Inter-Organizational Knowledge Sharing: Innovation and Regional Clustering

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Introduction

In a 1994 interview, Steve Jobs brazenly paraphrased a popular quote from the artist Picasso on innovation and creation, "Picasso had a saying -- 'good artists copy; great artists steal' -- and we have always been shameless about stealing great ideas." (Farber, 2014) This quote illustrates much of the way Silicon Valley has functioned since it emerged as a hot spot for technological innovation. Despite Jobs' admittance that he and his peers have, at one point or another, stolen great ideas, Apple, Xerox, Google, and other major players in the valley have all been embroiled in lawsuits alleging illegal copying and stealing at one point or another. However, the difficulty with those lawsuits has always been whether or not the organizations in question have actually copied, or simply used the knowledge shared so openly amongst Silicon Valley employees.

Knowledge sharing in Silicon Valley has been a major defining characteristic to its culture, becoming a draw for both well-established companies and start-ups. The movement for encouraging this knowledge sharing began with Frederick Terman, a Stanford University provost and professor, who encouraged a "collective learning" mindset even amongst competing companies. (National Museum of American History, 2010).

Of course, Silicon Valley is not the only major hot spot for specialized industries in the world. The purpose of this literature review will be to explore knowledge sharing for innovation and how regional clustering can encourage inter-organizational knowledge sharing. It will seek to answer the following questions:

- Why is inter-organizational knowledge sharing important?
- What is the case for regional clustering?
- With increasingly digital ways of working, do organizations need to be located in these regional clusters for the purposes of knowledge sharing and innovation?

The goal is to illustrate how inter-organizational knowledge sharing can benefit innovation and to discuss whether regional clustering is a notion of the past, and if or how a model such as Silicon Valley could be translated elsewhere.

Organizational Knowledge Sharing

Networking and socialization as a source for knowledge sharing within organizations is a well-documented trigger for innovation. Knowledge shared through these diverse networks can influence both tangible and intangible processes or products across divisions or departments both vertically and horizontally (Nonaka & Takeuchi, 1995, p. 106). In particular, *communities of practice* demonstrate well the voluntary exchange of tacit, explicit, and cultural information to mobilize knowledge sharing within an organization. (Choo, 2006, p. 164) However, as Brown and Duguid point out, communities of practice can too easily become silos. If the knowledge shared and created within a community of practice can't be transferred outside of itself, the entire concept of such a community doesn't work. (Brown & Duguid, 2000) A process of some sort should be put in place to ensure this shared knowledge is able to extend beyond, similar to the Eureka case study and ‘water cooler effect’.

The ‘water cooler effect’ is the belief that employees will share their knowledge by the ‘water cooler’ (or in passing during breaks over the course of the day with other employees they encounter). In Choo's explanation of the Eureka case study, knowledge was being swapped around the ‘water cooler’, but only amongst a few people and didn't reach the wide enough audience that was necessary. So, while it worked on a small scale, it wasn’t as impactful as it necessarily could or needed to be. Eureka was designed to allow employees to share that same ‘water cooler’ knowledge online to reach that wider audience, and effectively making this process digital. (Choo, 2006, p. 175)

However, while a system such as Eureka is likely very helpful for sharing tacit knowledge and allowing others to easily search and find the knowledge that they need in a database, I’d be cautious as an organization to rely only on Eureka and doing away with promoting water cooler-type knowledge sharing opportunities. To further this point, Kristie Lynn McAlpine researched the impact of flexible work options (such as online/remote work) in their 2017 dissertation on the water cooler effect. In it, they found that, "...idea generation is highest when teams communicate informally face to face. Thus, teams were not able to effectively make up for the loss of face-to-face informal communication by using electronic media..." (McAlpine, 2017, p. 42) So, while a Eureka-like system is a great idea to share knowledge, it should not replace face-to-face communication opportunities.

Inter-Organizational Knowledge Sharing

Inter-organizational knowledge sharing means organizations, whether they are in the same industry or not, will swap knowledge with one another. Much like the water cooler form of knowledge sharing, the idea is that employees will discuss their insights with a peer from another organization, and then bring this new knowledge back to their own organization to help further innovation. Some of this can be achieved online, while some organizations may need to encourage this by locating their offices to a 'regional cluster' to help promote inter-organizational networking.

