whatever reason, I consent to participate in today's interview.

Participant's signature

Date