Google and Niantic Labs: The Professional Entrepreneur and Innovation in the Silicon Valley (A)

Silicon Valley, the mother lode of the high-tech business, has another gold strike under way.
—TOM BROKAW
Journalist, July 21, 2011

When you come to a fork in the road, take it.
—YOGI BERRA
National Baseball Hall of Fame member and philosopher

As the northbound traffic slowed to a crawl along Interstate 880, the major freeway corridor along the San Francisco Bay Area’s East Bay, on a clear weekday evening in late January 2015, John Hanke, the head of Google’s Niantic Labs, pondered the startup’s next steps. As one of Google’s many embryonic businesses, Niantic Labs was created in 2010 to discover what opportunities might emerge as mobile, geo-location, social, and gaming trends intersected. Since then, Niantic had become best known for its globally popular augmented reality (AR) game entitled “Ingress”—which had been downloaded over 3 million times—where players participated in a multi-user online game (MMOG) as “agents” of two rival teams—“The Enlightened” or the “The Resistance”—and used their smart phones to virtually secure key “portals” and earn points for both their team and themselves. Unlike the stereotypical image of couch-based video gamer, Ingress participants were required to physically trek across their neighborhoods, communities, and cities,1 to capture these portals, which were often public works of art or landmarks of historical significance. What made this “social” game unique was that this intersection was both virtual and real at the same time.


Professor Jerome S. Engel prepared this case study, with assistance from Case Writer Dickson L. Louie of the ClearLake Group, as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

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Among his many options, there were two distinct alternatives. One alternative was to keep Niantic Labs and its 40 employees as a "skunkworks"-type operation within Google, along with its many experimental businesses, such as Project Loon, Google Fiber, or Calico (Exhibit 1). Since joining Google 2004, when Hanke’s earlier company, Keyhole, was acquired, Google had shown spectacular business growth. At the time of its August 2004 IPO, Google had annual revenue of $3.1 billion, nearly 2,000 employees, an average of two million search inquiries per day\(^2\) (powered by its proprietary PageRank algorithm), and a market capitalization of $23 billion. A decade later, at the end of 2014, Google had annual sales of $45 billion, approximately 57,000 employees, an average of 3.5 billion search inquiries per day\(^3\) and a year-end market capitalization of nearly $350 billion. Google’s search advertising business—AdWords—still generated approximately 80 percent of its revenue and provided the highly profitable gross margins of nearly 60 percent\(^4\) that enabled the company to invest in many seemingly unrelated long-term projects.

The other alternative—the more complicated choice—was to spin Niantic Labs completely out of Google into a separate stand-alone business. While Niantic Labs would no longer be entirely owned by Google, this option would provide the Niantic team the chance to grow the company on their own, focus entirely on developing AR games on their own platform, and have the freedom to create partnerships with other gaming content providers and console providers—free of concern for alignment with Google’s strategic interests. The downside of doing so was that Niantic Labs would have to raise capital from investors, build a separate infrastructure, and no longer have immediate access to Google’s talent base, particularly its software engineers. Raising capital for a stand-alone company had its own complexities. As an experienced and successful entrepreneur Hanke believed he could be successful obtaining financing on acceptable terms from venture capitalists, however, there might be advantages to entice corporate investors with deep capabilities in the gaming industry. These included the Pokémon Company and Nintendo, whose executives had been impressed by the Ingress game and were interested in possibly exploring a closer relationship with Niantic.

As Hanke considered the two options, he also realized that with Niantic Labs, his professional career had come full-circle over the past 20 years (Exhibit 2). Since enrolling and graduating from the MBA program at the University of California’s Haas School of Business in the mid-1990s, Hanke had founded three startups before selling Keyhole to Google in 2004. After serving as Google’s vice president for geo-products—Google Earth, Google Maps, Google StreetView, Sketch-up, and Panaramio—and overseeing a worldwide staff of almost 2,000 “Googlers” over the next six years, Hanke then decided to return to his entrepreneurial and gaming roots when he oversaw the creation of Niantic Labs within Google in 2010. Now, as a still-boyish-looking 47-year old, he was carefully thinking of what his next step should be.

According to industry projections, the combined worldwide revenue for augmented games and virtual games (AR/VR) was projected to grow from $3 billion in 2016 to $150 billion in 2020 (Exhibit 3a). AR was expected to account for almost $120 billion, or 80 percent, of the amount forecasted for 2020, broken down across various segments: hardware, aCommerce, data, voice, film/TV, enterprise, games, and theme parks (Exhibit 3b). AR differed from VR in the sense that AR devices often layered—or “augmented”—images on top of the real physical world, whereas VR devices provided a completely immersive, out-of-body experience (Exhibit 4a). Broadly

\(^2\) Google, IPO, September 2004.
\(^3\) Google, 2014 annual report.
\(^4\) Google, 2014 annual report.
defined, the use of AR has existed since the creation of the rear view mirror in the early 1900s and more recent applications have included military training, commercial flight simulators, and Google Glass (Exhibit 4b).

For Hanke, there were several key questions: Which option would allow Niantic to best take advantage of this projected AR growth? Which option would benefit Hanke and his team, Google, and any other potential investors the most? What were the pros and cons of each? And how could Hanke—as he had shown repeatedly throughout his professional career—best leverage upon his past experiences, particularly from the knowledge gained from Keyhole’s spin-in with Google?

**Background of John Hanke**

Hanke’s journey through his professional career is a great example of the Silicon Valley professional entrepreneur who recognizes trends, pursues these opportunities relentlessly, and then monetizes them. His story also demonstrates the dynamic interaction of the key components of Silicon Valley’s high-tech ecosystem.