Inter-organizational knowledge sharing is considered important for companies to stay competitive, keeping up with the trends or new innovations. Inter-organizational knowledge sharing does not have to be entirely between producers of goods, as a similar level of awareness to new ideas could be achieved through educational or research institutions. (Nooshinfard & Nemati-Anaraki, 2014)

Knoben and Oerlemans, in *Proximity and inter-organizational collaboration: A literature review* argue that an organization can still have a strong inter-organizational network without being geographically close to other similar organizations so long as technological proximity and organizational proximity are similar. That is to say, organizations that share knowledge have similar 'technological knowledge bases' and cultures of working. (Knoben & Oerlemans, 2006) However, a geographically isolated organization loses out on the potential individual employees' knowledge sharing opportunities, which is much of what makes Silicon Valley such a strong example for geographic proximity.

Regional Clustering

Gupta and Wang argue the need for regional clustering in what I believe to be the simplest of terms:

> "Physical proximity to technology creators, cutting-edge engineering talent, complementors, and even competitors matter. Geographic distance can become a major impediment when you don't know who you need to talk to and when you're trying to tap into people's only half-formed ideas about the technologies and products they're trying to develop. You need to be plugged into the local informal networks." (Gupta & Wang, 2016)

In particular, Silicon Valley is a mecca for technology entrepreneurs armed with little more than a dream to become one of the most envied regions for innovation. Organizations flock to the region for the exact reason that Gupta and Wang have pointed out. However, the story of Silicon Valley goes beyond simply being in close proximity to competitors and suppliers. It has a culture deeply rooted in knowledge sharing, and that has been the key to creating a culture rich in both competition and, at the very same time, inter-organizational cooperation.

Gupta and Wang, along with many other information professionals, cite Annalee Saxenian's *Regional Advantage* as the basis for their takes on regional knowledge sharing. In *Regional Advantage*, Saxenian compares Boston's Route 128's downfall to Silicon Valley's continued rise, two of the United States' most prominent regions for industry clustering (or, regional clustering). Most notably, she emphasizes the difference in work cultures, particularly when it comes to knowledge sharing.

Regional clustering occurs because "…of the importance of timeliness and face-to-face communication for rapid product development." (Saxenian, 1994, p. 5) Thus, firms who may be producing similar products or offering similar services will cluster in that particular region. Saxenian argues that the success of a region such as Silicon Valley goes beyond the draw of specialized suppliers, and highlights the fall of Boston's Route 128 as an example. (Saxenian, 1994, p. 6) Route 128, similar to Silicon Valley, once attracted a host of major technology companies and had a similar rise to power as Silicon Valley at around the same time. Route 128, however, did not attract the same types of start-ups which would help buoy and eventually thrust the Valley back into the spotlight.

By the 1970s, turnover was and continues to be extremely high for Silicon Valley's organizations -- not because employees were necessarily unhappy with their jobs, but rather it was the norm. Start-ups were the big draw, attracting experienced employees who would stay for a couple years to help these organizations get off the ground, then move on to the next challenge, sometimes just down the street. (Saxenian, 1994, p. 35) This mobility led to strong loyalties to personal networks that employees made as they changed jobs rather than companies, and through these networks and loose noncompete clauses (which I'll touch on later) a lot of competitive information was shared among the various organizations the employees worked for. This shared knowledge was generally considered tacit and useful knowledge, allowing the employee to evade nondisclosure agreements and promoting that culture of shared knowledge. (Saxenian, 1994, p. 36-37) Like puzzle pieces, employees beginning at their new organizations could apply their past experience in a different way and, at the same time,

show new colleagues tricks, allowing Silicon Valley to become one of the fiercest regions for technological innovation.

On the contrary, Route 128 found employees to be extremely loyal to their organizations, staying to work up the ladder and were not given any stock options unlike Silicon Valley employees who were offered these from the start. (Saxenian, 1994, p. 77). Where Silicon Valley employees were able to come and go as they pleased, dispersing their knowledge to other organizations while still being offered a sense of pride to give their all to their current organization, those employed around Route 128 kept to themselves and their singular organization. Thus, knowledge did not flow freely.

