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Cloudera: "Chase Interesting"

In my career, I've always chosen to work on what looked interesting. I've never said what my career development ought to be - I've always chosen interesting and things have worked out well. And this is just one of those instances. There was a chance to do something interesting that I had very little experience in, and it looked fun.

— Mike Olson, cofounder, former CEO, and current CSO of Cloudera

Mike and I sit side-by-side at the end of a long hallway… we are like an airline ticket counter. We want the company to see that we are a team together… I think this company would be nowhere where it is today if Mike had left.

— Tom Reilly, current CEO of Cloudera

Headquartered in Palo Alto, California with 26+ offices worldwide, Cloudera is a 1,600-employee software company that provides Apache Hadoop-based software and associated support, services, and training to business customers. In the 2015 fiscal year, Cloudera became the second company structured around open-source software to achieve an excess of $100 million in annual revenues. Founded by four technology experts in their respective fields, Cloudera and its story since inception provide valuable insight into the spearheading of a new industry with an innovative business model.

Mike Olson

Born and raised in Kansas City, Missouri, Olson was first exposed to computers when his stepfather bought an Apple II personal computer — serial number 125 — built by Jobs and Wozniak in the garage where they fomented their brand. A "geek", as Olson describes him, his stepfather worked at a research institute and was a member of the Kansas City computer club. While Olson initially used the computer to play games, he quickly discovered that it could be used to write programs. This developed as a passion of his throughout adolescence, in which he spent much of his high school years writing games in BASIC and learning 6502 Assembly. His interest in programming led him to attend computer camp in Columbia, Missouri. By the time he finished high school, he was quite confident that he wanted to pursue computer science in college.

Hoping to gain new experiences far from home, Olson went on to study computer science at the University of California, Berkeley in 1979. In order to garner some extra funds towards tuition,

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Olson picked up a part-time job working for the Computer Systems Research Group on campus. There, he worked alongside influential figures such as Bill Joy, then a graduate student, and his professor Bob Fabry, who were working on Berkeley Unix at the time. Olson says he would go into the office when no one was around and "just write code."

Although his part-time gig was a good fit, Olson quickly encountered adversity in his studies despite his technical experience and natural aptitude. He found himself falling behind in courses and unable to complete problem sets. Prior to attending university, he had always been able to stand out without displaying copious efforts and had therefore never truly learned the discipline of working. At Berkeley, Olson realized he was no longer the smartest kid in the room and that he would really have to apply himself if he wanted to excel. This resulted in, as Olson says, "B's, C's, and a D or two" during his first couple of years at Berkeley.

A Not-So-Brief Detour

In the summer of 1982, Olson decided to go to Europe for some adventures with the hope of returning at the end of the summer as a more diligent student. His first stop was Amsterdam, where he picked up odd jobs in local bars and restaurants, even working as a line cook in a Mexican restaurant. Olson enjoyed himself so much that one summer abroad turned into four years in Europe and the Middle East. But in late 1985, Olson decided that he'd had enough fun and it was time to go back to the states.

Olson returned to his parents' home in Kansas City and found a job automating billing procedures for a hospital health services company. It was also during this time that Olson met his girlfriend and future wife.

Shortly thereafter, Olson went to Berkeley to visit some of his friends from school. During this visit, he received a job offer to work for Britton Lee, a database company. After convincing his girlfriend to come with him, the couple moved to Berkeley and Olson began work under Paula Hawthorn, who pushed Olson to finish his degree from Berkeley. Surprisingly to him, Olson now knew how to apply himself, and the years off seemed to have done their job. He finished his undergraduate degree in computer science in 1991 and master's degree in electrical engineering and computer science in 1993.

Paula's former PhD advisor Mike Stonebraker had been working on the Postgres project at the time. Utilizing this connection, she procured Olson a job on Stonebreaker's research team. Stonebraker then recruited the rest of the research team to his company Illustra, which brought to market a commercialized version of the Postgres object-relational database management system. Olson was a year into his PhD program in database management systems under Stonebraker's encouragement, but discovered his lack of interest in research and left his PhD program to join the Illustra team.

Illustra had issues selling their software as many of the sales people did not fully understand the functionality of the technology. Olson was older than most of the engineers at the company with more diverse experiences and a stronger ability to communicate with people. Recognizing this, the sales people began inviting him to join their sales calls and he would answer all of their technical questions, which led him to take up a role as a "sales engineer."

As a sales engineer, Olson had the opportunity to hear about the interesting problems customers were facing and figure out how he could use the technology to solve them. Over time, Olson

became less responsible for developing software and more responsible for supporting sales processes, coordinating marketing strategy and writing documentation for the functionality of the software. In early 1996, Illustra was acquired by Informix and Olson was put in a managerial role on the business side. He enjoyed it for some time but did not like the large-company culture, so he left to join a smaller biotech company in Palo Alto, Molecular Application Group, as VP of Engineering. In addition to having personality differences with the CEO, Olson realized he did not understand the science well enough to excel in the role and left the company a short year later.

Olson then decided to take some time off to focus on his family. During this time, Margot Seltzer, Olson's old classmate with whom he worked on Berkeley DB, reached out to him about an open-source company she started called Sleepycat Software. Seltzer offered Olson a job in sales, and convinced Olson to become Sleepycat's first full-time employee in 1998. By 2003, the company had acquired fast growth, but still did not have a formal CEO — Olson volunteered to step into the role. In early 2006, Olson sold Sleepycat to Oracle and took on the role of VP of Embedded Technologies at Oracle for two more years.

Olson had been involved in enterprise software and the database industry for his entire career up until he left Oracle. He recalled:

> "I was lucky in that we timed the sale of Sleepycat to Oracle in 2006 when it made sense for Sleepycat to get out. I had a two-year lockup. In 2008, I had been working in the database industry for twenty-four years, so it had been a long time, and I wanted to do something different. I had been competing against Larry Ellison (co-founder of Oracle) for all that time, until I finally showed that guy a company. It kinda sucked, he had a lot of money, and his product's really good. So I decided I was going to look at a different thing to work on."

Launching Cloudera

In early 2008 as Olson was searching for something new to work on, he attended an event at Facebook where Jeff Hammerbacher, the data team lead, gave a talk on Hadoop, an open-source framework used for distributed processing of large datasets across computer clusters. Big data and cloud computing were novel concepts to Olson, who had a background in relational databases. However, it did not take long for him to identify this as his next endeavor.

Olson was familiar with building transaction processing systems for banks to satisfy their highest end demand. He recognized that Facebook was solving a dramatically different problem than what JPMorgan Chase was solving with relational databases. However, Facebook's problem involving handling data at scale was not unique — it would affect every industry being transformed by the internet, including the banks, hospitals, and insurance companies that ran on the relational database systems Olson built. Olson explained, "I was convinced that every large enterprise was going to have this data problem, and I'd done a lot of open-source software in my career. This open-source software was ideally designed."

Olson and Hammerbacher were not the only ones thinking about an open-source big data solution. Amr Awadallah, the Vice President of Product Intelligence Engineering at Yahoo, and Christophe Bisciglia, a senior software engineer at Google who founded Google's Academic Cloud Computing Initiative, also had similar aspirations. Hammerbacher and Awadallah were trying to hire from the same talent pool, and Olson and Bisciglia had met at an industry event in China a year previously. In August 2008, Olson convinced Hammerbacher, Awadallah, and Bisciglia to

consolidate as a team to start Cloudera rather than individually founding their own companies and competing against each other in the same space.

Although the four co-founders knew each other from being in the same industry, none of them had directly worked together before. There were tensions in defining roles initially since all of the co-founders came from technical backgrounds, each with a different skillset and expertise. Olson describes the initial dynamics as "a mess," stating that "everyone had the idea that they would be the one driving the technical direction of the business." It was, however, unanimously decided that Olson would be CEO as he was the most senior member and had experience as a CEO and in other managerial positions prior to Cloudera's inception. Olson posits that "four founders is just too many," and that this lack of evident division in roles is the main reason that all four founders did not remain with Cloudera indefinitely.

Product Development and Early-Stage Financing

In September 2008, in their office in Burlingame, California, the co-founders agreed on the strategy to bring Cloudera, an enterprise provider of open-source Hadoop-based software, to market, and decided to raise some venture capital to catalyze growth. They put together a pitch deck (**Exhibit 1**) and met with potential investors, one of whom was particularly interested in Cloudera's open-source Hadoop strategy: Ping Li of Accel Partners. Li was specifically interested in investing in enterprises built around Hadoop or similar technologies. Li explains, "Hadoop at that time was kind of gaining a lot of momentum in the community as the answer for some interesting problems, and the community was growing, it was becoming very popular."

Cloudera raised $5 million of Series A financing led by Accel on October 14th, 2008. In the weeks that followed, the stock market plummeted during the global financial crisis. For Cloudera, this was the perfect opportunity to grow and scale. With a fresh round of funding, Cloudera grabbed market share from companies that did not survive the economic downturn. Olson comments:

> "If we had started Cloudera two years earlier, enterprises wouldn't have been ready for this Hadoop software thing. If we started 2 years later, the big data was happening then, but it was obvious Hadoop was going to get commercialized by somebody. We were the only people talking about it in mid-2008. Our vision was clear, our strategic insight was right, but we just got super lucky on the timing. We hit the market exactly at the right time, and the global market crash was super helpful for us, because it gave us a free field and no competition for about a year and a half."

Due to the fortunate timing, finding enterprise clients early on was not too difficult for Cloudera. Large companies were looking to shed costs, so they were willing to take a chance with Cloudera. With few competitors in sight, Cloudera was determined to become the leading big data management platform.