**Texas Roots.** Born and raised in Cross Plains, Texas—a tiny whistle stop-town of nearly 300 families5 that was best known among pulp fiction devotees as being the birthplace of Robert E. Howard, the creator of the “Conan the Barbarian” character—and the son of the local postmaster, Hanke was a self-taught programmer who had first learned how to code when he was a young teen in junior high school.6 As an undergraduate student at the University of Texas at Austin during the late 1980s, Hanke developed a keen interest in global affairs and he chaired the Distinguished Speakers Series that brought a number of accomplished individuals to lecture on campus, including former U.N. ambassador Jeanne Kilpatrick, novelist Kurt Vonnegut, Jr., and New York Times photographer Dith Pran.7 After graduating from UT with honors in 1989, Hanke pursued his interest in global affairs with the U.S. State Department’s Foreign Service, with assignments in both Washington D.C. and Myanmar.8

**The Berkeley Connection.** After spending five years with the State Department and deciding against becoming a career diplomat, Hanke chose to return to his original interest in computer technology and headed west to UC Berkeley, where he joined the MBA program in the fall of 1994. Hanke recalled:

“It was a career transition for me. I grew up in the dawn of the personal computer era and was very passionate about programming back in the early days of the Apple and Atari. But it didn't really seem like a legitimate career [then]. [After working in the State Department,] I wanted to try to get back to technology. I figured that [if I was] moving to the West Coast, a MBA was a way to get established out there. I didn’t know anything about business, having worked in the government. So I figured that I needed to learn a bit about accounting,

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7 Dith Pran was also the subject of the Academy Award-winning film “The Killing Fields.”
8 Engel and Forster, op. cit.
finance, marketing, and other subjects. To me, it was establish your network on
the West Coast and [then] learn some basic skills for what you want to do.”

**Early Entrepreneurial Successes.** As a full-time MBA student at Berkeley, Hanke took aim at
creating his first startup in 1994 in the student incubator lab provided by the business school’s
Lester Center for Entrepreneurial Studies, where Professor John Freeman served as its academic
director and Professor Jerome Engel as its executive director. Together with Steve Sellers, a
fellow MBA classmate, they founded a gaming company called Archetype Interactive in the
basement of a local hotel—space funded by the Center. Hanke noted:

> “I loved programming games and thought that type of entertainment was
> interesting. I had an aspiration for starting a company based around gaming when
> I came out to the business school.”

In starting up Archetype Interactive, Hanke demonstrated that he was not content with
just being in the classroom and hearing professors and guest speakers lecture about what
it took to start up a company—he wanted to do it. With additional pro bono help from a
Silicon Valley law firm in incorporating the company and raising a few hundred thousand
dollars from family and friends, Sellers and Hanke then put together a small team, which
eventually grew to 20 employees, to create a product. Hanke recalled:

> We figured it out as we went. We knew that we needed to have more people to
> work on the application. We figured out how to raise some money, so we could
> hire some contractors…We went out on the Web—a common thing now, but a
> novelty back then [in 1994]—and found engineers, game designers, and artists.
> At the same time [at Berkeley-Haas] we learned how to set up a company, how to
> take in the money, and how to split everything up. We immediately put [those
> concepts] into practice.⁹

Archetype’s first and only product was Meridian 59, now credited as being the first 3-D graphical
massively multi-user online role-playing game (MMORPG or MMOG). This was a direct
extension of the innovations being championed by Netscape co-founder Jim Clark at the time,
converging the opportunities provided from the soaring popularity of the Internet with the
emergence of browser usage that allowed consumers to easily surf the Web.¹⁰ Hanke added:

> “There was only one trend when we were going through business school and that
> was the Internet. Netscape was in the process of coming into existence with its
> Mosaic browser when we were at Berkeley. It was still the dial-up modem days
> and the earliest days of the Internet. We were all trying to figure out how it
> would be relevant to the things we were interested in. Several companies got
> started by classmates during the time when we were at school. Steve and I started
> [Archetype]. We sold it on the day that we graduated [in May 1996].”

After selling Archetype Interactive to Trip Hawkins and 3DO, a then-leader in the gaming
industry, for a “few million dollars,” Hanke and Sellers stayed at 3DO for nearly a year before

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⁹ John Hanke, Berkeley-Haas, October 11, 2007 presentation, “Distinguished Innovator Lecture Series,” YouTube,
https://www.youtube.com/watch?v=M4W7IeVRqQ

¹⁰ Engel and Forster, op. cit.
starting up another gaming platform called The Big Network, which focused on casual games like chess and checkers.\textsuperscript{11} A year later in 1999, they sold The Big Network for several million dollars.

**Keyhole\textsuperscript{12}**

**Early Beginnings.** With two solid “modest” successes under his belt and strong expertise in 3-D visualization, Hanke had credentials that passed for a seasoned Internet startup CEO in the pre-Internet bubble days of the late 1990s. The next challenge was not far away. A few months after selling The Big Network, he was already in search of his next entrepreneurial quest. Hanke was introduced to a talented technical team that had left Silicon Graphics to build at a new computer game startup and was shown an early demo that showcased a software technique to display and animate extremely high-resolution images with amazing graphics on a normal PC. The demo gave the feeling of being in space, seeing a globe textured with images and with the ability to zoom in and out of cities.