Higher education institutions such as Stanford and local community colleges played pivotal roles in the region's dissemination of information, with research labs working hand-in-hand with local organizations and bringing top engineers or other regional figureheads into lectures or as consultants for new curricular. (Saxenian, 1994, p. 41-42) In contrast, MIT, located by Boston's Route 128, refused to shift and shape their offered programs to the neighboring industries. In what I believe to be the most illustrative of the vast difference in the two regions' knowledge sharing cultures, Stanford commercialized their research through a licensing office from early on, while MIT did not until, I would argue, it was too late for Route 128 to benefit. (Saxenian, 1994, p. 66) Stanford's office was set up in 1969, around when Silicon Valley began skyrocketing, while MIT's was set up sometime in the 80s, only for Route 128 to fall into disarray shortly thereafter.

To be fair to Route 128 and as Gupta and Wang point out in a piece for Harvard Business Review, Massachusetts has always had far stricter noncompete laws than

California, which has had virtually none. (Gupta & Wang, 2016) There are pros and cons to these noncompete laws: on the one hand, noncompete practices give organizations a sense of security that their ideas will not be copied without their consent, thereby not leaving the original organization vulnerable to tougher competition; on the other hand, noncompetes could impede industry innovation, such as with employees worried about sharing the knowledge they've gained from past organizations in fear of legal action.

Silicon Valley created its own safety net by promoting a culture rich in shared knowledge, ensuring organizations had access to a seemingly endless knowledge base so that if they faltered in one area, they could quickly pivot to another to keep up with the times. Even in the 1980s with the semiconductor memory business fading, when this desire for new challenges and peer-to-peer knowledge sharing began to wane, the idea that one can learn from their mistakes (such as a firm or individual) was still so deeply ingrained into its culture that it helped to buoy them from flaming out. (Saxenian, 1994, p. 112)

While Saxenian doesn't explicitly say that this culture of sharing and openness seeped into intra-organizational managements, it's difficult not to relate her illustration of Intel's decentralized system under Robert Noyce and Gordon Moore to the region's influence, "A major purpose of these organizational structures was to facilitate the exchange of ideas and information. Openness and confrontation were encouraged at Intel." (Saxenian, 1994, p. 53) Such systems are now prevalent in Silicon Valley, which allows these companies to operate and innovate in such a rapidly changing industry. It all goes back to the idea that teams from different departments and even different

companies should mix and mingle with little authoritative go-between in order to continue passing along the knowledge these individuals pick up over time.

It is this decentralized system which Saxenian believes to be the key to creating another Silicon Valley, or perhaps revitalizing Boston's Route 128. With blurred lines and looser restrictions, shared knowledge will be able to flow more freely between organizations, and, I would argue, influence that same knowledge sharing culture within an organization much like a domino effect given the example of Intel. (Saxenian, 1994, p. 162)

To add to that, there is also a strong venture capitalist firm presence in Silicon Valley which functions very differently from traditional venture capitalist firms. Normally, a venture capitalist would evaluate start-ups to decide whether or not they might want to invest in return for equity. In Silicon Valley, their roles go beyond investment. Venture capitalists will often have some form of industry experience, whether by working directly in the industry or having gained knowledge from past investments over years or even decades, and can advise entrepreneurs with an unbiased view. Some will go so far as working alongside employees. (Ferrary & Granovetter, p. 337-338) As Ferrary and Granovetter explain, the venture capitalists also share their own knowledge with others in their firm, who may be investing in similar companies. Once again, a reflection of the region’s knowledge sharing culture.

Interestingly, much of the way Silicon Valley's organizations function and support knowledge sharing fall in line with Nooshinfard and Nemati-Anaraki's study *Success factors of inter-organizational knowledge sharing: a proposed framework*. They cite a few particular organizational factors that better support inter-organizational knowledge

sharing including: culture and organizational climate, motivation, reward and recognition, management leadership and support, and organizational structure. Particularly with organizational structure, they back up Saxenian's decentralized system, "Formal and centralized structures often dampen knowledge sharing successes, while a more flexible and informal structure facilitates it." (Nooshinfard & Nemati-Anaraki, 2014)

Inter-Organizational Knowledge Sharing in a Digital World

With more and more organizations in different industries moving to remote or online work, the question is: do they need to be in these regional clusters? With COVID-19, we've had to adjust the way we usually work, and in some ways these offline-to-online shifts opened what may have usually been regional networking and knowledge sharing opportunities to global opportunities.