In addition to good timing, the founding team was another key to Cloudera's initial success and a big reason why Accel made the investment. According to Li, the four co-founders were "the people that were living and breathing this problem, in some ways before the rest of the world really understood it. They had an intuition around it, Mike Olson who had a long history in the old world of databases, and you marry that with the newer approaches his co-founders grew up in, and so the team was just really unique in their understanding of the opportunity, and also they had a vision that was very bold."

Cloudera's co-founders focused their early hiring strategy on recruiting and retaining top technical talent. Olson mentioned, "we kept our bar really high, we always wanted to be an engineering company. And the trick is, if everybody on your team is A+, then all the other A+ players want to go there." Hammerbacher sourced from Quora, finding the people who asked the hardest questions and gave the best answers. Doug Cutting, the founder of Hadoop, left Yahoo, a leading innovator of search intelligence at the time, to join Cloudera on September 1, 2009.

Because of their unique, pioneering model and extremely talented co-founders, Cloudera received good press coverage early on that helped generate a huge amount of interest. In early 2009, an article was published about Cloudera in the *New York Times.* With the new spark in interest from investors, Olson met Aneel Bhusri, a partner at Greylock, co-founder and CEO of Workday, and a member of Intel's board of directors. Greylock led Cloudera's $6 million series B round on June 2, 2009, with continued participation from Accel. Olson notes, "that was the last time we ever raised money after spending the first dollar of the prior round."

Almost a year following the economic crisis, the market jump started again and Cloudera had not yet spent any of their Series B funding. On October 26, 2010, Cloudera raised a $25 million Series C funding round led by Meritech Capital – not because they were running out of money, but to satisfy one of their big banking customers who claimed that they were vulnerable to financial crisis.

Bisciglia and Hammerbacher eventually left the company, but the culture and vision of early Cloudera prevailed. Li, who stayed close to the co-founders as the company grew, mentions:

> "From the day one, all these founders had really big ambitions and really wanted to push harder to realize the company's potential to the fullest, and they were very open with each other, and also in many ways very tough on each other too in terms of pushing each other. I think they're permeated throughout the entire company from day one. I look at the top early hires they made and the hires they make now, there's always a "how do we do things better" mentality at Cloudera."

A Change in Leadership

By 2013, Cloudera had become quite a large company — with a 450-person staff and millions in revenue. Sales forecasting became very important as the company needed to develop a financial plan that pointed toward profitability.

At the time, Olson understood that tech companies benefit from a deeply technical CEO during the company's early stages but also recognized that Cloudera was approaching new grounds. Cloudera was entering a stage in which the accelerating growth of the company required a more operationally-focused CEO with a strong sales background. Olson had also began encountering an increasing number of CEO responsibilities that he disliked and felt he wasn't suited for. He had a decision to make about the future of Cloudera's leadership, as well as his role and impact at the company.

Eventually, Olson held discussion with Cloudera's board of directors about bringing in a new CEO. Quietly, the board and Olson began their search. They met Tom Reilly, former CEO of ArcSight, a company that also had a founding technical CEO for whom Reilly had taken over. Olson sensed that the board wanted to bring in new leadership and that, had he not initiated the discussions, the board would have done so themselves six months later.

Tom Reilly

Reilly attended the University of California, Berkeley from 1980 to 1985 and graduated with a Bachelor of Science in mechanical engineering. During his undergraduate years, he took two semesters off to participate in a co-op program at IBM. After graduation, he returned to IBM for two years to work as an engineer. He described the job as "lonely" – sitting in a room with a drafting table designing robotics and conveyor systems. Coincidentally, IBM was pushing a program they called "Back to The Field" where, in an effort to rebalance their resources, they actively encouraged more people in engineering to shift to sales. Reilly decided to make a big leap and become a sales representative. On the transition, Reilly comments:

> "That was a big change in my career because I went from being an introverted engineer to a sales person doing more extroverted things. I was fortunate to be assigned to a good early account, but the hardest thing was learning to be an extrovert. To this day I consider myself an introvert but a practiced extrovert."

Cloudera would be the third time Reilly would be brought on as CEO to a company that had founding CEOs change roles. He first did so at Trigo Technologies, which was an early-stage company with three founders all in their twenties. The founding CEO of Trigo Technologies took on a new role as Reilly took on CEO responsibilities from 2001 to 2004. Similarly, Reilly joined ArcSight and took the company public in September 2007, and it was later acquired by Hewlett-Packard in 2010 in a "crazy high valuation that was a tremendous outcome for everybody involved," as Reilly puts it.

Reilly talks about his track record of assuming CEO roles and how that has worked at Cloudera:

> "It is often rare that a technical founder will lead a company through all stages. I would never be good at being a founder of an early stage company. I would just flounder. It takes a unique skill to just believe in something — to go through all that grunge work, to then go raise your first money and get your first customers. If I can sit here and say, "I can't do that," I can equally well look at Mike and say "You did that very well," but you may not be setup to do something at a much later stage. So when Mike and the board agreed to recruit a CEO for the next stage of company, it wasn't because anything was wrong for Cloudera. It was for the next stage. And I suspect Mike was seeing things he didn't want to do or didn't enjoy doing, which are things I enjoy doing, right? So it's kind of that yin-yang."

Tom, Meet Cloudera

After leading the integration of ArcSight into HP following the acquisition, Reilly retired at the age of 50. A year into retirement, he received a phone call from a prominent Cloudera board member. Reilly answered the phone while vacationing with his wife in Lake Tahoe and enjoying a glass of champagne. As soon as it was mentioned that a CEO position was open at Cloudera, he put the phone to his chest, turned to his wife, and said "Stacy, I'm going back to work."

After "work-dating" Olson for three months and having conversations centered around Olson's vision for the company and how the two would work together, Reilly accepted the position and joined as CEO of Cloudera in 2013, under the condition that Olson stay committed to maintaining a key role at the company for the foreseeable future.

Reilly says of his initial goals at Cloudera:

> "I'll give you a theory I have. You don't need to come in and change everything to add value. The best thing is to add value in very small ways. Those little changes have big impacts, and I'm a big believer in that. You don't have to change the strategy. You don't have to replace the team."

Reilly wanted to create a more customer-centric culture at Cloudera, focusing on current customers before future customers. He asks for frequent reports on current customers and what they can do to improve their experience before thinking about how they're going to land their next customer. Aligning with this mission, Cloudera evaluates sales forecasts weekly in order to determine micro-adjustments that might improve outcomes.

New Dynamics

Reilly believes that companies belong to the founders – they imprint culture onto the company. Reilly says that "imprint means the culture and strategy – what I'll do as CEO is just one of the jobs." He leads Cloudera not with the philosophy that he will decide the direction the company goes, but rather the philosophy that his position as CEO can be distilled to the following: 1) ensuring that the company *has* a strategy, which he often leans towards the founders to really take ownership of, 2) clearly *communicating* that strategy to the customers and employees, and 3) knowing how to *measure progress* and executing on that plan.

Throughout his leadership, Reilly has made it a priority to develop a team that aligns by these three key points while ensuring that Olson and Awadallah are at the forefront: "I want them to be the brand and I'm happy to just be the CEO."

Regarding the change in leadership, Olson comments, "Tom is deeply gifted. A gifted CEO gets A+ behavior out of his A team by understanding the weaknesses and playing to the strengths and making sure that friction is identified and conflicts resolved."

Series F Investment

Throughout their lifetime, Cloudera had always been quite comfortable regarding capital. In early 2014, however, Cloudera was approached by Intel who was interested in having a hand in the Hadoop open-source project space. Reilly reflected:

> "Sometimes, you are confronted with situations and you may respond too quickly. So it may seem like "okay, I'm gonna go raise this money from Intel and let's go do that." No. Intel wanted to play in this space and that was confronted to me, and so I think Intel was looking at a buy versus partner type approach. We wanted to really jump in and tell them why partnering with us was a way for them to achieve their strategic objectives."

Olson and Reilly were all-in with the strategic offer Intel presented. Reilly had a strong understanding of how a business relationship with such an important client should be established as well as how the deal should be structured. Olson on the other hand, throughout his experience with big data management systems, knew the ins and outs of the technology at Intel. Reilly recalled: "What Intel does at the silicon chip level is very, very complex and how our software could be optimized for it is very, very complex, and Mike can run with that. And he did, and he spent time with their leadership and their engineers about how we can combine together, really optimize Intel architecture". This strategic partnership was the key reason Olson and Reilly were confident going into the deal.

With Cloudera fully on-board and Intel intent on the deal, the investment went through. On March 31, 2014, an agreement was made which involved Intel investing $740 million in exchange for 18% equity, thus equating to a total company valuation of $4.1 billion. The deal caused ripples throughout Silicon Valley, with many considering it to be a shockingly high valuation especially considering the fact that just two months prior, through traditional investment routes, Cloudera was "only" valued at $1.6 billion. Olson was unmoved, claiming that Cloudera has been influential contributing to the run-up of valuations of software industries especially in early stages. Reilly was also unsurprised. He mentioned:

> The company didn't change in the two-month period between Intel's Series F and the investments made by the traditional investors. What changed was the type of investment that was being made. So the professional financial investors, were investing at a rate that they expected to get a return on, and they all did extremely well. They just gave us some money, and we gave them some shares.
>
> Intel, on the other hand, did a strategic investment, and there was a lot of trading back and forth. Intel sits on our board and we commit to a collaborative roadmap where we have engineers working on optimizing their chip and they have engineers who work with our software engineers. We have go to market relationships, and how we sell together and market together.
>
> So it is a completely different investment thesis, and everyone got hung up on the valuation and not on the relationship and the partnership. So much like our financial investors were very happy, our strategic investors were also very happy, because they want to make sure that their architecture's optimized for this big analytic move, and it is. We've delivered on that. It was just different investment theses.