The company, Intrinsic Graphics, and its investors were committed to being a game company, and Hanke saw something about the opportunity to create a “space platform” for earth images. The investors were not interested, considering it a “distraction.” Hanke remembered that when he first saw it, he felt “a chill up my spine.” At the time, space imagery was at a major technical inflection point as improved and higher resolution images were just becoming commercially available. Based on his previous experience in foreign affairs, Hanke foresaw the power of layering data on maps, using satellite imagery, and creating an entirely new type of geo-mapping experience (Exhibit 5a). As geographic information systems (GIS) evolved from basic computer mapping in the 1970s, then to the use of spatial database management in the 1990s, and finally to multimedia mapping in the 2000s (Exhibit 5b), Hanke anticipated that this data and user expertise would be valuable to high-value niche markets like real estate developers and eventually to the mass-market audience as well. Unable to convince Intrinsic Graphics investors to endorse his vision, he struck a deal to spinout the technology that supported the demo, recruited several of its key engineers and formed a new startup called Keyhole, with Hanke becoming its CEO.

**Initial Financing.** In January 2000, nearing the peak of venture capital investment in the Internet, the company received its first round of financing led by the corporate venture group at Sony. The Keyhole vision and opportunity were compelling: a talented technical team, an “experienced” CEO, and the ability to configure and portray satellite imagery that previously had only been available in high-cost military and national defense applications. The main product EarthViewer\textsuperscript{3D} transformed satellite images and aerial photography into a videogame-like experience. Later, they created a platform to add location-specific data, mapping boundaries, yellow page listings and address information. “Our goal is simple: to put the entire world in the hands of our customers,” said Hanke in a 2001 press release.

But no matter how attractive the opportunity, the macro venture capital environment soon radically changed, leading to difficult times. Shortly after the initial funding, the investment bubble burst and the venture capital community was in triage mode. Due to Keyhole’s dwindling working capital and large operating budget, Hanke faced some hard decisions. Progress slowed, spending was cut back, and simple survival became the top priority. Hanke recalled:

\textsuperscript{11} Bailey, op. cit.
\textsuperscript{12} Parts of this section taken from Engel and Forster, op. cit.
“Our business model [at Keyhole in 2000] was about 15 years ahead of its time—it was software as a service [SaaS]. We were one of the first people doing this. We created this massive database of Earth information, imagery map overlays, and lots of different data sets. We sold access to [Keyhole] on the monthly basis. Although we had originally started the company with the idea of that being a consumer company, where consumers would pay a [small fee] for the right to use it, the dot-com crash happened shortly after. We then pivoted to a B2B focus, selling [subscriptions] to engineering firms and real estate and land development companies, charging them hundreds to thousands of dollars per month to access the system.”

Regaining Momentum. Finally, in 2003, things began to turn their way. “It wasn’t long after the bombs began erupting in Iraq [with the Second Gulf War] that all heck broke loose at a two-year-old Silicon Valley startup called Keyhole,” wrote the San Jose Mercury News in 2003. NVIDIA, an early marketing partner, and In-Q-Tel, a relatively new funding source connected to the CIA, bridged the company’s financing while it regained momentum. After the Iraqi invasion, a host of news organizations reported on Keyhole’s new found popularity and exposure, a result of their mapping software being used to illuminate news forecasts on CNN, ABC, CBS, and various foreign news outlets. Gilman Louie, the founder and then-CEO of In-Q-Tel, remembered looking up Keyhole because of his Bay Area connections. Louie recalled:

“Keyhole wanted to map the world in 3D, but they couldn't really get anyone's attention without a real monetization model back then. However, John Gage, then the Chief Scientist at Sun Microsystems, suggested at a Christmas Party in 2002 that I take a look at them. The NGA (National Geospatial Intelligence Agency) and the CIA then had a need at the time to secure high-quality geospatial technology. I was blown away by what I first saw of Earthview 3D. Unlike those of other geospatial companies, Keyhole took a gamers’ approach to mapping. John and his team made their maps look good for the average user and these maps could be also easily accessed online through a browser. While Sergey (Brin) and Larry (Page) had this vision to organize the world's information on Google, John had this vision to map the entire world on a laptop through Keyhole. In-Q-Tel then decided to invest in Keyhole almost 30 days before the start of the Second Gulf War. It was interesting to see that the Earthview 3D maps being used by our intelligence analysts were the same ones appearing on the major television news networks in their reporting of the War, as the media companies had also licensed the Keyhole technology.”

Acquisition by Google. With so much global exposure and the recovery of the venture capital climate, Keyhole was able to line up several interested investors in mid-summer 2004. Just as Hanke was closing the terms for a substantial Series B venture capital-led financing round, Google called. At the time, relatively little was known about Google; its initial public offering had not yet happened, and Google had been very secretive about its financial performance. Hanke was wary of Google, particularly because he was very close to committing to his next round of financing. However he did take the time to demonstrate the technology to a business development manager at Google, which was located only a few blocks from Keyhole’s Mountain View office.

Less than a day after the EarthViewer presentation, Google offered to buy Keyhole. Hanke was faced with a major decision. The founding team was reticent; they were attached to their vision for EarthViewer. Yet the opportunity to leverage Google’s vast and rapidly growing user base was appealing. Although the ultimate value of the acquisition was not fully apparent—Google
was still pre-IPO and its success and the ultimate value of its stock was not assured. In the final analysis, the opportunity offered to see their vision come to maturity as part of Google was just too good to pass up.