As Michael Price for Science points out, "The new format […] offers opportunities—for reaching wider audiences, reducing the carbon footprint of meeting travel, and improving diversity and equity. For some meetings, the shift may be permanent." (Price, 2020) In this case, Price was referring to conferences aimed at scientists, a profession which relies greatly on shared knowledge. Price talks to Russ Altman, associate director of the Stanford Institute for Human-Centered Artificial Intelligence, who explains that not only did these online conferences draw more attendees given the format, but Q&A sessions were also more productive because moderators could pick and choose questions that furthered the conversation from the text chat rather than calling on just anyone with a question that could be irrelevant.

Price is still careful to point out that keeping everything online could be tiresome, and that sharing ideas and research in person while passing by a colleague in the hallway (the 'water cooler effect') is still important, all of which I agree with. But for impactful conferences in an industry that demands so much innovation and research, it's hard not to see past the benefits of at least keeping some of these events online to open it to a wider audience and therefore greater opportunity to pass around knowledge. I would argue that it may be of interest to keep smaller conferences offline, perhaps for more niche research so individuals can still get that face-to-face communication while still recording and uploading them online for wider dissemination.

As for day-to-day working, major companies including Facebook have already announced that employees may request to permanently work from home, while others including Apple ask for a couple days in the office at a minimum. While these remote employees may go out and socialize, it will be interesting to see whether their lack of mingling in office-type settings will have an effect on innovation.

Implications & Practices

Tried and true practices such as communities of practice are still beneficial to the sharing of knowledge to help impact innovation. Digital knowledge databases such as Eureka are excellent systems to spread knowledge outside of those communities, as well as hosting research-based or other similar conferences online. However, while the world spins quickly into online or remote working styles, face-to-face communication is still important for innovation. While remote working does give employees flexibility, some opportunities for knowledge sharing which lead to innovation could be lost with

purely digital interactions. Having a balance of remote and in-person work should be considered, and the same can be said for events or conferences.

Regional clustering, done right, can be extremely beneficial to inter-organizational knowledge sharing to encourage organizational innovation. It gives organizations security in rapidly changing industries as knowledge is passed around with the ease of proximity, allowing them to keep up with trends or new advancements. However, the region and its organizations must help to foster this culture.

In *The power of reciprocal knowledge sharing relationships for startup success*, the authors explain that if employees (or, in their case, researchers) are not actively engaging in productive communication, the regional argument for knowledge sharing is null, as there are no more benefits to in-person interactions than there are in digital interactions. (Allen, Gloor, Colladon, Woerner & Raz, 2016, p. 646) Organizations should encourage employees to be productive in their knowledge sharing, potentially sponsoring communities of practice.

In considering the case of employee mobility in Silicon Valley versus Boston's Route 128, it sounds a bit radical to say organizations should allow employees or even encourage them to come and go as they please, as that might give organizations reason not to support or celebrate employee loyalty which, I would argue, may lead to an unhealthy work environment where employees may not feel cherished. However, encouraging employees to continue learning, to offer them conference passes or even accepting an employee back who previously left and has since gained new knowledge elsewhere may be beneficial to allow the organization to continue learning from within.

Likely the strongest case for an organization to locate to a regional cluster is for the benefit of its employees. Close proximity to competitors and suppliers will allow individuals to closely interact and absorb knowledge from outside peers in casual settings. When coupled with an organization's decentralized system and milder noncompete clauses, individuals will feel further encouraged to exchange knowledge and bring new knowledge into their organizations to help further innovation.

Conclusion

So perhaps we don't want to say, as Steve Jobs implies, that organizations should 'steal' one another's ideas, but rather exchange ideas for the sake of innovation. While inter-organizational knowledge sharing, particularly between competitors, may at first sound threatening to an organization's best-kept secrets, it only boosts the knowledge sharing an organization needs in order to stay competitive and react quickly in rapidly changing industries. An isolated organization relies on itself for warnings or new ideas, whereas an organization which opens itself up to others is able to listen in on hundreds of other voices. Individuals are a key component to this inter-organizational knowledge sharing. It is through their networks, particular in regional clusters, where knowledge sharing can occur almost naturally. These regional clusters, supported by the organizations within, will aid the individuals to broaden their networks and bring back new information.

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