



The Silicon Valley – Singapore connection: The role of institutional gateways in establishing knowledge pipelines

Jack L. Harris, Max-Peter Menzel*

Alpen-Adria-Universität Klagenfurt, Universitätsstraße 65-67, 9020 Klagenfurt am Wörthersee, Austria

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ABSTRACT

The literature on clusters emphasizes the necessity to integrate external knowledge to maintain their viability. This task, however, is aggravated by institutional differences between clusters. The central question for accessing diverse knowledge then is how to mitigate institutional differences between clusters. We propose that “institutional gateways” between clusters circumvent institutional barriers. Institutional gateways provide a configuration that consists of institutions from both clusters. This hybrid institutional configuration helps to mitigate institutional and cognitive distances and provides an entry point for firms from one cluster into the other. As an example, we explore the ‘Block71SF’ open creative lab in San Francisco. Block71SF was set up by the Singapore government to facilitate the movement of firms between the Singapore and Silicon Valley software clusters.

1. Introduction

The literature on clusters emphasizes the necessity to permanently integrate new and external knowledge to maintain their diversity and viability (Martin and Sunley, 2006; Maskell and Malmberg, 2007; Menzel and Fornahl, 2010). Studies highlight three mechanisms by which external knowledge is integrated into a cluster. The first is via relations, for example, as the literature on global knowledge pipelines describes how firms access knowledge from other places and clusters (Bathelt et al., 2004; Graf, 2011). A second mechanism is labour mobility. This effect is most prominently described in Saxenian’s (2007) Argonauts story of how Taiwanese PhD students and engineers travelling between Taiwan and Silicon Valley contributed to the former becoming the world’s largest semi-conductor industry. A third mechanism is through the location of external firms in a cluster, as particularly described by the literature on global production networks (MacKinnon et al., 2019).

Many studies emphasize the role of ‘global knowledge pipelines’ (Bathelt et al., 2004), i.e. structured inter- and intra-firm links between different places that often form via the establishment of new branches (Bathelt and Li, 2020), via periodic gatherings of professionals at conventions or trade fairs (Maskell et al., 2006; Li, 2014), or via knowledge facilitators that connect actors from different places (Powell et al., 2005; Bathelt and Li, 2020). Yet, there are ‘frictions’ (Bathelt et al., 2018) in establishing knowledge pipelines between places. Places have distinct

capabilities (Maskell and Malmberg, 1999), institutional configurations (Harris, 2021a), and relational assets (Zukauskaitė et al., 2017). These qualities make relations within places easy, but relations between places difficult.

However, different places are likely to engender different knowledge, making it particularly valuable, while knowledge in similar places is likely to be more homogenous and less valuable. The goal, then, should not be to simply integrate external knowledge, but to integrate external knowledge that is suitably different and bridges cognitive distances (Nooteboom, 2000), and thus there is significant value in navigating these institutional limitations between different places. The question stands, then, how can the differences between places and clusters be mitigated to enable the exchange of different knowledge between them?

We propose the concept of an ‘institutional gateway’, which fulfils important functions to circumvent these limitations. Institutional gateways are places like collaborative workspaces or open creative labs (Schmidt and Brinks, 2017) which are purposefully created by actors from one cluster in another cluster. These places provide a hybrid institutional configuration that consists of institutions from both clusters. This hybrid institutional configuration helps to mitigate institutional distance, encourage relations, and facilitate the integration of these firms into the host cluster. It also increases the opportunities for the creation of knowledge pipelines between the two clusters, and thus long-term knowledge transfer.

* Corresponding author.

E-mail addresses: jack.harris@aau.at (J.L. Harris), max-peter.menzel@aau.at (M.-P. Menzel).

As an example, we explore the 'Block71SF' open creative lab in San Francisco. Block71SF was set up by the Singapore government as an extension of Block71 in Singapore. It is open for both Silicon Valley and Singapore-based firms that usually stay there for several months to a year. Since its launch in 2015, over 100, predominantly Singaporean, startups have moved between the clusters, and many expansions, acquisitions, and partnerships have been made. Through this example, we derive the main pillars of an institutional gateway as: the setting of institutional hybridity in combination with temporary co-location, different possibilities for interaction, and support infrastructures, which enable actors to easily move between different institutional contexts in San Francisco and Singapore.

The following section investigates the relations between global knowledge pipelines, regional clusters, and diversity. The third section briefly describes the methodology before the fourth illustrates the Block71SF space and shows how it contributes to form connections between cognitive distant firms. The fifth section describes the institutional gateway concept and the sixth section concludes.

2. Cluster Diversity and Global Knowledge Pipelines

2.1. Regional Clusters and Diversity

The connection between diversity, space and growth was a significant contribution of Jacobs (1969). She argued for cities as a spatial context that allows combining different knowledge, both because cities comprise diverse knowledge but also the means to connect this diverse knowledge. These ideas also found their way into the cluster literature. Here, it is argued that diversity in clusters increases local learning processes that are difficult to copy over geographical distance (Menzel and Fornahl, 2010), and in doing so enhances dynamic firm capabilities (Teece et al., 1997). In addition, knowledge diversity makes a cluster less prone to shocks and downturns (Martin and Sunley, 2006) by facilitating adaptability (Boschma, 2017). Importantly, some economic geographers have taken an institutional perspective to diversity, arguing for institutional diversity as a key precondition for the viability of a regional cluster. For example, Grabher and Stark (1997) argued that a diversity of institutions both helped to transform the transition economies after the fall of the Berlin Wall and is responsible for the viability of the Italian industrial districts, while Hassink (2010) argued that a lack of institutional diversity is the main driver of cluster lock-in and decline.