**Google ‘Geo’ Products**

The acquisition by Google proved a breakthrough. Hanke and all of his 30 Keyhole employees stayed on board after the “spin-in.” Able to leverage Google’s world-class engineering talent and financial resources, they made tremendous progress. When Google bought Keyhole, the high-resolution imagery in EarthViewer was not available in some cities and other parts of the world, and the application was expensive. In 2002, the pricing of a Keyhole annual subscription was $1,200 per user. Once inside Google, Hanke and his team were no longer limited by the need to generate near-term cash flow. Google immediately lowered the price of the consumer version to under $30, and when Google Earth launched in June 2005 the software was made available for free. The acquisition was also a great strategic match for Google. The geo-products synched well with Google’s simple strategic vision: organizing the world’s information, improving search capabilities for that information, and making that information free. EarthViewer now rebranded as Google Earth, as fully manifested through Google’s platform, brought a whole new dimension of information to Google’s offering. Hanke noted:

> “Google's all about organizing the world's information and making it useful. You can search text and you can do that great with the algorithms that Larry and Sergey originally created. That was the original core competency of the company. But [Larry and Sergey] were also looking at all the other domains of data, ways to organize that data, search for that data, and make that data useful to people. They had started maps, then searching for things on top of the map, and then all the data that is related to the earth and geography. [Geo] was a domain that they felt would be [ultimately] important to Google and they wanted to be good at it. So they bought us, and poured in a lot of capital.”

The subsequent unleashing of even more vast amounts of free information, combined with the subsequent rise of the smart phone with its GPS capabilities and mobile location-based applications, was more than fortuitous. Application developers, large and small, were often driven by communities of users, all owed a great deal to the early Keyhole vision and the Google platform that helped build it on a global scale.

**Integration within Google.** Google’s capacity to integrate the Keyhole team without destroying its ability to operate with entrepreneurial agility was vital. Shortly after the acquisition, there was a high-level discussion at Google on how the Keyhole team should be integrated into the company. The decision to keep Keyhole as an independent unit within Google proved critical. Hanke recalled:

> We had this initial meeting with the consulting types and other aspiring business leaders on how Keyhole should be folded in Google. Then, one of their most senior and most experienced executives, Wayne Rosen, the vice president of engineering, spoke up and said, “Leave these people alone. They know what

13 Parts of this section taken from Engel and Forster, op. cit.
14 Over time, the work done by Google geo-products team also helped improved the geo-targeting of Google’s online advertisements.
they’re doing. They’re going to do great stuff. We brought them to do great stuff. Let them do that.\textsuperscript{15}

**Scaling Up Quickly.** The old Keyhole and the new “Keyhole-within- Google” operated at different orders of magnitude. For example, early in his career at Google, Hanke talked to Brin about a licensing deal to obtain more satellite imagery, expecting to buy a small portion of what was available. Brin authorized purchasing everything the vendor could possibly offer. The acquisition by Google was truly a transformative experience for Hanke and the Keyhole team. Before Google, being an entrepreneur at Keyhole meant creating a product at a managed scale and pursuing opportunities in relatively small increments. Now Hanke went from thinking about city-by-city rollout to thinking about the whole world. In many ways, Google Earth remained true to the Keyhole vision, but what it achieved was on a much grander scale and ultimately integrated with many other products and features such as Google Maps, Local, and Street View. Hanke learned to appreciate the luxury of operating at “Google Scale.” He recollected:

> Things went beyond my wildest expectations of what our technology could become. To fully exploit it, we needed the full resources of Google. We needed the server infrastructure, we needed the additional engineers, and we needed their resources to fill our product imagery. When we wanted to partner with Digital Globe [the satellite image vendor] to get the highest possible resolution, Sergey said “get every useable pixel.”\textsuperscript{16}

**Lean Innovation.** While overseeing Google Geo, Hanke and his team often prototyped, improvised, and tested quickly. After years of looking at overhead images of specific locations, the idea for Street View emerged when Brin asked why the Google “couldn’t also capture imagery the way people saw it—from the ground.”\textsuperscript{17} The Geo-team then went out, hired contractors, and placed GPS cameras on top of cars, with the mandate to take images of every street angle possible. Anthony Levandowski, one of the Google software engineers on the Geo team, noted that following the principles of “having a laser focus, pursuing ‘rapid turnarounds,’ and maintaining a ‘just do it’ attitude” were keys to creating innovative products.\textsuperscript{18} Levandowski recalled that the team initially didn’t have the resources to make things happen quickly in order to scale up Street View, so they improvised:

> [We only had this one car that we were driving manually with a GPS camera to take the images]. We came to the realization that this one car wasn’t going fast enough and we needed to duplicate it...We were short of money and decided that rental cars were cheap—you can rent them by the month for couple hundred of bucks—[so we used rental cars instead. We then built wooden racks to place the cameras on top] and then hired people off Craigslist, saying that we needed “professional tourists.” We would pay them each $10 per hour to “tour” and we then pushed this idea forward. [With the GPS cameras on top of the cars, we

\textsuperscript{15} John Hanke, Berkeley-Haas August 27, 2009 presentation, YouTube, “Innovation at Scale: Google,” https://www.youtube.com/watch?v=6NrzvMoxn2E


\textsuperscript{18} Anthony Levandowski, Berkeley-Haas, August 27, 2009 presentation, YouTube, “Innovation at Scale: Google,” https://www.youtube.com/watch?v=6NrzvMoxn2E
began to take images that we needed. The car rental agencies also got back cars with bald tires and a few dents], but you got to take risks to get the job done.19

Crowd-Sourced Open Innovation. Another key to the Geo’s ability to scale up new products quickly was that Google followed a “crowd-sourced open innovation” concept where the public could help make enhancements to all of their online offerings. For example, when Google was expanding internationally, it relied on its users to translate its pages into the local languages, without having to hire professor interpreters.20 Later, Google would open its Android operating system on smart phones to outside developers. Similarly, at Geo, a tool called “Map Maker” was created, as Eric Schmidt and Jonathan Rosenberg wrote in “How Google Works”:

When our Geo team set out to chart the world’s geography, they discovered that for a good many areas good maps simply didn’t exist. They created Map Maker, which lets anyone contribute to Google Maps. Live on a street that doesn’t show up on the Map? No problem: Just draw a line in and we’ll add it in (after we make sure that it’s actually there). Thus was built a new community of grassroots citizen cartographers, who made it so that the maps of entire cites were just a mouse-click way for our users. For example, they mapped over twenty-five thousand kilometers of roads in Pakistan in just two months.21

Today, Google’s maps products form a platform that more than one million sites and app developers have used to build businesses, serving more than one billion users each week.22 These GPS-based businesses include Uber, Lyft, Airbnb, Yelp, Waze, and Open Table. Hanke observed:

A lot goes back to Google and its founders’ decision to really invest in a large amount of geographic data and putting it on the Web very freely. [The founders had also decided to make] Google Maps APIs23 [openly available] where anybody can go out and build a company and a product on top of the data. Most other companies would have bundled and charged for this. By enriching the Web, Google believed that [the company] would benefit in some broad way.24

On his experience in building the Geo division, Hanke reflected:

“[Google Geo] was like a post-doc business education—scaling up with everything was growing like crazy within Google at that time. Teams were growing, our business was growing, we wanted to do things quickly, so it was a tremendous amount of fun. It was very, very rewarding.”

Niantic Labs

Building Niantic Labs within Google. After overseeing the Google Geo Division—now

21 Ibid.
22 Bock, op. cit., p. 37.
23 API is an acronym for “Application Programming Interface,” which enables other applications to interface with it (source).
numbering nearly 2,000 “Googlers”—Hanke rekindled his entrepreneurial and gaming interests in 2010, by starting up a “skunkworks”-type project within Google called Niantic Labs—named after a whaling ship that was grounded and abandoned in San Francisco when its crew joined the 1849 Gold Rush. Hanke explained the rationale for taking on Niantic Labs, whose mandate for its 30-some employees was to find new opportunities for Google where mobile, geo-based maps, social, and gaming trends converged:

“I had been leading the geo content part of Google for about six years and I eventually became interested in what we could do with our investment in mapping technology in the mobile space. Anything that we were doing with Niantic [was] based around location services and mobile phones.”

He also added:

“I [also] wanted to be more directly involved in product development and the creation process [again]. When organizational size and layers of management come into play, it’s harder to directly influence what you’re working on. So I talked with my colleagues at Google and they said, ‘We’d like to find a way for you to do this inside of Google.’”

For Hanke, Niantic also tied together mapping and gaming, his two most important work passions. He noted:

“I had taken an hiatus from games for a long time, but the latest stuff that I’ve been working on the past [few] years [at Niantic] took the work that Google’s been doing in mapping and combined it with games.”

Field Trip. At Niantic Labs, two location-based app products were created. The first was Field Trip. Launched in early 2012, it was built around an early version of Google Glass. Hanke noted:

“We launched a product called Field Trip. It’s about information discovery. We ultimately incorporated over 300 publishing partners into that and, [Field Trip] surfaces information about the world as you’re out moving around, [similar to] the story about the Niantic ship. [Field Trip] basically tells you about stuff that's around you. So it could be information about a bar, art, architecture, or shopping. [The publishing partners] that we signed on were to basically funnel content to that. We were trying to predict the future and were looking at [AR] trends with Google Glass. We all know how that [initial experiment with Google Glass] went. So, maybe that’s the trend lesson: you have a fundamental trend that may be valid, but they’re going to be fits and starts along the way and maybe that was one of them.”

Ingress. The second product was Ingress, a location-based MMOG that launched in late 2012. Ingress has been described by its players as being “a giant game of capture the flag, where you play a video game, but in real life” or “being like Four Square meets geo-caching meets a giant game of Risk, where the board is like the surface of the earth” and “you actually have to go out in

25 Bailey, op. cit.
26 Bailey, op. cit.
the real world to play the game.”27 Under Ingress, players could choose to be “an agent” on one of two teams—The Resistance or The Enlightened—with the mission to seek out and virtually take over physical landmarks labeled as “Portals” for their teams by using a smart phone app. When eight team members designate their resonators onto a specific portal through their individual smart phones, they secure the portal for their team. Hanke explained the concept.

“We basically took the concept of an MMO-type game where you have millions of people all collectively participating in a massive game that goes on forever. We took it out from the computer, and basically just broke it out into the real world [with a mobile device]. It's very similar to the MMO stuff that we were doing way back [when Meridian 59 was launched].”

**Design Rules.** In designing Ingress, the Niantic team followed four basic design rules: 1) The World is the Map; 2) Move to Play; 3) Urban Exploration; and 4) Social.28

By making “The World is the Map,” the Niantic team did not want to limit the games’ scope to a select few geographic locations. They wanted to have players from all around the world in order to scale up the game’s popularity. By requiring participants “Move to Play”, Hanke—an outdoor enthusiast himself—and his team wanted typical video gamers to get away from being in front of a screen and seek some exercise while playing. By creating an “Urban Exploration” aspect to the game, the Niantic team wanted participants to have a learning aspect by playing. And by “Social,” the MMO aspects of the game allowed players to meet others in the real world.