Reilly did admit, however, that strategic investments like these are very rare occurrences and that Cloudera's strong financial position did help them tremendously in being able to secure large investments and beneficial partnerships.

With the injected capital from Intel in place, Cloudera never had to raise capital through funding rounds again. Conditions were right for Cloudera to secure the position as the world's leading open-source cloud computing company.

Acquisitions

Inspiration

At the time, Intel had about 94% market share in the space of data center processing chips. That market leadership gave Intel near-perfect visibility of what was driving the acquisition of new chips and servers in data centers. This clairvoyance, in conjunction with Cloudera's cutting-edge software, allowed for greater profit margins in areas of technology that had previously been too expensive to pursue at scale. One such area is data encryption.

Encryption within the software industry had been traditionally costly. Unwilling to compromise the security of all data, Intel approached Cloudera about how their x86 chipset allowed for encryption in the hardware that would result in ten times the software performance. Olson and Reilly agreed to this proposition and promised to make that technology open-source so that every

company could take advantage of it. However, one issue remained: a key manager is required for this large-scale encryption plan.

Gazzang

Cloudera estimated that it would take six months to take the x86 technology into the open-source environment. In that time period, they went out in search for a key management encryption company. On June 2, 2014, they finalized the acquisition of Texas-based startup Gazzang. With this acquisition, Cloudera sent out a bold statement to their clients that they do not just believe in encrypting sensitive data, but *all* data. Their partnership with Intel would allow them to do so at reduced costs previously unheard of in the industry.

IPO

Cloudera Goes Public

The spring of 2017 sparked the revival of the IPO market as major tech companies like Snap and Blue Apron announced their decision to go public. Back at Cloudera, Olson and Reilly were discussing a potential IPO to be announced early in the summer. The motivation was straightforward: Olson and Reilly felt that shareholders and venture capitalists deserved a return on their investments. Reilly recalled:

> "The number one reason that we had to go public was that I inherited an obligation to our early venture capitalists, our early investors, and our early employees. And we had employees that had been here eight years, who, especially the early ones, weren't paid at market and took this piece of paper called stock that was worth nothing back then with the promise that it could be worth something. And they worked really hard, so I came in and said I'd rather be running it – it's a lot easier to run a private company – but that's not my choice. It's, you know, we need to get this return."

Olson and Reilly realized that taking Cloudera public would cause them to relinquish some control of the company, but it definitely had its advantages. An IPO would be a huge financing and brand marketing event as Olson and Reilly prepared to take Cloudera to the next stage. It would also instill a strong sense of transparency for Cloudera in the eyes of the market. Referencing the positives of being a public company, Reilly says:

> "There's a lot of transparency. And if your financials are very strong, as ours are, that transparency is very powerful when you're selling to companies. Because when you're a private company, buyers of technology are always worried about 'are you going to go out of business are you going to be acquired, and if you're gonna be acquired, who's gonna acquire you'. And the amount of times when we're a private company and the rumors are out there that Oracle's gonna buy us – once you go public that kind of all goes away."

On April 28, 2017, with J.P Morgan, Morgan Stanley, and Allen & Company LLC hired as lead underwriters, Cloudera announced the pricing of its IPO offering of 15,000,000 shares at $15/share, higher than the company's expectation of $12-$14/share when they filed for IPO in March. The IPO resulted in a $225,000,000 raise in financing for Cloudera and Cloudera also saw a 20% jump in its share price by the end of the day, up to $18.09/share.

Down Round

The IPO also placed Cloudera's public market valuation at $1.9 billion, a far cry from the $4.1 billion that Intel privately valued Cloudera at. Market analysts postulated that this may have been influenced by investors' bias and sentiments towards Hortonworks, a principal competitor in the Hadoop space, which had seen its share price slump by about 60% since its IPO in December 2014.

Furthermore, Cloudera was not a profitable business and this might have served as an indicator that led the public market to lower their valuation. Despite cutting losses from the previous fiscal year 2016, Cloudera was still considered by many to have a cash-burning business model. This, in addition to the fact that Hadoop was still in its very early stages of public market acceptance, could have contributed to Cloudera's reduced valuation.[1]

Reilly, however, is unfazed by the public's opinion. He says: "All of our financial investors are very happy with their returns. We are very excited with our valuation, and we are very excited with the receptivity to the street against our performance."[2]

Future of Cloudera

Reflecting on the IPO, Olson admits that Cloudera had a tremendous unfair advantage in the amount of financial resources they possessed that allowed the company to tolerate losses that other companies simply could not. "Cloudera is such an odd business," recounted Olson. "We raised $1 billion selling software. You'd expect to be building a plane manufacturing company with that kind of money, not selling software."

With the IPO a success and Cloudera now in the public space, it's time for Olson and Reilly to look ahead. Regarding the impact of the IPO on future outlook, Reilly says:

> "Even before the proceeds from our IPO, we are a fully-funded company. We are fully funded through profitability. With the proceeds of the IPO, that gives us even greater flexibility to look long term, look at this big market, and make sure that we remain the market leader by making the right investments, having the right partnerships and looking long term."

And Reilly knows that his role as CEO was only going to get tougher from here on. Being the market leader in the cloud data management space, Cloudera has to withstand the constantly increasing pressures from legacy corporations such as HP, Oracle and Microsoft as they too start catching onto Hadoop and the use of open-source software. Reilly is aware that since Cloudera is now a public company, it will also face competition from other startups aiming to disrupt the open-source software market.

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[1] Caitlin Huston, "Four things to know about the Cloudera IPO", marketwatch.com, April 28, 2017

[2] Anita Balakrishnan, "Cloudera shares close more than 20% higher on Day 1", cnbc.com, April 28, 2017

But Cloudera has a strategy in mind. Given that the fastest growing sector of Cloudera's business is the adoption of technology in the cloud, some of their biggest investments post-IPO were focused on the development of their business capabilities further in the cloud addressed specifically through partnerships with Amazon and Microsoft.

Olson also has personal plans of his own. Having been with the company from inception to current day, Olson has humble aspirations for his future in Cloudera: "My hopes would be that as time goes on, I get to be more involved in social causes within Cloudera that complement my day-to-day tasks."

Mike Olson and Tom Reilly continue to be the driving force behind Cloudera's success. Reilly attributes much of this success to the team dynamic that he and Olson plan to maintain:

> "I think this company would be nowhere where it is today if Mike had left. Cause while I pride myself in being an engineer from Berkeley, I only did it for two years. My profession – I became a sales guy. And a sales guy should not run a tech company. A sales guy with a strong technical partner can do it… Mike and I sit side-by-side at the end of a long hallway… we are like an airline ticket counter. We want the company to see that we are a team together."

Exhibit 1: Original Pitch Deck (excerpts) for Accel Partners September 2008.

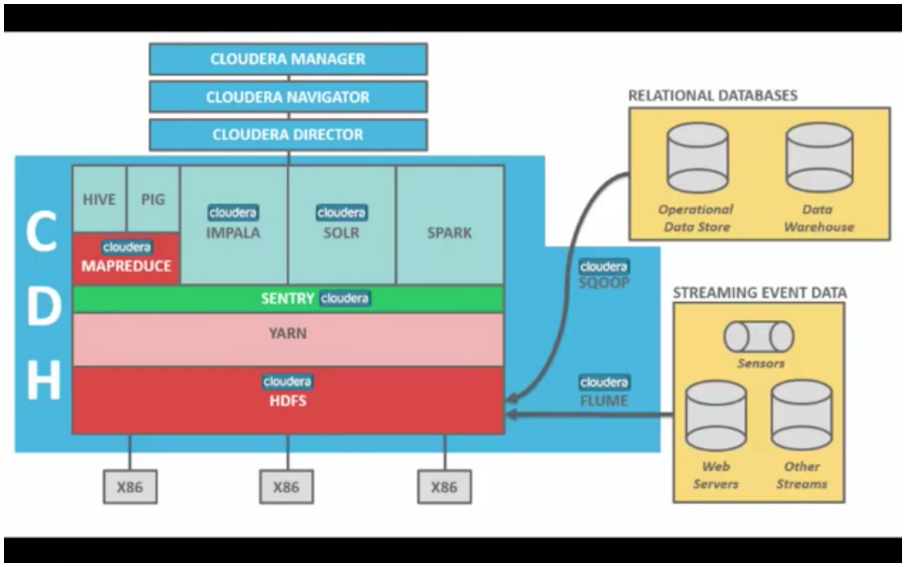
Source: LinkedIn - slideshare.net/AccelPartners/clouderas-original-pitch-deck-from-2008

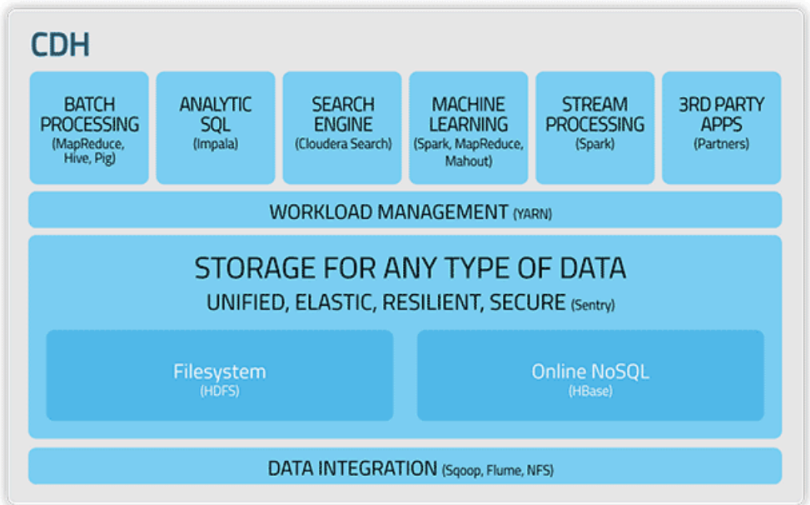
Exhibit 2: Cloudera funding rounds.