Problematically, over time, the utilization of a cluster's diversity via learning leads to the depletion of that diversity as actors share their knowledge, which homogenizes their collective knowledge base (Menzel and Fornahl, 2010). Maskell and Malmberg (2007) argue that clustered firms are prone to 'myopia', i.e. the "routinized application of similar interpretative schemes and mutual understanding of new knowledge and technologies" (Maskell and Malmberg, 2007, p. 607). As a result, clusters develop particular institutional configurations that have deep-rooted histories and path dependencies (Harris, 2021a). Myopia is thus a key dynamic that leads to the differentiation of clusters, but it is also a key process in generating a negative regional lock-in.

To avoid negative lock-ins and to maintain diversity, a cluster depends on the permanent integration of new and diverse knowledge or institutions to maintain its viability (Martin and Sunley, 2006). This external knowledge often comes from other clusters (Bathelt et al., 2004). Yet, diversity between places makes it difficult for firms to tap into bodies of knowledge in other places. The place specific institutional configurations of clusters provide benefits to local firms (Cooke, 2001), but are a source of friction and barriers for external firms (Christopherson, 2007; Bathelt et al., 2018); the greater the difference in institutional contexts the greater the liability of being an outsider (Johanson and Vahlne, 2009). Therefore, to maintain cluster viability, it is not only important to integrate external knowledge, but that this external knowledge is suitably different to maintain cluster diversity (Menzel and Fornahl, 2010), while simultaneously not being too difficult to access

(Nooteboom, 2000).

2.2. Clusters and Knowledge Pipelines

The cluster literature emphasizes the importance of global knowledge pipelines to connect diverse clusters (Bathelt et al., 2004; Martin and Sunley, 2011; Lorenzen and Mudambi, 2013). For Bathelt et al. (2004), global pipelines are structured knowledge flows and formal links between firms that connect bodies of knowledge in different places through "strategic partnerships of inter-regional and international reach" (Bathelt et al., 2004, p. 40). Examples are R&D agreements, licensing deals, investment ties and marketing arrangements (Owen-Smith and Powell, 2004). Global pipelines can also be formed within firms, when firms with different subsidiary locations develop routines and practices to integrate this spatial dispersed knowledge into the intra-firm operations (Bathelt and Li, 2020).

Global pipelines have important locational spillover effects. Owen-Smith and Powell (2004) demonstrate using the Boston biotech industry how while some firms act as 'conduits' for highly structured global knowledge flows, this knowledge can then be exchanged via 'channels', i.e. connections between regional firms and local buzz, to spillover to other regional firms. Thus, global knowledge pipelines create positive local externalities (Bathelt et al., 2004).

However, the nature of such global knowledge pipelines can vary, and recent literature has gone beyond a dichotomy of local buzz and global pipelines. First, several studies have shown that global pipelines are constituted through complex social processes, often based on informal personal networks rather than solely formalized linkages. For example, Lorenzen and Mudambi (2013) distinguished between organization-based and person-based global linkages. Trippel et al. (2009) elaborated on the importance of personal relations, demonstrating that informal personal knowledge networks operate at all spatial scales, complemented by some formalized relationships. Similarly, Moodysson et al. (2008) found that the mechanisms for knowledge interactions in a Swedish life science cluster were globally configured inter-personal communities or inter-organizational alliances. Secondly, there is growing evidence that emphasizes the range of different international linkages in facilitating innovation. On the basis of a small sample, Trippel et al. (2009) suggest that more radical innovation is associated with a higher number of different types of sources of knowledge. This argument was substantiated by Fitjar and Rodríguez-Pose (2011), whose analysis of innovation in Norwegian city-regions demonstrated that firms involved in a greater diversity of international partnerships tend to be more innovative.

The literature further describes several mechanisms regarding the formation of global pipelines. Maskell et al. (2006) have emphasized the role of periodic gatherings of professionals for limited times in delimited spaces. These gatherings include trade fairs, conferences, conventions, or exhibitions. The main argument here is that these gatherings provide knowledge ecologies that are difficult to substitute by other forms of proximity, and thus can be best described as 'temporary clusters' (Maskell et al., 2006). In addition to being an immediate source of extra-local knowledge, temporary clusters help actors to form relations outside a locally embedded context (Li, 2014). There are also other mechanisms for the formation of global pipelines, such as via knowledge facilitators that provide services for large firms (Bathelt and Li, 2020), or how venture capital firms help early-stage technology-oriented firms with international networking (Powell et al., 2005).

2.3. Diversity and Optimal Cognitive Distance

Forming global pipelines usually causes frictions because they have to cover large cognitive distances (Bathelt et al., 2018). At the firm level, Nooteboom (2000) argues that successful collaboration between companies in global pipelines requires a so-called 'optimal cognitive distance'. That is, while too much cognitive distance can prevent

collaboration, too much similarity negates the benefits found in differences:

‘For learning, partners should have on the one hand sufficient ‘cognitive distance’, i.e. possess different cognitive categories, to be able to capture knowledge that one could not have captured oneself, but on the other hand must be sufficiently close, in cognition and language, to enable meaningful communication’ (Nooteboom, 2000, p. 14).

The optimal cognitive distance consists of two functions. One refers to communicability, as the mutual understanding of actors depending on the compatibility of how they interpret their environment, i.e. on their mutually shared mental models (Denzau and North, 1994). The other refers to the degree of novelty, which depends on the equivalency of the actors’ knowledge. The larger the differences in cognitive categories, the more radical the generated knowledge may be. Therefore, novelty increases and communicability decreases with cognitive distance and an optimal cognitive distance exists within a certain combination of communicability and novelty. Thus, everything else being equal, an increase in the degree of novelty requires an increase in communicability to capture that novelty.

Communicability depends on institutions “as forms of ongoing and relatively stable patterns of social practice based on mutual expectations that owe their existence to either purposeful constitution or unintentional emergence” (Bathelt and Glückler, 2014, p.346). Usually, this pertains to differences between organizations, as different corporate cultures can aggravate communication and prevent collaboration, even if this would be beneficial from an economic perspective (Lane and Lubatkin, 1998). Yet, these institutional effects on communicability can also apply to exchanges between places. Saxenian and Hsu’s (2001) show with the example of Silicon Valley-experienced entrepreneurs in Taiwan that clusters can integrate the institutions of other places within their own institutional configuration, which enhances communicability between these places and increases access to heterogenous knowledge.