**Synergies with Google.** Individual Ingress players could also create individual Google+ pages to share with other participants and a weekly Ingress Report on YouTube provided all players on Ingress activities worldwide. As of February 2014, there were 1.78 million Ingress players who had created Google+ pages and there were 5,000 local Google+ communities centered on Ingress.29 As Hanke noted at a video gaming conference about Ingress’s tie-in with Google’s products:

The next step is to take this concept of Google as an entertainment platform and help people more fully utilize it. What we did with Ingress, using Google+ as a storytelling mechanism, YouTube as a mechanism to provide video content about the environment, and Google Play as a way to get books and comic books out there. [This platform was then used] in conjunction with gamers to really create an environment where people can really live in not just for a few hours when they play the game but to engage the community over days, weeks, and years.30

Although fairly independent inside of Google, Niantic had access to all of the company’s resources. Hanke commented:

Niantic is able to move pretty autonomously and quickly, but we’re still able to tap into other groups at the company and build on the relationships and data and infrastructure that we have at Google.31

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27 Playing Ingress, YouTube, https://www.youtube.com/watch?v=Y6-JAm3NCAk
29 Ibid.
30 Ibid.
31 Bailey, op. cit.
Being part of Google also allowed Niantic to uniquely test their games among a global group of highly talented employees. Hanke explained:

“We leveraged the fact that [Niantic was] within Google. We had this long internal beta test with Google’s then—40,000 employees around the world to whom we were iteratively releasing versions of the software. It’s a game that geeks really like…There were people in Zürich and Tokyo and Berlin and Cape Town who are Google employees that sort of helped spread the word. We also relied heavily on public relations. [Ingress is] a truly novel thing. [Ingress] wasn't an imitation of anything else, so that's always an advantage to go out and talk to the press about something that's really new.”

A Game and a Platform. As Google did with its page translation, Google Maps, and Android, Niantic also followed an open innovation model at Niantic. Said Hanke in February 2014:

We like to see more games like this getting built. To facilitate that, we’re making the technology that we used to create Ingress and turning that into a set of APIs, so that other people can build experiences like this. We will be working with a small number of developers [in 2014] to create new experiences and to make the APIs more available [in 2015].

Cluster of Innovation: Silicon Valley

As an entrepreneur, Hanke’s career benefitted from the Silicon Valley’s ecosystem as he intersected with different key components at different points in his career. A description of the Silicon Valley’s ecosystem as seen through a “Cluster of Innovation” (COI) lens follows.

A global “hot spot.” COIs are global economic “hot spots” where new technologies germinate at an astounding rate and where pools of capital, expertise, and talent foster the new ways of doing business. They are vibrant, effervescent, ecosystems composed of startups, businesses that support the startup process, and mature enterprises (many of whom evolved from rapidly from a startup history). In these ecosystems, resources of people, capital, and know-how are fluidly mobile and the pace of transactions is driven by a relentless pursuit of opportunity, staged financing, and short business model cycles.

In California’s Silicon Valley, the archetype of such a cluster, several key components define these aggregations: universities, government, entrepreneurs, venture capital investors, mature corporations, R&D centers, and specialized service providers and management (Exhibit 6). They are also distinguished by key behaviors that favor the development of high-potential entrepreneurial ventures: a high mobility of resources (principally people, capital, and information—including intellectual property); an entrepreneurial process (the relentless pursuit of opportunity without regard for resource limitations); increased velocity of business development; a strategic global perspective; a culture of alignment of interests and transaction structures that reinforced that alignment; incentives and goals that lead to an affinity for collaboration; and development of global ties and bonds.

**Key COI Components.** Three components—universities, government, and entrepreneurs—played key historic roles in the transformation of the Silicon Valley from a small agricultural valley into the global powerhouse of invention and business creation that now extends north into San Francisco and the East Bay corridor.

*Universities.* Major universities, such as the University of California at Berkeley, the University of California at San Francisco, and Stanford University, were the sources of new technologies and inventions. Universities supported commercialization of technology with entrepreneurship education, incubators, and seed funding. For example, at Berkeley, between 1988 and 2012, there were 140 startups from university inventions, including 65 funded at an average of $13.8 million dollars each. At Stanford, between 2006 and 2012, there were 8,961 patents and 2,770 spin-off companies. In addition, there were 30 other colleges and universities in the San Francisco Bay Area that provided an ongoing pool of talent.

*Government.* Immediately before World War II and during the Cold War decades afterwards, military contracts provided contracts at Stanford that led to the growth of pillar Silicon Valley companies such as Hewlett-Packard, Varian, and Lockheed Missiles and Space. This provided the foundation for a future techno-centric innovation cluster. In addition, ongoing federally funded research labs, such as the Berkeley National Laboratory, played a central role in ongoing interdisciplinary research. Finally, government policies, such as the Bayh-Dole Act of 1980, gave invention ownership to universities instead of government, fostering spin-offs from government-sponsored research.

*Entrepreneurs.* The work force is not only highly educated and technically skilled, but extremely innovative and entrepreneurial. For example, in 2010, the ZIP code 95054—the suburban city of Santa Clara in the heart of the Silicon Valley—produced the most industrial patents of any zip code in the U.S. With over 20,000 patents, this zip code would be ranked 17th compared to all the nations globally. Startups, and the entrepreneurs that drive them, are often highlighted in popular culture. Apple (Steve Jobs and Steve Wozniak), Google (Page and Brin), and Facebook (Mark Zuckerberg) have become cultural icons. This entrepreneurial spirit evolved from California’s Gold Rush Days, when adventurous individuals turned their attention to other enterprises in the Bay Area. What differentiated these adventurous individuals was their willingness to take big risk in return for big gains. Silicon Valley entrepreneurs seek potential upsides and are willing to use outside equity financing in pursuit of these gains, even though it may come at the high price of diluted control over their ventures.