	Transaction Name	Funding Type	Money Raised	Announced Date
1.	Secondary Market - Cloudera	Secondary Market	–	Dec 16, 2016
2.	Secondary Market - Cloudera	Secondary Market	–	Sep 1, 2014
3.	Series A - Cloudera	Series A	$5,000,000	Mar 16, 2009
4.	Series B - Cloudera	Series B	$6,000,000	Jun 2, 2009
5.	Series C - Cloudera	Series C	$25,000,000	Oct 26, 2010
6.	Series D - Cloudera	Series D	$40,000,000	Nov 7, 2011
7.	Series E - Cloudera	Series E	$65,000,000	Dec 7, 2012
8.	Series F - Cloudera	Series F	$160,000,000	Mar 18, 2014
9.	Series F - Cloudera	Series F	$740,000,000	Mar 31, 2014
10.	Funding Round - Cloudera	Venture - Series Unknown	–	Sep 16, 2015

Source: Crunchbase - crunchbase.com/search/funding_rounds/field/organizations/funding_total/cloudera

Exhibit 3a-b: Two looks at the Cloudera framework.





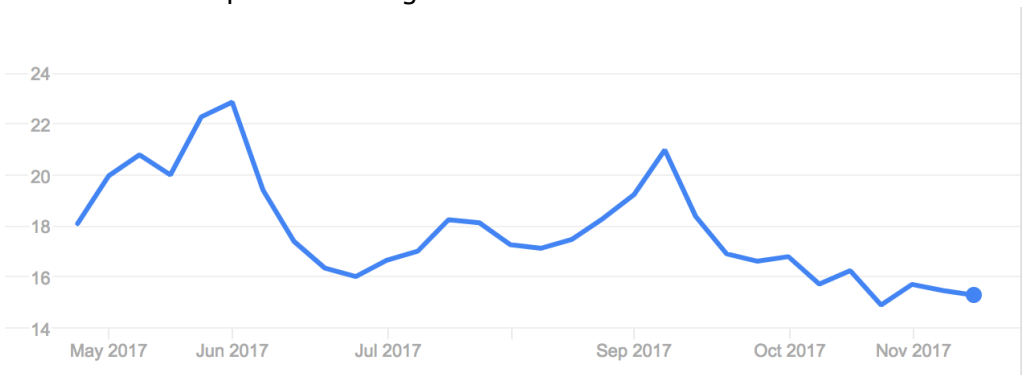
Sources: Cloudera youtube channel - youtube.com/watch?v=AZovvBgRLIY (a)
Cloudera - cloudera.com/documentation/enterprise/5-6-x/topics/cdh_intro.html (b)

Exhibit 4: Acquisitions.

Transaction Name	Announced Date
1. Myrrix acquired by Cloudera	Jul 16, 2013
2. Gazzang acquired by Cloudera	Jun 2, 2014
3. DataPad acquired by Cloudera	Sep 30, 2014
4. xplain.io acquired by Cloudera	Feb 3, 2015
5. Sense Platform acquired by Cloudera	Mar 22, 2016
6. Fast Forward Labs acquired by Cloudera	Sep 7, 2017

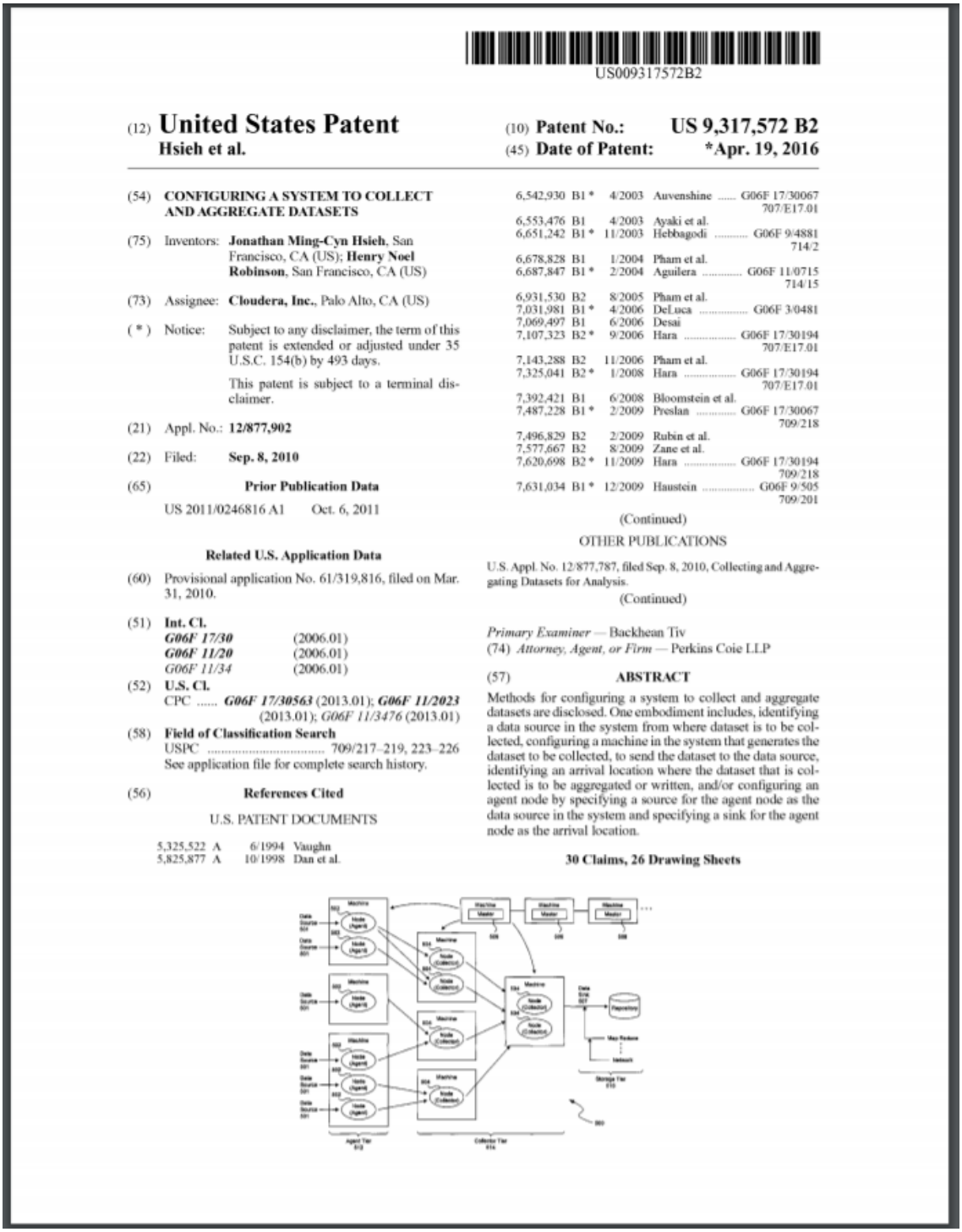
Source: Crunchbase - crunchbase.com/search/acquisitions/field/organizations/num_acquisitions/cloudera

Exhibit 5: Cloudera stock price following IPO.



Source: Google Finance - finance.google.com/finance?q=NYSE:CLDR

Exhibit 6: Patent for "Configuring a system to collect and aggregate datasets".



US009317572B2

(12) **United States Patent**
Hsieh et al.

(10) **Patent No.: US 9,317,572 B2**
(45) **Date of Patent: *Apr. 19, 2016**

(54) **CONFIGURING A SYSTEM TO COLLECT AND AGGREGATE DATASETS**

(75) Inventors: **Jonathan Ming-Cyn Hsieh**, San Francisco, CA (US); **Henry Noel Robinson**, San Francisco, CA (US)

(73) Assignee: **Cloudera, Inc.**, Palo Alto, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 493 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **12/877,902**

(22) Filed: **Sep. 8, 2010**

(65) **Prior Publication Data**

US 2011/0246816 A1 Oct. 6, 2011

Related U.S. Application Data

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(51) **Int. Cl.**
G06F 17/30 (2006.01)
G06F 11/20 (2006.01)
G06F 11/34 (2006.01)

(52) **U.S. Cl.**
CPC ***G06F 17/30563*** (2013.01); ***G06F 11/2023*** (2013.01); *G06F 11/3476* (2013.01)

(58) **Field of Classification Search**
USPC 709/217–219, 223–226
See application file for complete search history.

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Primary Examiner — Backhean Tiv
(74) *Attorney, Agent, or Firm* — Perkins Coie LLP

(57) **ABSTRACT**

Methods for configuring a system to collect and aggregate datasets are disclosed. One embodiment includes, identifying a data source in the system from where dataset is to be collected, configuring a machine in the system that generates the dataset to be collected, to send the dataset to the data source, identifying an arrival location where the dataset that is collected is to be aggregated or written, and/or configuring an agent node by specifying a source for the agent node as the data source in the system and specifying a sink for the agent node as the arrival location.

30 Claims, 26 Drawing Sheets

Source: United States Patent and Trademark Office - pdfpiw.uspto.gov/.piw?Docid=09082127

Berkeley Leadership Case Series

Berkeley ENGINEERING

20-180-001

December 6, 2017

Revolutionizing the Video Marketing Industry using Artificial Intelligence

At Vyrill's offices, towering above the Financial District and overlooking the Bay Bridge, Ajay Bam had a feeling that his team was about to revolutionize the video marketing industry. With an incredibly diverse team: Gay CEO, female CTO, a gender equal engineering team, three employees based in India, and one in Spain, Vyrill had the right foundation to disrupt Silicon Valley altogether. Their unique artificial intelligence technology was two years in the making; however, the series of events that led to this exact moment took a lifetime to develop. Vyrill was now ready to launch as the next "Google of video marketing". At the back of Ajay's mind, however, lingered pressing concerns. Vyrill was still trying to get its first customers-- their business model was not proven. Time was of the essence. Their 12-person team needed to bootstrap with little money and grow both faster and more efficiently than emerging competitors.