Clusters have their own institutional configurations, as “combination [s] of shared goals, behaviours, and relations between cluster actors involved in a cluster” (Harris, 2021a, p.437). These have been formed in a path dependent manner, within particular contexts and broader institutional frameworks, creating a unique cluster institutional configuration that conditions and constrains behavior within the cluster. The question facing firms and policy makers alike is how can the institutional differences between clusters’ institutional configurations be intentionally mitigated to enhance communicability. This enhanced communicability can then facilitate the formation of knowledge pipelines between the knowledge bases of diverse clusters.

The literature emphasizes the role of ‘open creative labs’ in enhancing communicability between actors. Schmidt and Brinks (2017, p.292) “define open creative labs as permanent structures available to a wide range of users [...] on a temporary basis.” Examples are maker spaces, co-working spaces, and business accelerators. These open creative labs stimulate interactions (Capdevila, 2015), have been shown to be sources of diverse knowledge exchange (Bouncken and Aslam, 2019), and thus provide fertile learning grounds for firms (Wijngaarden et al., 2020). Therefore, open creative labs serve as hubs for communities (Schmidt and Brinks, 2017). These communities often comprise members from different countries. Particularly, business accelerators can be highly internationalized, bringing a cohort of startups together for learning new knowledge (Harris, 2021b).

In the following, we propose the concept of an institutional gateway as a means to reduce cognitive distance, using the example of Block71SF in San Francisco, an open creative lab providing a hybrid institutional configuration that consists of institutions from different places, mitigating institutional differences and enhancing communicability within the institutional gateway. In so doing, the institutional gateway facilitates the establishment of global knowledge pipelines between these clusters.

3. Methodology

This paper focuses on Block71SF in San Francisco and uses a *follow-the-path* methodology to understand its evolution (Pike et al., 2016). This methodology finds entry points into the evolutionary paths of phenomena, following them forwards to find out the effects that they caused, and backwards to find out the causal reasoning for their manifestation. Through this process other notable points were found, which were in turn followed forwards and backwards, until all avenues were exhausted and a comprehensive mapping of the evolutionary pathway had been performed. In this instance, to understand Block71SF as an extension of Block71 in Singapore and its software cluster, it also requires considering the evolution of the Singapore cluster.

Evolutionary and historical research can be difficult, particularly surrounding issues of data availability and verification (Henning, 2019) and so a mixed-methods methodology was utilised to offer ‘concurrent triangulation’ and the ability to corroborate findings (Creswell and Piano, 2018; Harris, 2021c). Table 1 provides an overview of the methods used in this study. Given that Block71SF represents only a part of the entire evolutionary pathway of the Singapore software cluster, not all of these sources provided information used in this paper, and interviews were the primary source of information. Of these 51 Singaporean interviews, 10 had direct relevance to Block71SF, as shown by the bracketed numbers in Table 2.

Respondents were asked about their experiences with either Block71 or Block71SF during semi-structured interviews that aimed to understand the reasoning behind the creation of these organisations and the effects that they had on firms within the Singapore software cluster. Questions were asked that aimed to elucidate the everyday environment of these places, the type of relations that existed either in these places or that formed because of time spent there, and the particularities of how these relationships were formed. Respondents were present at different times within this evolutionary trajectory and so offered us an overview of changes that have occurred at different stages, so that we could piece together a comprehensive understanding of the evolutionary trajectory of the Singapore software cluster and the particular role of Block71SF.

While understandings of the Singapore cluster and Block71 benefit from quite an extensive array of interviews, research into Block71SF specifically is limited by a relatively low interview count, which can be attributed to several reasons. Firstly, only approximately 100 startups have utilized Block71SF since its inception, so there is a limited pool of entrepreneur respondents to draw on. Furthermore, many of these startups have either been acquired or the founders have moved on to other projects, reducing the pool further. Secondly, Block71SF only has 2–3 staff at any given time, and so speaking to one of them who has been there since the beginning provided a sufficient level of detail. While a greater number of interviews would have been preferred, it is understandable given the context.

Table 1
Methods used in the research project.

| Method | Details |
|--------------------------------|--|
| Formal and informal interviews | Formal (31) |
| | Informal (20) With a range of actors such as firms, government organizations, community organizations and investors |
| Secondary data sources | Industry/government/firm reports Secondary interviews (20) |
| Blogs | Personal (firm) blogs |
| | News sources written as blogs Community group forums |

Source: Author’s own.

Table 2

Breakdown of primary interviews undertaken by actor type (some interviews are double counted as respondents fit multiple criteria, e.g. an entrepreneur and investor).

| Actor type | Software entrepreneurs | Accelerator and community actors | Investors | Government actors |
|-------------------|------------------------|----------------------------------|-----------|-------------------|
| No. of interviews | 35 (6) | 10 (2) | 9 (0) | 3 (2) |

Source: Author's own.

4. Establishing an Institutional Gateway between Singapore and Silicon Valley

4.1. Block71 San Francisco

Block71SF is a 6000sq ft office and events space located centrally in San Francisco. The office was previously occupied by Twitter before they needed to expand further. It is run by an organization of the same name which has a small team of 2–3 people who oversee the daily administration of the space and help to coordinate events. It also retains the support of NUS Enterprise (university entrepreneurship arm) and SingTel Innov8 (Telecom arm focused on entrepreneurship), in providing connections that startups can benefit from. There are usually around 20 firms in Block71SF at any one time, which have to go through an initial selection procedure to assess whether expansion into Silicon Valley is the optimal route for the startup and its product, technology, and market niches. Thus, not all Singaporean startups will necessarily benefit from utilizing Block71SF for entry into Silicon Valley.