**Other Significant COI Components.** In addition, four other significant COI components—venture capital, mature corporations, industrial research centers, and service providers and management—evolved in the Silicon Valley as it developed.35

*Venture Capital.* Investments in the early Silicon Valley startups, such as Shockley Semiconductor Labs and Fairchild Semiconductor, were provided by operating corporations, not investment firms. With the first IPOs of the Silicon Valley startups—Varian in 1956, Hewlett-Packard in 1957, and Ampex in 1958—professional venture capital firms appeared, investing their own capital in early-stage companies as well as funds from large institutional investors, such as pension funds. Venture capital investors have provided critical capital to nascent companies—

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in the last decade VC investment in the U.S. has been $26 billion to $30 billion with one-third invested regularly invested in Silicon Valley. In 2013, the Silicon Valley accounted for 40 percent of all the venture capital spending in the top 100 U.S. cities (Exhibit 7).

**Mature Corporations.** Many of Silicon Valley’s best-known global enterprises (such as Intel, Apple, Cisco, Google, and Genentech) are recently birthed entrepreneurial firms that recognized the benefits of collaborating with emerging firms. Collaboration between mature corporations and startups can take many forms, from simple contractual agreements to equity investments, partnerships, and acquisitions.

**Industrial Research Centers.** As Silicon Valley expanded, so did the bounty of research centers. In addition to federally funded research labs, many major corporations also created research and development (R&D) centers either because they were headquartered in the Valley (like Hewlett-Packard or Cisco) or because they wanted their researchers closer to the center of innovation (like IBM, Xerox, and Samsung). This trends continued with the recent imports, including Wal-Mart and Baidu research center. Other independent R&D centers spun out of university relationships, such as the Stanford Research Institute (SRI). In addition to providing the Valley with a deep reservoir of top technical talent, these centers spark new ventures as engineers and scientists seek entrepreneurial outlets for themselves and their projects.

**Service Providers and Management.** The needs of large numbers of cash-starved, high-potential startups led to the development of specialized providers (such as lawyers, accountants, design professionals, recruiting firms, investment bankers, incubators, and accelerators) who not only provided tailored professional services, but also were willing to discount or defer fees, often in exchange for a small share in the venture’s eventual returns. Similarly, a professional entrepreneur management class evolved to enable the rapid scaling of young ventures. These managers are highly regarded individuals who specialize in working with startups of a certain size or stage where their functional expertise (i.e., product development, finance, engineering, sales, and marketing) is primary, with industry-specific experience secondary.

**Moore’s Law.** A principal—and underlying—driver of technological innovation in the Silicon Valley and worldwide over the last 50 years has been the ever-increasing power of the computer microprocessor, a phenomenon that has now become known as Moore’s Law. Named for the co-founder of Intel who first observed this trend, Gordon Moore had predicted in 1965 that the calculating power of a computer microprocessor would double every 12 months for the next 10 years. Ten years later his prediction had held true. Moore then forecasted in 1975 that the doubling would occur every two years for the next 10 years through 1985. In the late 1980s, Moore again estimated that this doubling would occur every two years for another decade. Over a half-century, Moore’s Law still held (Exhibit 8). This increased power of microprocessors over the last five decades has led to its evolution from integrated circuits to the personal computer, the internet and mobile devices (Exhibit 9), and the emergence of several innovative and disruptive high-tech companies.

**Looking Ahead**

As the bumper-to-bumper traffic on Interstate 880 began to open-up as Hanke neared his destination, his thoughts began to crystallize about the advantages or disadvantages of doing a spinout. He could keep Niantic Labs within Google and not have to worry about building a new

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infrastructure for overhead, which would include real estate, information technology, legal, and accounting. Staying put would allow Niantic to continue to benefit from the Google brand name, synergies between its online products, and the support from its world-class engineering team. Also, funding would not be issue if Niantic Labs stayed within the Google family. In this case, Niantic Labs would be one of Google’s many “moonshot” businesses that Google CEO Larry Page said the company was investing in to create “real” change:

It’s also true that many companies get comfortable doing what they have always done, with a few incremental changes. This kind of incrementalism leads to irrelevance over time, especially in technology, because changes tend to be revolutionary not evolutionary. So you need to force yourself to place big bets on the future. It’s why we invest in areas that may seem wildly speculative, such as self-driving cars or a balloon-powered Internet. While it’s hard to imagine now, when we started Google Maps, people thought that our goal of mapping the entire world, including photographing every street, would prove impossible. So if the past is any indicator of our future, today’s big bets won’t seem so wild in a few years’ time.

But if Hanke chose the more challenging route of having Niantic Labs become a separate company, there would be the benefits of not being restricted to Google’s core brand and strategy over the long-run—especially since the company had followed a “70/20/10 rule,” where 70 percent of Google’s resources would be dedicated to existing core businesses; 20 percent, emerging businesses; and 10 percent, new businesses. A stand-alone Niantic company—echoing Hanke’s days as an entrepreneur prior to Google—would require him and his management team to scale-up the company almost from scratch. These tasks would involve negotiating with Google on the exit price of a possible spin-out, determining the IP rights for Ingress and other properties, building a new executive and engineering team, raising capital from outside investors, and identifying the optimal post-spinout ownership and governance structure.

No matter which option Niantic pursued, Hanke believed the gaming industry was at the brink of a strategic inflection point, with the emergence of both AR and VR, that was a tremendous. He noted:

“There’s a market disruption going on. The traditional gaming console business, which is based in every living room, has seen a lot of that money moved over to mobile—like tens of billions of dollars. That money continues to flow from the traditional game industry to the mobile world. People are now looking for the evolution beyond the mobile phone and tablet. VR and AR are the next major set of technologies that are coming.”