An Entrepreneurial Upbringing

Ajay Bam was born in Pune, India and raised in both Dubai and Muscat. As a child, he was surrounded by an entrepreneurial environment. His father owned a textile factory while his mother ran a greenhouse business – they were disconnected from the "9 to 5" lifestyle. Ajay was told at a young age to think big. As his father always used to say, "Own your destiny, don't work for one." Instead of asking "What must I do next to get by?", he grew up asking "What is the next big thing to solve?". His upbringing taught him to think big, be visionary, and to solve big problems.

Beyond this entrepreneurial mindset, Ajay also learned to think from many different perspectives. While, travelling the world, consequently, picking up multiple languages along the way, including German, Japanese and Arabic, Ajay learned to put himself out there and appreciate different cultures and backgrounds in addition to appreciating diversity. Ajay reflected, "You know who you are, where you come from, and what you have." He was ready to own his intel, instead of working for them.

This case was prepared in the Sutardja Center for Entrepreneurship & Technology by Lecturer Stephen Torres, editors Mudit Goyal and Thomas Ferry, and case researchers Adam Dada, Aneesha Lugani, and Austin Vuong, Devina Darmawan, Kevin Van der Eijk, and Tanvi Mongia. It was reviewed and approved prior to publication by a company designate. Funding for the development of this case was provided by the University of California, Berkeley and not by the company. Berkeley Engineering cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

An Education in Engineering and Entrepreneurship

Ajay earned his Bachelor's degree in Computer Science at the University of Mumbai and his Masters in Software Engineering from East Tennessee State University. After graduation, he began working in a rotational program at Lehman Brothers with the goal of developing his financial skills and background. After two years of learning numerous different skills while working at a large company in a rotational type program, he was ready to begin his entrepreneurial journey.

Ajay enrolled in Babson College's Entrepreneurship Intensity Track program to earn his MBA and further complement his skillset. This program was highly compressed and focused on developing the necessary skills to take a business idea forward to execution through the critical stages of exploration, investigation, and refinement. Classes, however, only made up 20% of his time at school, because the program graded more on the success of the new products that students developed. Ajay described the remainder of time getting an MBA as 50% networking and 30% pursuing your passion. At the end of the day, Ajay knew, "It was not about what your professors did for you, it was about your level of participation and what you brought to the table."

Ajay's First Startup

Between Ajay's first and second year at Babson College in 2000, he partook in a four-month international management internship by working at a startup in Munich, Germany. During this time, he noticed that fancier phones were becoming more popular in Europe. From this, he inferred that the same would happen in the United States. Along with better phones, it could also be inferred that mobile applications were going to soon explode. Ajay returned to the U.S. soon after and then, at the age of 26, started his first company, Modiv Media. Modiv Media developed both the first mobile wallet and mobile marketing technology in the country. The company pivoted from being a mobile wallet to more of a mobile rewards application after realizing that people were not enthusiastic about paying with their phones, but they were excited about reaping rewards points despite the payment method. Over a six-year period, the company raised over $18 million in funding. After growing his company for eight years, Ajay was ready to exit and look for new opportunities. Modiv Media was acquired by Catalina Marketing, which implemented their technology in major grocery chains across the country.

With his extensive experience in the mobile payments space, Ajay was then given an offer to join Nokia as their Senior Global Product Manager for Mobile Commerce and Billing. He took it. Although he considered Nokia to be one of the best companies he's ever worked at, Ajay noticed the company was in trouble. The company had over three groups of teams with different operating systems competing for market share rather than working together on a vision for one platform or device. Furthermore, while Nokia lagged in stepping up their smartphone game, Apple swept the market by storm. Ajay foresaw this doom and left the company in 2012, right before its acquisition by Microsoft.

The Creation of Vyrill

One phone call set the wheels in motion. After leaving Nokia in 2012, Ajay received a call from the Berkeley-Haas Undergraduate Entrepreneurship Program to be a lecturer on

entrepreneurship and innovation. Ajay gladly accepted and packed his bags for the San Francisco Bay Area, where he knew he wanted to launch another company, and was in the best environment to do so. Previously as the Global Product Management Leader of Nokia, Ajay wished he could make sense of the millions of customer review videos – what were they raving about? What were they complaining about? With over 3 billion smartphones in the world, every person in the room with a smartphone is a producer, director, and editor of video content. There was a huge market for leveraging user-generated video content, and thus, a huge opportunity.

After interviewing over 100 different brands about their problems, Ajay found the pain point: there was no platform to manage, analyze, and leverage video content. Brands had the desire to hear what people were saying about them on various social media platforms, but had no way to do so with one dashboard for video content. They wanted to be able to take action accordingly in real time, while needing the ability to use all this user-generated information for insights, promotions, and different digital marketing strategies. While working at Nokia, Ajay had led products and likewise wanted to make sense of customers' reviews.

Sifting through the millions of videos on social media about a product was impossible to do. For example, BMW cars alone have over 27 million videos on YouTube. If only there were a way to know which videos were reputable and which ones were not. If only learning the content of those videos, how many views they have, their ratings, and so forth could be found with a simple search. Ajay knew what he needed to build. But he also knew he didn't have the talent to do it alone.

Stronger as a Dozen

Vyrill began gaining traction in the penthouse of the Chase Building in Downtown Berkeley at the UC Berkeley accelerator, SkyDeck. Ajay lives by the motto, "take control of your story," which is exactly what he did while forming a disruptive, diverse group of people. Two star advisors – search expert Dr. Marti Hearst and artificial intelligence professor Dr. Michael Jordan – played key roles in advising the team. Dr. Marti Hearst recommended Dr. Barbara Rosario, who had completed her PhD in machine learning at Berkeley with her 10 years prior. It was as if Ajay had struck gold, as there are only 10,000 people in the world with significant expertise in machine learning. Barbara being one of them, joined the Vyrill team as co-founder and CTO. Ajay then formed a team of ten others over a two-year time period, including four Berkeley alumni as well as three India-based employees. Furthermore, many of the engineers on his team are women – a stark contrast to the lacking diversity in Silicon Valley.

Ajay not only strived to build a strong team, but also a strong culture where everybody feels safe and included. As a member of the LGBTQ community, he fostered a culture of diversity and acceptance so that his team could work well together and add value to each other. Under Ajay, there was an environment where everyone feels comfortable to grow.

Additionally, Ajay truly believed that the first 10 employees were the most important, because they would be the ones hiring the next 10 and setting the culture. Prior to joining the team, each potential member interns for four months. Then, both the Vyrill team and potential new member reassess whether they will be a good fit for one another. These values have set Vyrill apart from the rest of Silicon Valley – and investors have taken notice. The startup now operates out of the StartOut Growth Lab, an accelerator based in San Francisco that offers top quality office space, mentoring, education, and networking opportunities for young companies that happen to be founded or co-founded by LGBTQ entrepreneurs. With such a strong team and environment, Vyrill has developed an even stronger technology.

Pivotal Technology

Vyrill originally began with a B2C model, enabling potential customers to make sense of millions of reviews before purchasing goods all with one simple search. But first, the team needed to get brands to join their platforms so that potential customers could search for the companies' products. When companies saw the platform potential customers would use, they wanted it for themselves to monitor their own content – and they were willing to pay a lot more for it. So, the startup switched from a B2C model to B2B.

Vyrill's artificial intelligence capabilities enable brands to hear what people are saying about them on various platforms. Brand managers want to use Vyrill for deeper insights about their products, customers, promotions, and digital marketing strategies. For example, Vyrill is now able to go on YouTube and find every video for BMW and match it by car make, model, year, and more. This platform is being trained to watch millions of videos simultaneously, understanding their content on a massive scale and provide insights based on the AI-generated analysis. From there, the platform can notify brand managers to take according action in real time. Complaints can be addressed by the company's customer service department before the outbreak of a massive PR crisis while praise can be leveraged by the company's marketing department.

Not only can Vyrill identify information about the product being described, but it can also identify information about the person in the video. Sentiment and age analysis can determine whether the review is positive or negative as well as whether the person is a customer or professional expert. Soon the technology should be able to use facial recognition and tone analysis to identify sarcasm, anger, frustration, joy, and sadness. Interestingly, companies are not only limited to their own products but can also see the same information about their competitors and react accordingly. Currently, Vyrill is focused on electronics, beauty, consumer packaged goods, automotive, and appliance industries. Once these millions of reviews are deciphered, they can automatically be added to their corresponding Amazon product pages.

The Future of Vyrill

Vyrill still has a long way to go. With a new market to explore, the company needs to find ways to attract its first customers and figure out how much they will be willing to pay for this new technology. Though the business model has changed, it is still not yet proven to be effective. Competitors have begun emerging and are also in the race to become the leader of video marketing. Moreover, given the scarcity of machine learning experts around the world, Vyrill needs to compete for talent against other major companies that can offer far more appealing salaries. Ajay's concerns still remain, "How do we bootstrap this with little money and 12 people?"

Nonetheless, Vyrill is set on this ongoing journey to be a successful pioneer of the AI video marketing industry. In Ajay's own words, "We want people to just think of Vyrill when they think of videos, and let users understand these videos." With the hope of owning the video marketing space and becoming the Google of video marketing search, Ajay ponders Vyrill's path for success.