The function of Block71SF is fairly unique. It fits to the broad definition of Schmidt and Brinks (2017) as an open creative lab because it combines a physical space with community building elements. Yet, it is difficult to classify Block71SF in a narrower category. It has elements of a coworking space in that it provides open-plan seating for people to come and go as they please, but its membership is restricted to those startups from Singapore or interesting in going to Singapore. It also has elements of an accelerator programme in that its purpose is to help select startups grow. However, it does not run a cohort system, fund them, nor does it coach the startups through a particular programme, instead simply providing them with the space necessary to ease their expansion.

4.2. The origins of Block71SF in Singapore

Block71SF has its origin in the Singapore software cluster. It was meant to support the Singapore software cluster and was created in a particular evolutionary phase of its parent cluster. Furthermore, it is a direct spin-off of the already existing place Block71 in Singapore, which also has offspring in China (Suzhou), Indonesia (Jakarta, Bandung, Yogyakarta), Vietnam (Saigon) and Japan (Nagoya).

Singapore has a lively software cluster with independent reports ranking it one of the best in the world (StartupBlink, 2021; StartupGenome, 2021), but it is a relatively recent cluster. The emergence phase of the Singapore software cluster can be traced to 2006 when the government, after seeing the success of Silicon Valley and Silicon Wadi, became interested in developing a Singaporean software cluster and subsequently launched a suite of policies that sought to promote entrepreneurial and investment activity around the software sector:

“[the resurgence in government interest] was around 2006... it was a slow start... around 2008 we spent a lot of money... then about 2010 things start to get interesting” (Government actor 1).

The policies were successful in funding and increasing isolated entrepreneurial activity in the software sector across Singapore, but did little to create the knowledge spillovers and networking externalities necessary for a cluster to emerge.

After this ‘slow start’, and building on a growing but spatially

disparate community of software startups, the critical breakthrough came in 2010 when the government repurposed ‘Block71’, a disused factory in the Ayer Rajah industrial estate, and allowed startups, investors, and accelerators to co-locate in the building at heavily discounted rents. Government agencies, in partnership with a local university organization called NUS (National University of Singapore) Enterprise, and the venture capital investment arm of a local corporate named SingTel Innov8, established the Block71 organization with the intention of the building becoming the centre of a burgeoning software cluster, as a coordinating hub concerned with bringing these spatially disparate actors together for mutual benefit. Through its supportive role, Block71 offered community spaces, hosted regular events, and supported all comers, to enable the aforementioned knowledge spillovers and networking externalities that are so critical for software clusters. As one representative of a government organization described it:

“Block71 became a place where if you are starting a company and need a cheap and convenient place then you get an office there. There was a concentration of startups, events were organized, and then accelerators realized this is where the startups are so we should relocate there, then VC’s, it became a hub” (Government actor 1).

Based on this early success the government then expanded, repurposing the neighbouring Block’s 73 and 79 to enable the co-location of even more startups, and naming the area [Launchpad.sg](#) to signify its purpose as a hub for startups to grow. By 2014, the [Launchpad.sg](#) area was considered a significant success, with Block71 as its flagship hub, and The Economist named it the ‘densest [software startup] ecosystem in the world’ (The Economist, 2014).

Singapore was viewed as one of the world’s leading software clusters for supporting early-stage startups at this time (StartupGenome, 2021), and according to the director of an accelerator located in Block71, “in the government’s mind, they believed that the very early-stage part [was] solved” (Accelerator director 1; for a comprehensive overview of the emergence phase, see Harris, 2021d).

However, concerns began to arise amongst government actors that despite the many early-stage startups located in the area, few had grown into the fast-growing startups known as ‘scaleups’, ‘unicorns’, or ‘gazelles’, and many struggling ‘zombie’ startups were present. A government actor stated “the government was disappointed [that] unicorns were far off and knew they had to do something” (Government actor 2). Three causal factors were suspected. Firstly, there was a lack of knowledge about how to scale-up an early-stage startup, primarily because of a lack of examples of successfully scaled up software startups in Singapore to learn from. Specifically, the knowledge on aspects like how to grow through hiring or expanding into foreign markets was missing. Secondly, this lack of knowledge on how to expand and grow rapidly was compounded by the size of the Singaporean domestic market that limited their ability to scale, with the city-state home to under 6 million people (Entrepreneur 1; Government actor 1). Thirdly, while the government provided seed capital, there was a lack of large venture capital firms that were willing to invest in these startups.

Consequently, one response the government sought to use was easing the difficulties for these startups in expanding into new markets and internationalizing, as well as facilitating the entry of more advanced extra-local startups into Singapore that may already have this knowledge (Government actor 2). Based on the success of Block71 in Singapore as a community-builder, in 2015 the government sought to utilize the brand and the model, launching a spinoff under the name ‘Block71SF’ in San Francisco, with the intention of facilitating the bidirectional movement of startups between Singapore and Silicon Valley (Entrepreneur 2). Just as Block71 has brought spatially disparate actors together in one community space in Singapore, so to would Block71SF bring Singaporean and Silicon Valley-based startups together in Silicon Valley, in an attempt to facilitate their expansion and movement between the clusters.

4.3. Block71SF in its Host Region

Choosing San Francisco was a relatively easy decision to make. Silicon Valley has historically been the leading software cluster in the world, with the largest proliferation of venture capital (Florida and Mellander, 2016), recognition as an international hub for immigrants working in technology sectors (Saxenian and Hsu, 2001) with over 60% of foreign born employees in tech occupations (siliconvalleyindicators.org, 2023), and home to one of the largest domestic markets in the world with many of the largest technology companies. This potential for market and venture capital access, along with an abundance of knowledge from larger firms, made Silicon Valley the ideal destination for Singaporean startups looking to learn how to grow quickly.

Historically the focal point of Silicon Valley has been located in Mountain View and Palo Alto, however, there has been a shift to San Francisco in recent years. In general, startups are now more liable to locate in inner city areas, rather than in industrial parks on the periphery of cities or universities, as the importance of proximity to R&D facilities has shifted to investors and bohemian areas for lifestyle reasons (Rossi and Di Bella, 2017). Consequently, the number of startups in San Francisco now outnumbers those in Silicon Valley more broadly (siliconvalleyindicators.org, 2022).