37 Schmidt and Rosenberg, op. cit., page xiv.
38 Ibid.
39 Schmidt and Rosenberg, op. cit., page 223.
Discussion Questions

1. Google’s acquisition of Keyhole:
   - What did Keyhole and its investors sacrifice by being acquired? What did they gain? Was it worth it? Why?
   - What did John Hanke take away from this acquisition experience?
   - What helped Keyhole to become a successful acquisition?
   - Why was it deemed a success?
   - What KPIs would you use to measure this acquisition?

2. Niantic Labs spin-off from Google’s point of view:
   - Should Google spinout Niantic Labs? Why?
   - What should Google do to make it success for Niantic and Google?
   - What are the KPIs for the spin-off?

3. From Hanke’s and the Niantic Lab team’s point of view:
   - Is Niantic Labs better off inside or outside of Google? Why?
   - What are the KPIs for Niantic Labs as a stand-alone entity?

4. Cluster of Innovation: The Impact of Time and Place:
   - When John Hanke decided to pivot his career back to computers and gaming, he made a strategic choice to a) go to a business school and b) to choose a school proximate to a Cluster of Innovation. How did his career benefit from that choice?
   - How did John Hanke’s understanding of geographic information systems and its applications aid in the creation of Keyhole, Google Geo-products, and Niantic?

5. Cluster of Innovation: Looking Forward:
   - What role does the Silicon Valley ecosystem play in the decision making?
   - How would this decision be affected if Niantic Labs was located elsewhere?
   - What strategies should Google and Niantic each adopt to take advantage of their geographic location?
   - What strategies would you adopt if you were the CEO of Keyhole, and it was located in __________ (fill in the blank with your location)
Exhibit 1 The Google Universe

Exhibit 2 Key Milestones in John Hanke’s Career

1967  Born in Cross Plains, Texas
1980  Self-teaches himself coding while in junior high school
1985  Enters the University of Texas at Austin
1988  Chairs the Distinguished Speakers Series at UT
1989  Graduates from University of Texas with honors
Enters the U.S. State Department’s foreign service
1994  Enters the MBA program at the Haas School of Business at the University of California at
Berkeley
Begins his first startup, Archetype Interactive, with fellow Berkeley-Haas MBA student,
Steve Sellers, in the basement of the Bancroft Hotel as part of the Haas School’s
entrepreneurial lab
1996  Graduates with a MBA from Berkeley-Haas
Sells Archetype Interactive on graduation day to Trip Hawkings and 3DO
1998  Starts his second startup, the Big Network
1999  Sells the Big Network
1999  Purchases Keyhole technology from Intrinsic Labs
2004  Google’s IPO
Keyhole is purchased by Google
Becomes Google’s vice president for product development, Geo-products
2005  Keyhole rebranded as Google Earth
2005  Google Maps launched
Panoramio acquired
2007  Google Street View launched
2010  Creates Niantic Labs within Google
2012  Niantic Labs launches Field Trip
Niantic Labs launches Ingress
2013  First Ingress XM Anomaly takes place in Europe. Primary sites include Hamburg, Germany;
Oslo, Norway; Copenhagen, Denmark; Helsinki, Finland; Moscow, Russia; and St.
Petersburg, Russia.
2015  Considers spinning Niantic Labs out of Google

Source: Published sources, Linked-In.
**Exhibit 3a** Augmented Reality and Virtual Reality: Worldwide Revenue Projections (2016-2020)


**Exhibit 3b** Augmented Reality 2020 Worldwide Revenue Breakdown

**Exhibit 4a Augmented versus Virtual Reality**

![Augmented versus Virtual Reality Diagram](Image)

*BHCS diagram. Source: Yesshare.com*

**Exhibit 4b Augmented Reality Timeline**

![Augmented Reality Timeline](Image)

*BHCS diagram. Source: Crystalinks.com*
Exhibit 5a Geographic Information Systems: Multi-Layers

Source: Henrico County, Virginia, GIS information page. Public domain use.

Exhibit 5b Geographic Information Systems: Evolution

BHCS diagram. Source: “Innovation Drives GIS Evolution”
http://www.innovativegis.com/basis/MapAnalysis/Topic27/Topic27.htm
Exhibit 6 Cluster of Innovation

Components of a Cluster of Innovation

Source: Developed by author, 2016.
Exhibit 7 Top Cities in the U.S. for Venture Capital Investment (2013)

1. San Francisco-Oakland: $6.896 billion (25.6% of the top 100 cities)
2. San Jose-Sunnyvale: $3.985 billion (14.8%)
3. Boston: $3.101 billion (11.5%)
4. New York City: $2.269 billion (8.4%)
5. Los Angeles: $1.677 billion (6.2%)
6. San Diego: $1.134 billion (4.2%)
7. Seattle: $886 million (3.3%)
8. Austin: $626 million (2.3%)
9. Chicago: $547 million (2.0%)
10. Washington, D.C.: $484 million (1.8%)
11. Philadelphia: $347 million (1.3%)
12. Denver: $264 million (1.0%)
13. Atlanta: $262 million (1.0%)
14. Boulder, Colo.: $256 million (1.0%)
15. Minneapolis-St. Paul: $256 million (0.9%)
16. Santa Barbara, Calif.: $251 million (0.9%)
17. Phoenix: $214 million (0.8%)
18. Raleigh-Cary, N.C.: $184 million (0.7%)
19. Pittsburgh: $167 million (0.6%)
20. Provo-Orem, Utah: $162 million (0.6%)

Exhibit 8 Moore’s Law

Microprocessor Transistor Counts 1971-2011 & Moore’s Law
40 years of disruption - and still going.

Note: Curve shows transistor count doubling every two years.

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Exhibit 9 Eras of Technological Innovation

BHCS diagram. Source: Developed by the author, 2016