Exhibit 1. The Founders of Vyrill

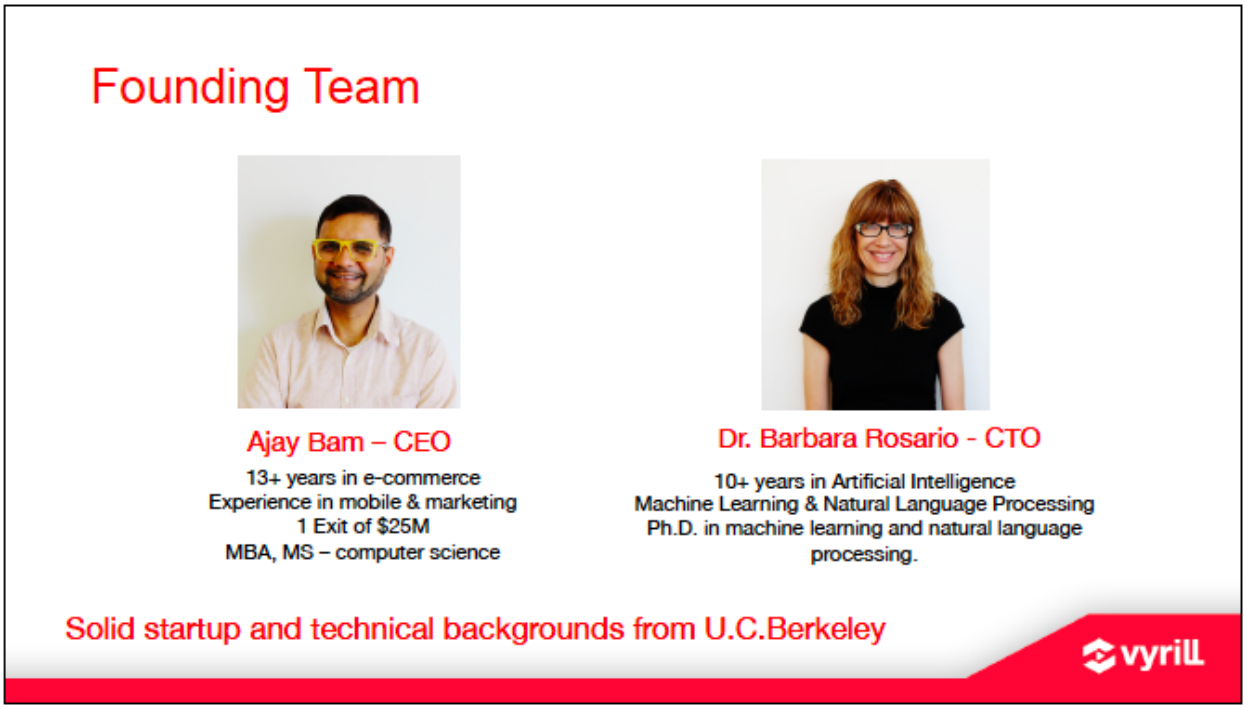


Exhibit 2. The Inspiration for Vyrill

Exhibit 3. The Volume of Videos for a Company

Exhibit 4. A Look at Vyrill's Dashboard

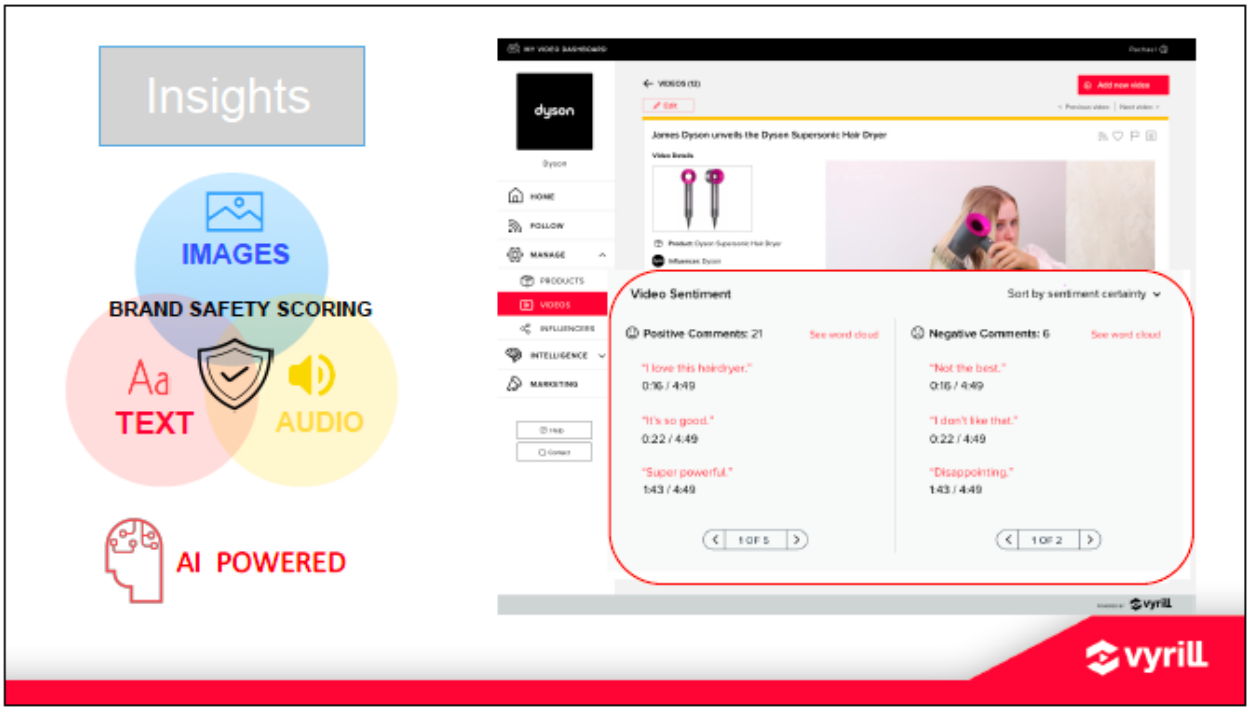


Exhibit 5. The Business Impacts of Vyrill

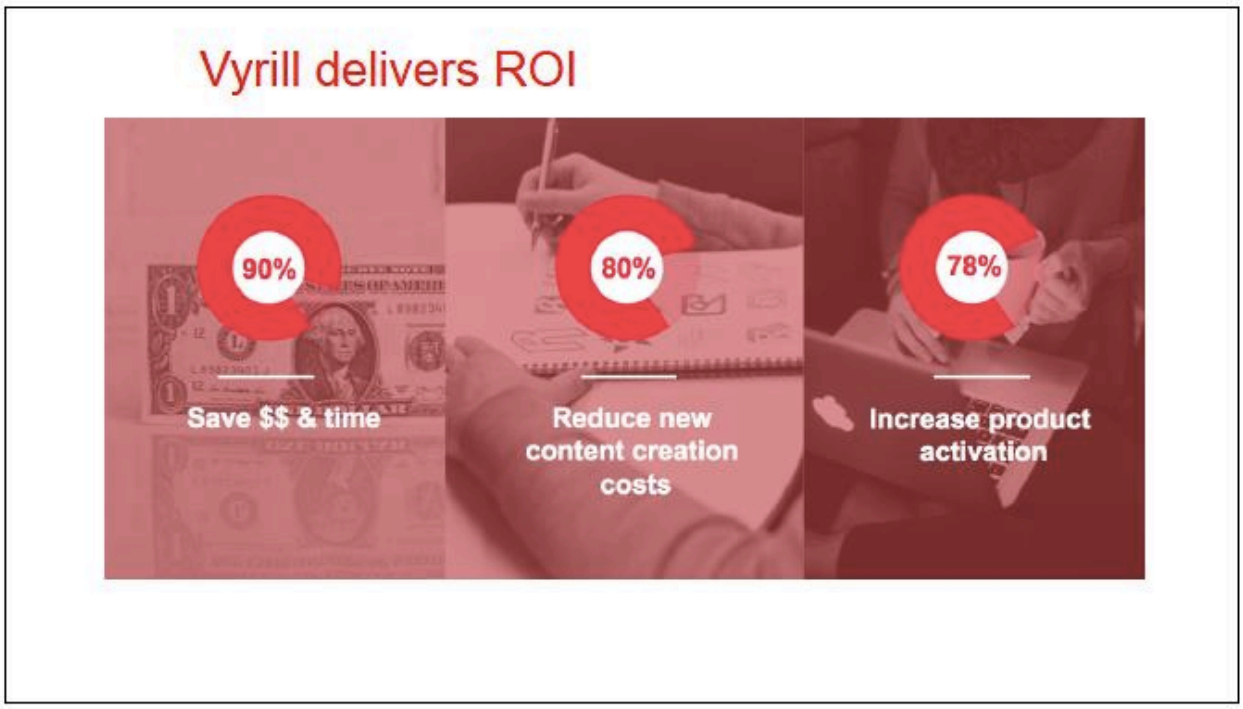
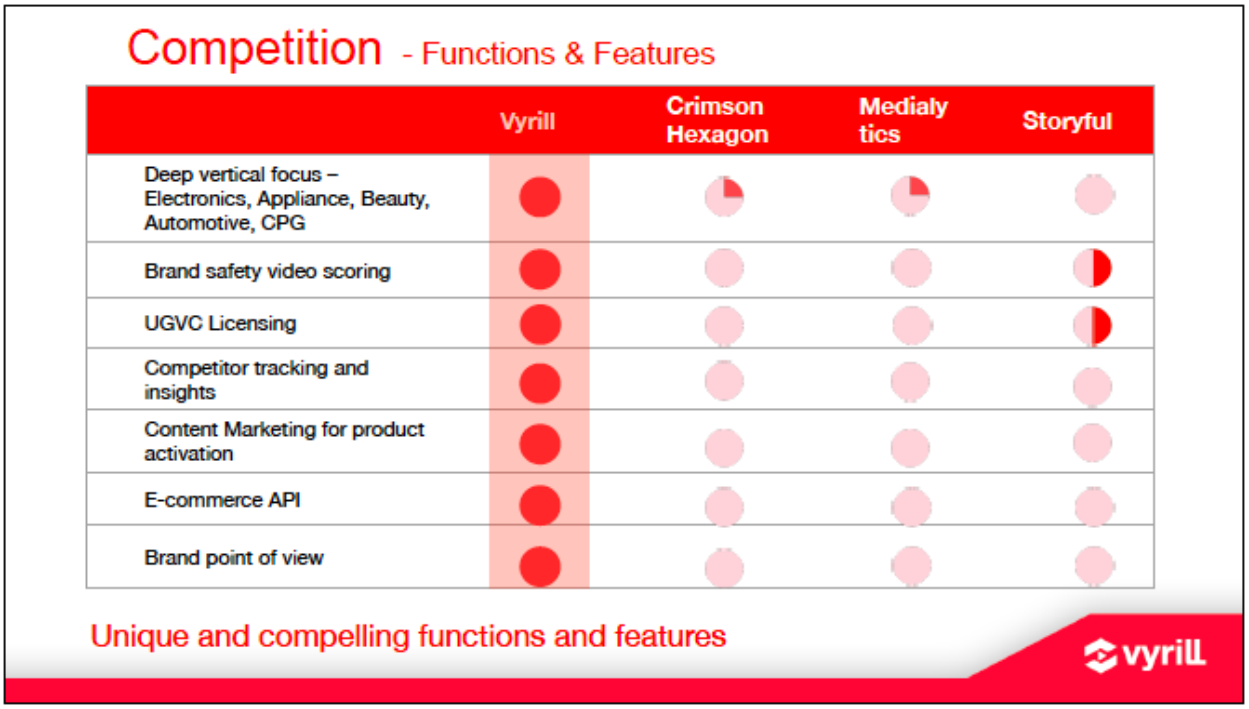