Additionally, Singapore has also been steadily building connections with Silicon Valley over the last 30 + years. One of Singapore’s sovereign wealth funds, GIC (Government Investment Corporation), has been present in the Bay Area since 1987, with the other (Temasek Holdings) joining in 2015, around the same time that Block71SF launched. There are also offices of various government organisations, including the Economic Development Board, Enterprise Singapore, and Smart Nation, as well as a NUS Overseas College programme that sent students to spend a year interning with firms and studying with Stanford University. Indeed:

“NUS Overseas College is the one actually that gives Block71 Singapore the kickstart because of all the students that did internship, when they went back to Singapore, they were the first batch of kids that had some success in launching their own companies. And from there, you know, of course, other students see that and they aspire to do the same” (Block71SF employee).

It was not just offices of government agencies either, but prior to the growth of the Singapore software cluster, Singaporeans often ventured to Silicon Valley to launch startups: “you just had to, back in the day... what’s here now wasn’t before” (Entrepreneur 3); Match.com, for instance, was co-founded by a Singaporean in Silicon Valley.

Consequently, according to one entrepreneur, one of the aims of Block71SF was a “broader sort of mandate of how do we build the bridge to all these overseas Singaporeans, and get them to come back to support in Singapore” (Entrepreneur 4). Not just Singaporeans, however, Block71SF also sought to attract other startups from Silicon Valley to Singapore:

“since the day we started, we said that we want to have this two-way exchange. You know, not just there to be a Singapore Center in San Francisco” (Block71SF employee).

With this clear aim to help stimulate the flow of startups between the Singapore and Silicon Valley software clusters, the Block71 spinoff organization ‘Block71SF’ was created, again through a collaboration between NUS enterprise, corporate firms, and government actors, to create a community hub for Singaporean startups to co-locate in Silicon Valley and for Valley-based startups to learn about possible routes into Singapore.

4.4. Block71SF and its Firms

Block71SF is open to both Singaporean startups who felt that they were ready to expand into the US market, or US-based startups that

wanted to use Singapore as its expansion base into the Asia-Pacific region. Therefore, this is not a steppingstone for all Singaporean startups wishing to scale up, but rather for those who have a specific technological or market interest in Silicon Valley and the US market. Similarly, only Valley-based firms with a serious interest in Singapore would be welcome. Consequently, while the office space has the capacity for more, the number of startups present at any one time has typically stayed around 20. While quite limited in the scope of their offerings, startups found the free office space, events, and limited connections to be critically important for their time there. Unlike MNEs who tend to have more financial firepower, the startups that were utilizing Block71SF did not have significant financial and organisational resources to aid with international expansion, and it was the founders themselves that would venture into Block71SF. Financial pressures are arguably the biggest factor facing earlier-stage startups and so removing the cost of office space was of significant value, especially in a city world-famous for its high rents, and while the contacts in place were not the most expansive, they were a vital first step.

These startups would come for typically between 6 months to a year and have an open invitation to return when it is beneficial. It is often the case that founders will fly back and forth between their Singapore office and Block71SF or their new Silicon Valley office multiple times throughout the year. While the majority users of Block71SF were Singaporean startups venturing into Silicon Valley and the US market (around 80%; Block71SF employee), there have increasingly been Silicon Valley-based startups that have utilized the space as part of a strategy to use the Singapore cluster to expand into the Singapore and Asia-Pacific markets (around 20%). Table 3 gives some examples of these firms. Respondents from Silicon Valley startups mentioned a quite rigorous interview process to ensure that they really wanted to expand to Singapore and were the right fit for potentially expanding into Singapore. Yet, these startups were treated to the same level of generosity that Singaporean startups were provided, with free office space given.

4.5. The hybrid institutional configuration of Block71SF

Block71SF exhibited a hybrid institutional configuration around social norms and behaviours that took aspects of both the Singapore and the Silicon Valley clusters. This hybridity becomes apparent when investigating how entrepreneurs from Singapore and Silicon Valley benefit from Block71SF. Singaporean entrepreneurs described Block71SF, for example, as follows: “socially it felt very Singapore, but business was San Francisco (Entrepreneur 4)”. On the social side, these

Table 3
Examples of Singaporean and Silicon Valley based startups and their post-Block71SF status.

| Firm (Country of origin) | Product/Technology | Status |
|--------------------------|--------------------------|--|
| Zopim (SG) | AI chat solutions | Acquired by Silicon Valley based Zendesk |
| ViSenze (SG) | AI solutions | Regional office Silicon Valley, HQ Singapore |
| TenCube (SG) | Wireless technology | Regional office Silicon Valley, HQ Singapore |
| Lomotif (SG) | Video software | Acquired by US based Vinco Ventures |
| Carousell (SG) | eCommerce company | Regional office Silicon Valley, HQ Singapore |
| LEDR technologies (US) | Business intelligence | Regional office Singapore, HQ Silicon Valley |
| GTRIIP (SG) | Contactless technology | Regional office Singapore, HQ Silicon Valley |
| Onsophic (US) | Digitalisation solutions | HQ Silicon Valley, Regional office Singapore |
| Spin (US) | eScooter company | Acquired by Ford |

Source: Author’s own.

were predominantly Singaporean or South-east Asian founders, who had moved across the world, and would benefit from a social security net of having people nearby who had similar lived experiences. For many, being able to have conversations about home, understanding the comparisons between the two places, and being able to find familiar food and other socio-cultural practices was important. Additionally, there were many common personal administrative issues, such as finding cheap and suitable housing, or working through visa issues, that were shared by almost all comers:

“you’re physically in San Francisco, but you know there are fellow Singaporeans in the same building with you, and probably 99% of the problems and things that you’re facing, they can relate to that very well” (Entrepreneur 4).

Block71SF created a safe haven for these Singaporean founders that encouraged them to interact with the new environment, which was further encouraged by having some US startups there to help “dispel some of the myths” (Entrepreneur 6) of Silicon Valley.

These founders from Singapore also shared the same drive and expansive goals for their startup in Silicon Valley, and so when discussing business problems, the tone took a more local setting. Furthermore, whenever outsiders would visit, social activity took a distinctly Silicon Valley form:

“the work culture, even the clientele, the clients that are visiting the offices, the investors that visit, it is all very Silicon Valley” (Entrepreneur 4).

Having some US-based startups present as well as hiring from the local talent pool also helped to ensure that the work culture took elements from what would be found in the broader host cluster.

This hybrid institutional configuration of social norms and behaviours also worked well for Silicon Valley based startups located in Block71SF. These firms were trying to expand into Singapore and Block71SF gave them an understanding of how both social and business interactions work in Singapore:

“Block71SF was definitely Singaporean... almost everyone who was there was affiliated with Singapore in some way... and now going to Singapore feels relatively easy” (Entrepreneur 5).

For Silicon Valley-based startups, Block71SF offered an institutional configuration that enabled them to understand the important institutions required to succeed in Singapore. Thus, the dominant Singaporean environment prepared these startups for what they felt was the biggest challenge with expanding into Singapore: the different business culture. Silicon Valley startups contrasted the need for stronger, well-developed, trust-based relationships as the core of networking in Block71SF and in turn doing business in Singapore. As one entrepreneur described it:

“building trust is usually much more important than immediately pitching or showing what you have or what you do.... reading between the lines is very, very important in their culture. So aside from trust, there’s also not everything seems like it is, you just need to engage and learn and be patient and do the tango in order to find out what’s really going on... which is the opposite of what it is in America” (Entrepreneur 6).

This stood in direct contrast to the speed of Silicon Valley and highlighted the naivety of some American startups: “many American companies travel to Singapore, just like they travel to, you know, Europe and say, ‘Alright, we’re gonna be there for weeks, and we’ll land some deals’, that just doesn’t work like that in Singapore” (Entrepreneur 6).

4.6. Reducing cognitive distances

This hybrid institutional configuration was a precondition for reducing cognitive distances between startups within Block71SF.

Important in facilitating this, however, was the spatial proximity enabled by the sustained use of free office space for startups. Having this potential for daily interactions over a sustained period of time increased the opportunities for (un)intentional interactions between them. For example, one respondent had his desk next to another founder who had been there for a year, who:

“was already raising a few rounds in Silicon Valley. So, I could ask him things like, ‘hey, you know, where are you raising from? Could you introduce me to some of those VCs that are investing in you?’” (Entrepreneur 4).

Interactions were also supported by Block71 organizers. Those who ran Block71SF contributed to form relations between the startups. Block71SF organizers provided the startups with many opportunities to engage with actors from both the Silicon Valley and Singapore clusters. One startup noted that the administrative team would offer them the opportunity to pitch when it arose: “[they would say] we have these visitors, you can pitch in front of them if you want, because there is this person that could be useful to you” (Entrepreneur 6); while local startups were told every time a prominent Singaporean investor or member of that cluster was visiting, so that they could gain exposure to that network: “they were very helpful in terms of introducing us to visitors anytime they came around from Singapore” (Entrepreneur 5). Furthermore, the US startups were often asked to:

“just mentor back, you know, inspire people, do talks, joint sessions, things like that, which was a lot of fun, and definitely valuable to us as well” (Entrepreneur 6).

In general, Block71SF organisers were relatively hands-off with the startups there: “[other accelerators] are driven to put you in the network, to place you, to force you to engage, that’s not the case in Block71, it’s ... organic, meaning it’s up to you how you proceed” (Entrepreneur 6). They provided an environment where a community could organize itself.

The benefit of this community in spatial proximity was enhanced by the staggered nature of their entry into Silicon Valley. This was not like a typical accelerator programme where cohorts of 10 startups would join and leave together; startups would come and go as and when it was relevant for them. This meant that founders who had been in Block71SF for a year or more could educate newer members with their experiences and share their contacts, who would in turn do the same for the next founders who arrived (Entrepreneur 4). It was also enhanced by both the Singaporean and US-based startups adding a different set of connections and sources of knowledge into the community.

4.7. Integrating into the Clusters

The hybrid institutional configuration, the learning processes and the connections made in Block71SF helped prepare Singaporean startups for entry into Silicon Valley:

“I think the network and introductions are probably the most important. Anyone could buy a flight ticket to Silicon Valley and you know, be physically there, regardless of where you’re from. But it is not so simple for you to have access; being physically there does not equate to access to the network, or to the community. So, you do need to have those kinds of introductions and connection to the right people” (Entrepreneur 4).

Interviewees described it as a gradual process where Singaporean startups integrated themselves into Silicon Valley. They firstly became accustomed to Block71SF and learning from those firms who already had been there, then slowly making connections with actors in the broader cluster, and finally becoming integrated into the cluster. Almost all of the Singaporean startups that went to Block71SF created partnerships in some form, with some being the recipient of takeovers by Valley-based firms (see Table 3). Others still moved their head office to

the cluster. While alumni are free to enter Block71SF on their frequent returns, respondents stated that it is not necessary any more due to the connections they have made (Entrepreneur 1; 4).

The community of Singaporean startups in Block71SF also helped US-based startups by sharing their own connections in Singapore with them, which helped them to find a foothold in Singapore:

“[Block71] feels like a place to get to know these people that may be coming to Singapore, because one of the biggest challenges that you have when you go into Southeast Asia, and then specifically Singapore, is no network. Just nobody knows you. And then making deals becomes really, really hard. So, you need to build a trust circle, people that believe in you, people that have seen you succeed” (Entrepreneur 6).