Exhibit 6. The Competitive Edge of Vyrill



Berkeley Leadership Case Series

20-180-010

December 17, 2017

In It for a Marathon: Jessica Mah and InDinero's Resilient Founding Team

Jessica Mah had just gotten off the phone with her voice of reason, her mother. Earlier in the evening, she had been to dinner with her startup co-founder and friend, Andy Su. Both knew that they were about to make an important decision that would make or break their venture. Jessica had been building her startup inDinero, a financial management software for small businesses, for a little over a year and things had been going well. Basking in the validation of their acceptance to Y Combinator, Mah and her team had garnered the attention of high-profile investors, leading to an initial investment of $1.2 million in 2010.[1]

However, by October of 2011, cash was running low and tensions were running high. Users were not renewing the service and revenue streams significantly declined. While the business had been growing, so had the inDinero team; however, without the revenues to support it changes had to be made. With just weeks of runway remaining, about $150,000 of the initial investment, Mah's startup was moving towards insolvency. That night while at dinner with her cofounder in San Francisco, Mah made her decision.

The next morning Mah began laying off nearly the entirety of her staff, calling the rest of the process "relatively easy."[2] Laying off her staff was a no brainer. If she didn't, her company would fail, and her staff would inevitably lose their jobs anyways. By laying everyone off - InDinero was given the chance to fight another day. Although the decision to lay everyone off had seemed "like a joke" just days before when a friend suggested that she do so, she now realized that it was the only way forward. Walking meetings on the streets and in the malls of San Francisco with a very straight forward script expedited the layoffs and made the process run smoothly, even though inDinero could not afford severance packages. Once the process had been completed, Mah "felt relief" rather than sadness over the fact that she now knew that inDinero would survive, at least for a few more months of intensive fundraising.

Background

Jessica Mah was born in Westchester, New York, just north of New York City. Her childhood was overshadowed by the technological boom of the 90's, as she taught herself how to code at the age of 10. Both her mother and her stepfather had immigrated from Hong Kong and are

This case was prepared in the Sutardja Center for Entrepreneurship & Technology by lecturer Stephen Torres, editors Thomas Ferry and Mudit Goyal, and case team Amy Philip, Henry Keenan, Jonathan Archer, Kyle Geitner, Samantha Cristol, and Vanessa Salas prepared this case. It was reviewed and approved prior to publication by a company designate. Funding for the development of this case was provided by the University of California, Berkeley and not by the company. Berkeley Engineering cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

entrepreneurs themselves. As Mah entered middle school, she showed a proclivity towards following in their footsteps. She began her first business at the age of 11 by purchasing server space in bulk and then selling fractions of the space for cheaper prices. Her "competitive advantage" revolved around providing a higher level of customer service than competitors could offer. However, going into high school, Mah recognized that her grades were starting to slip. In her family, her grades came first. Worried about her future, she sold the client base, and focused on her schoolwork as she entered the 10th grade.[3]

Halfway through her high school experience, Mah decided she needed a change. She was scared that her poor grades in middle and high school would lead to a jobless and unfulfilling adulthood. In response to these worries, she dropped out of high school at the age of 16, and began attending Bard College at Simon's Rock. Simon's Rock is known for their early college program, which allows young students to begin their college education early without having received a high school diploma. At Simon's Rock, she earned her Associate's degree and decided to transfer to pursue a career in computer science. She searched for a school that was of high academic standing that admitted transfer students. After applying to the top CS programs, she landed at the University of California, Berkeley.[4]

At the age of 17, Mah began her studies at Berkeley as a computer science major. While her young age did not inhibit her socially, she felt that she was behind academically, coming into a highly technical program with a liberal arts background. Thankfully, Mah found a lab partner that she could trust. Andy Su was a fellow classmate of hers and the two hit it off. They found that not only did they work well together, but also that they enjoyed each other's company. Through all this, Mah's entrepreneurial roots never left. Now that she was immersed in the Silicon Valley culture, she started coming up with her own ideas. While at lunch with her friend Arielle at Berkeley's Italian restaurant, Gypsy's, her next venture was born: internshipIN.com (See **Exhibit 1**). After bringing Andy onboard, the three students decided to go for it. InternshipIN.com would connect early and mid-stage startups with students seeking internships.[5] Going in, Mah knew that the quality of their work was low, but that did not matter. What internshipIN.com lacked in quality, it made up for with real-world practice.

A year later in their third year at Berkeley, after finishing up homework early Mah and Su moved forward with their newest idea: a startup that would help small businesses and other startups with their financial data and tracking. Coming from a founder's background, Mah had experienced many pain points related to taxation and financial data when it came to both her server hosting business, and internshipIN.com. Mah was determined to get better at managing money in order to make sure it was never a problem for her again at any future start-ups. While researching how to handle finances, she realized that this pain must be widespread, and inDinero was born.

Computerizing the Small Business

Mah and her co-founder found themselves alone in their 2-bedroom apartment, now the InDinero headquarters. They had just laid off their friends and were out of funds. In 2010, while in their early twenties, the two had founded InDinero, an accounting platform to help small business manage their finances. By June 2010, inDinero entered Paul Graham's Y Combinator mentoring program, and Mah took her product live just one month later. By September, she had closed a $1.2 million angel investment round that included YouTube co-founder Jawed Karim and the seed fund 500 Startups. At the end of 2010, inDinero had seven employees and 6,000 customers, managing over $2 billion in customer transactions.[6] Customers paid from zero to $100 a month, depending on the number of transactions the company tracks. By then Mah and her team, most of whom shared a four-bedroom house in Mountain View, were working from 10 in the morning until "midnightish." Mah calls the hours "very reasonable." Investors loved the idea, and InDinero was a destined for success– or so it seemed.[7]

InDinero's first few years failed to live up to the high standards that they had anticipated. When launched in 2010, inDinero offered a financial dashboard for business owners to track their cash flow. However, Mah soon discovered that her product, which was essentially a Mint.com for small businesses, was flawed, and their business model unsustainable.[8] To complicate matters, she was powering inDinero with seven of her closest friends from Berkeley, including her co-founder, Andy Su. The initial product consisted of purely software to help with their money handling, charging $10 - $20 a month per user. While initial reviews were positive, there seemed to be a disconnect when it came to product market fit. Customers were attracted to the product, but would later cancel after a few months of use. InDinero desperately needed to capture the opportunity within the small business market, and that would only happen by offering a product that customers deeply needed and would stay committed to. Even more importantly, InDinero needed to find a way to beat the competition.[9]

The Competition

When speaking with customers, Mah found that most cancellations occurred after small businesses spoke with their accountants. Small businesses largest concerns were not regarding the tracking of their finances, but rather avoiding tax fines. While business owners enjoyed inDinero's financial tracking dashboard, it functioned "[like] a vitamin- nice to have, but people didn't really need [it]."[10] What the small businesses did deem necessary, however, was the hiring of accountants. These accountants offered financial services beyond inDinero's capabilities, saved the businesses from fines, and as a result, advised against the use of inDinero. For all intents and purposes, accountants were the startups direct competition. In order to achieve success, inDinero needed to break the need for an accountant completely.

Listening and Learning

After firing her staff, Mah and Su were the only two people working to keep inDinero alive. With diminishing capital and a receding user base, it was obvious to them both that the company needed to pivot. It was not until Mah visited a customer in his office, however, that she realized how.

> "I went to a customer's office and he was like 'I'll pay you thousands of dollars if you do all this for me.' The lightbulb went off - I was like ok I'll charge you a few thousand bucks."[11]

With a revived vision and new goal at hand, inDinero's focus began to shift. The new problem that Mah and Su faced was to create a software that could completely handle a small business's financial and accounting needs. Not only that, but that product would have to be trustworthy and reliable enough that businesses would turn to it in place of a human. Although the task was daunting, the decision had to be made. If this customer's pain was representative of the entire market, inDinero would be able to do well. If it was not, more time and money would be squandered away. inDinero was running out of funding, and a change in product offering appeared to be the only clear path forward. With only these options presented to her, Mah chose to rise to the challenge. An accountant was hired, and the three of them set to work (See **Exhibit 2**).