In some cases, Silicon Valley startups were also recommended to other Singapore-based accelerator programmes that share the same organisers, such as Pier71 (Entrepreneur 5), which applies startup solutions to the significant maritime and port sector. The startups also received help more directly from the key stakeholders such as SingTel, Innov8 or NUS enterprise:

“we received a lot of help from NUS enterprise... [who gave us] a lot of introductions to venture capital, or institutional investors. They introduced us to M1 at one of the events, which is a Telco that later became our investors... and usually it snowballs from there, right” (Entrepreneur 6).

Importantly, these Silicon Valley startups were also offered free office space at Block71 Singapore to ease the transition:

“having organisations who are already partners with that country’s stakeholders, and at least have a physical office for you to work at so that you can then get the ball rolling for the first few steps is tremendously helpful. Especially if you’re a startup with limited resources to set up your own office to do that” (Entrepreneur 6).

Evidently, both the Block71SF organization in conjunction with Block71 in Singapore, as well as the other startups who were using Block71SF, aided directly in helping US-based startups integrate into the broader Singapore cluster.

4.8. The formation of pipelines

The Singaporean startups that utilized Block71SF either expanded into Silicon Valley afterwards or set up a new headquarters there. They almost always kept office space in both clusters (Table 3). The same is true of the Silicon Valley-based startups who would keep a presence in Silicon Valley and perhaps even in Block71SF, whilst having an office in Singapore. This establishment of permanent locations in both clusters are examples of intra-firm knowledge pipelines as described by Bathelt and Li (2020). The regular travelling of founders between the two clusters describe the practices of how to utilize these pipelines.

We found several examples where firms used these knowledge pipelines to adopt practices from the other institutional context. For example, one Singaporean startup noted that they found the working from home culture that was prevalent in Silicon Valley to be beneficial and so adopted it in their Singapore office (Entrepreneur 1). Other knowledge that flows through these pipelines refers to venture capital. Entrepreneurs stated that Silicon Valley had a much more aggressive fund raising and spending culture, compared to Singapore where operations tended to operate on smaller budgets with less aggressive spending, and that this encouraged them to spend more aggressively in Singapore as well as Silicon Valley (Entrepreneur 1). Some US-based startups stated that the particular ‘Singaporean’ way of connecting with partners was not just relevant to their Singapore office, but would also be adopted in Silicon Valley depending on whom they were attempting to build relationships with. This experience was especially useful when operating in third countries with other social norms.

5. The institutional gateway and knowledge pipelines

When firms enter new clusters with no prior acclimatization the cognitive distance can be so large that they are incapable of bridging it and making connections. However, by entering Block71SF, Singaporean and Silicon-Valley-based firms were able to abate the difficulties of entering either Silicon Valley or Singapore by familiarizing themselves with respective norms and behaviours beforehand, with the help of Block71SF as an example of what we termed an ‘institutional gateway’, i.e. a place setup by one set of cluster actors in another cluster to facilitate the movement of firms and formation of connections between these clusters (Fig. 1).

Fig. 1 describes the processes of building knowledge pipelines through the institutional gateway. The shaded areas describe three different institutional configurations, where Block71SF is shaped by an institutionally hybrid environment. Block71 in Singapore has not yet received enough firms that have experienced the Silicon Valley institutional configuration to have changed significantly, though this may happen over time. The arrows represent different connections between Singapore and Silicon Valley. The first connection refers to firm (re-) locations, where, for example, Singapore firms usually establish a new office in Block71SF first, which later move to the broader Silicon Valley/San Francisco area. These lines also represent intra-firm knowledge pipelines. The dashed lines represent knowledge pipelines outside the firm.

Using the example of Block71SF, we can derive the following mechanisms by which an institutional gateway helps to form global pipelines between places shaped by different institutions like Silicon Valley and Singapore. The institutional gateway works in both ways, yet, we take Singaporean firms moving to Silicon Valley to exemplify these processes. The first process is the reduction of cognitive distances via reducing institutional difference. Becoming acquainted with a new shared institutional context enhances communicability and in doing so reduces cognitive distances. However, reducing cognitive distance requires interaction. Menzel (2015) argues that increasing network and spatial proximity facilitates interactions and thus reduces cognitive distance between actors. We saw the importance of network proximity through the organized connections between the different firms offered by Block71SF and connections that formed within the community. Yet, this is only a secondary benefit enabled once the cognitive distances were already reduced to a certain extent. Therefore, spatial proximity, particularly being located in the same shared workspace, was important in facilitating the reduction of cognitive distances. In this vein, especially the temporality of geographical proximity plays an important role. Firms stayed in the hybrid institutional configuration of Block71SF for several months to a year. By having this acclimatization process, Singaporean and Silicon Valley-based firms were able to prepare for business in Silicon Valley and Singapore, respectively. They were able to

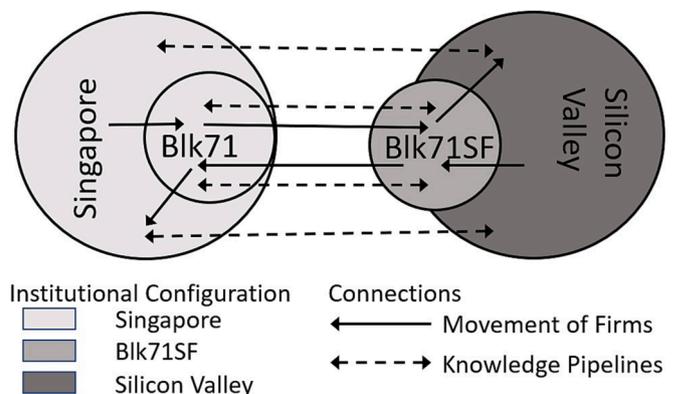


Fig. 1. Block71SF as an institutional gateway and its effects on knowledge pipelines.

adapt to new institutions, make new connections, and attend more events, experiencing more interactions. Therefore, the most important aspect of Block71SF is the co-location of various firms in a shared space for a sustained period of time.

To appreciate the time taken to decrease cognitive distances in a spatial setting, we speak in the following of ‘temporal co-location’. Temporal co-location is situated between temporal proximity and co-location. ‘Temporal proximity’ can last between a few hours, like in meetings (Torre, 2008), or several days as described in conferences, fairs, and trade shows (Maskell et al., 2006). Co-location describes the permanent geographical proximity between firms due to their localization (Maskell and Malmberg, 1999). Accordingly temporal co-location describes a time span in between. In our example, this time span was several months to a year. This different temporality leads to different learning processes (Menzel, 2015), offering the semi-permanent co-location necessary to bridge cognitive distances and build up localized capabilities (Maskell and Malmberg, 2007).

Furthermore, the importance of temporal co-location is amplified by the fact that the Block71SF firms do not come in cohorts, akin to accelerator programmes, but come and go in a staggered format. Newcomers can learn from those already there, before then passing on the knowledge and connections to those firms that arrive after them. Thus, the temporal co-location is also the basis for the formation of a dynamic community.

This reduction of cognitive distances within the institutional gateway facilitates relations also outside its boundaries. First, Block71SF firms formed relations and knowledge pipelines in the Silicon Valley cluster, which eventually even lead to acquisitions. Second, Block71SF firms transferred knowledge between Singapore and Silicon Valley, especially via intra-firm knowledge pipelines like particular practices, procedures or employee mobility. Third, firms left Block71SF as they became embedded in the Silicon Valley context and did not require the particular environment of Block71SF anymore. Fourth, we could see that these processes also created externalities. Increased labour mobility between Singapore and Silicon Valley and the formation of a community and knowledge spillovers further intensified connections between Silicon Valley and Singapore outside Block71SF.

In our example, the knowledge that was transferred via these pipelines was mostly institutional knowledge, e.g. knowledge regarding venture capital behaviours, formation of relations or working conditions. While knowledge pipelines mostly refer to technological or market knowledge, the transfer of institutional knowledge should be expected as the main reason for the establishment of Block71SF. The institutional gateway helps to translate this institutional knowledge from one context to another.

Additionally, via this transposition (Powell et al., 2012) of institutions between Singapore and Silicon Valley, the institutional gateway might contribute to a closer institutional alignment of the respective clusters over time. Accordingly, the institutional gateway might not only contribute to reduce cognitive distances within its boundaries, it might also contribute to reduce cognitive distances between places and in doing so make the institutional boundaries of clusters more permeable (Maskell and Malmberg, 2007; Menzel and Fornahl, 2010).

6. Conclusion

The starting contention of our study was that to maintain a cluster’s diversity, firms have to form connections to clusters that are different. Yet, these connections are difficult, because clusters have developed along different paths and within varying cluster institutional configurations, which creates potentially large cognitive distances between them. Thus, firms trying to form relationships with those in another cluster have a liability of outsidership (Johanson and Vahlne, 2009).

We used Block71SF as an example of how these cognitive distances can be reduced as a pre-condition to form successful global pipelines.

Block7SF did so by taking elements of both the Singapore and Silicon Valley cluster institutional configurations and melded them into a hybrid institutional configuration. In this instance, respondents described it as socially-Singapore and business-Silicon Valley. This hybrid institutional configuration, in combination with a supportive environment and temporal co-location of firms, contributed to reduce cognitive distances. Evidence for this is particularly the Singapore based firms that did not need the environment of Block71SF anymore to operate within Silicon Valley.

Insights about this institutional gateway contribute to the cluster literature in the following ways. First, the institutional gateway concept adds to the debate on global pipelines and the internationalization of firms (Johanson and Vahlne, 2009; Graf, 2011; Lorenzen and Mudambi, 2013; Bathelt et al., 2018). The concept opens up a new avenue for firms to generate knowledge pipelines with actors in disparate clusters. The global pipeline literature documents how large but ultimately individual firms secure their own knowledge pipelines, or how smaller firms use trade fairs to get in touch with firms from other places. Yet, the focus is usually on the single firm. Institutional gateways like Block71SF, however, take the onus off individual firms and the Block71SF story is about how an organization helps to form a dynamic community of actors that aid each other in forming connections to the other place (Bathelt and Cohendet, 2014).

Second, our case showed the possible role of temporal co-location for cluster evolution. Forms of temporal co-location also take place in other places like co-working places, maker spaces or business accelerators (Schmidt and Brinks, 2017). Just as with the institutional gateway, these places bring firms in close spatial proximity for a period of time, creating potentially unique institutional configurations and externalities. Yet, how these places of temporal co-location contribute to internal variegation of clusters is a question for further research.

Third, what might be flowing through global pipelines is not simply technological or market knowledge, but also knowledge about institutions, ‘how to do thing’, and norms. As a result, knowledge pipelines between places would contribute to an institutional alignment between these places, which affects also the boundaries of the cluster; this effect is already described by Saxenian’s (2007) Argonauts. How pipelines between places creates institutional alignments as externalities that facilitates further knowledge pipelines between these places requires further investigation.

There are of course several limitations to our study. We studied software startups which have a distinct advantage in that they are relatively footloose in their location due to the typically virtual nature of their products (Rossi and Di Bella, 2017). How applicable this concept may be for other industry sectors, particularly those with significant manufacturing footprints or with high-secrecy requirements, remains to be seen. Additionally, we described a particular form of institutional gateway, which was notably shaped by temporal co-location. There are also other forms of institutionalized exchange between two different places that might be defined by different mechanisms, but have the same effect of reducing cognitive distances. Examples could be exchange programs, offices of cluster organizations in other places, or firm transplantation. Yet, the important point is to investigate how these forms enhance communicability between institutionally different places and in doing so help to reduce cognitive distances and establish connections.

7. Credit author statement

Jack Harris and Max-Peter Menzel: idea and research goals; preparation of the manuscript, revision; Jack Harris: methods and field work; Max-Peter Menzel: theoretical conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial

interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The authors do not have permission to share data.

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