Gaining Financial Stability

Having found a new product offering that was working well, Mah began to rebuild her business. After the 2011 ordeal of firing her entire staff, Mah had a higher appreciation for the weight of her decisions. One of her biggest was her refusal to raise venture capital or private equity

funding. Mah says that she was in it for "the marathon, not a sprint", and needed to maintain her deeply valued autonomy.[12]

Although many advisors questioned her choice, Mah does not regret her decision. The lack of VC and private equity investment allowed for her to build her own board of directors, maintain majority ownership of the company, and retain her control over company decision-making. More importantly, she feels that she can continue to improve and build inDinero, without being pressured into going public or selling.

> "I have like a 10-20-30 year outlook on the business. Like, if a business grows constantly over 10 years, run that through a compounding growth calculator online, you will see that- even if my business grew 25% every year for the next ten years- I'll basically have a million-dollar business. Versus if I was growing 60-70% a year, and I raise all this VC money, I don't have control, over my own business. I would probably be forced to go through a liquidity event sooner- I'd be forced to sell the business, go public, I'd have to raise more capital to grow at that rate or else no one is going to get their IRR 30% return."[13]

Although Mah has not taken VC funding, she has received Angel Investment. Notable inDinero investors including Kevin Hartz, Bobby Yazdani, Hank Vigil, Fritz Lanman, Coyote Ridge Ventures, SaaS Capital, and Streamlined Ventures. In the year 2014, Mah was able to raise $8.8 million in funding, and grew the company to two hundred employees.[14]

Hiring and Firing

After the 2011 decision to lay off the entire staff, Mah had been careful to regard hiring as a vital and incredibly important step towards growth. However, she had realized that friends do not always make the best business partners, and worked towards improving interviews. She wanted them to be as open and honest as possible- and she needed her prospective employees to be aware and okay with the absence of venture capital funding, which she was not going to take.[15]

In just three years, Mah grew inDinero to roughly 200 employees, largely due to the $2.4 million sales growth spurt that the company experienced between 2012 and 2014. Additional offices were opened in New York City, Portland, and Manila, with the main office remaining in San Francisco. By 2017, the company that had dwindled to merely two employees in 2011 with less than $40,000 in yearly sales had now grown by 120 times over (See **Exhibit 3**).

However, in February of 2017, Mah noticed again that her company was not operating as efficiently as she had expected. Her co-founder, Andy Su, attributed this to poor decisions in 2016 such as retaining nonperforming employees. Customer acquisition costs were higher than expected, and waste was rampant. This time, Mah decided that she was not going to let history repeat itself. Her decision to lay off twenty percent of her workforce was tough but necessary, and happened fast.

> "We had to do it because we were inefficient, bloated, wasting resources, wasting money. Our margin numbers, the cost of acquisition numbers, were through the roof. I made the call to do it, and I told my leadership team you have 2 and a half weeks to take care of this."

Giving her leadership team such a short time span was purposely done: dragging out layoffs resulted in more time lost, and waste of human capital. At inDinero, Mah has worked to build a culture that is supportive of fast and drastic decision making. "We're like a high-performance sports team, not a family. If someone is no longer a good fit, we have no problem finding them a new home elsewhere."[16] Despite this, Mah ensures that her team of "inDinerians" feels valued

and important, and keeps them all working towards the greater goal of improving the client experience.

Despite all the hiring and firing cycles in inDinero's relatively short history, Mah has managed to keep her core team consistent as they grew the company. This was essential as they kept Mah supported and encouraged her to take healthy breaks from inDinero and pursue flying -her dearest hobby- and to organize frequent team visits to Burning Man. In the words of her co-founder Andy Su, "Flying and going to Burning Man are essential parts of what keep her sane in a very stressful startup environment. I believe that going to Burning Man really helps her keep perspective and enable a special bond between the members of inDinero's core team." Mah has demonstrated with clarity in her short but eventful career that her and her core team's mission is not to employ large groups of her friends, but to maintain her company's chances of survival, with a lean, efficient, and focused team. Anyone else is expendable when the survival of the company is at stake.

Conclusion

Today, inDinero has become a well-recognized force in the small to medium size business software space. The customers pay three to four figures monthly for the startup's proprietary technology, which handles all accounting and taxes. InDinero caters to the specific needs of companies and treats each as an individual, providing personalized business services as the company desires, making InDinero not only recognized but appreciated by its customers.

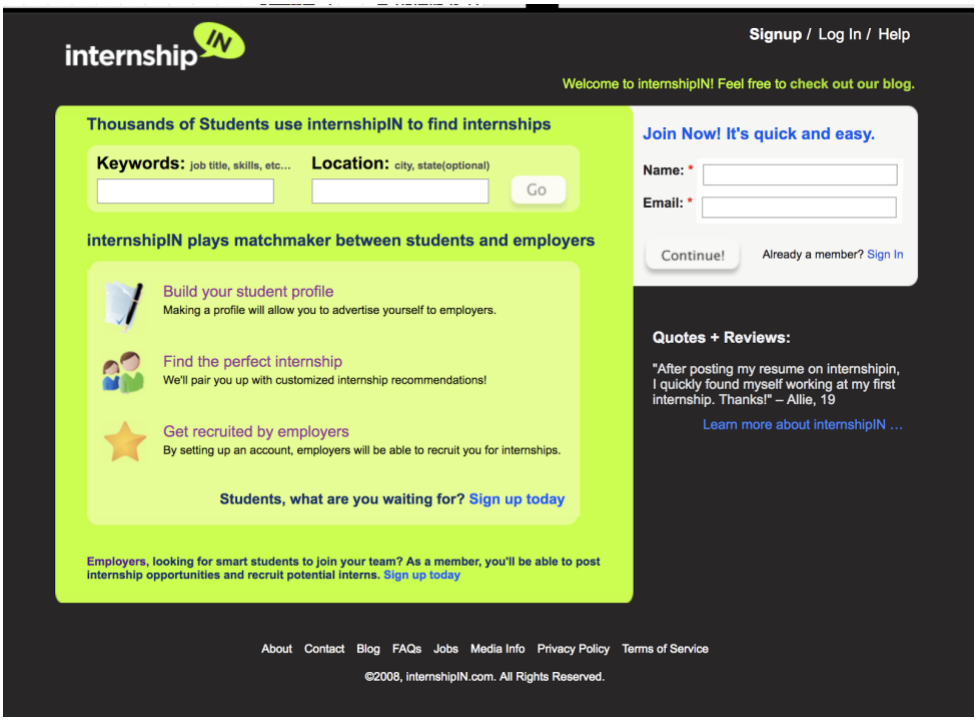
Multiple pricing plans are available, ranging both in price and amount of services (See **Exhibit 4)**. Amount of transactions, amount of accounts, and inventory or payroll accounting make up the variations between their different services. However, holding true to their goal of improving the client experience, custom pricing with specialized services and features are offered, as are tax expertise and finance resources.

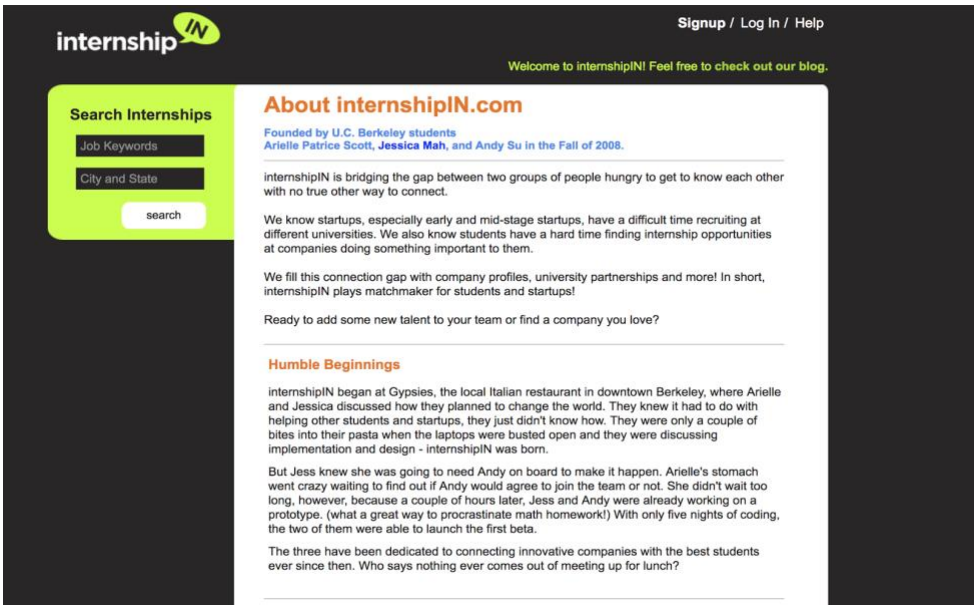
Mah hopes for inDinero to revolutionize the way back office operations take place. She envisions inDinero expanding upon their services to the point where they can automate all back-office functions. "We want to transition this company into an amazon for business services - where any business can have all of their general business service needs catered for by inDinero."[17] As Amazon started with books, inDinero has chosen to start with accounting and taxes.

Mah acknowledges that these ambitious goals will take time, but she is in it for the long haul. "I could sell my company and make a lot of money today but why would I do that if I'm having fun? I like what I am doing because it is challenging."[18] As Amazon experienced, scaling a product driven company into a fully-fledged marketplace is indeed a challenge. It will ultimately be up to Mah and her newly trimmed team to meet it.

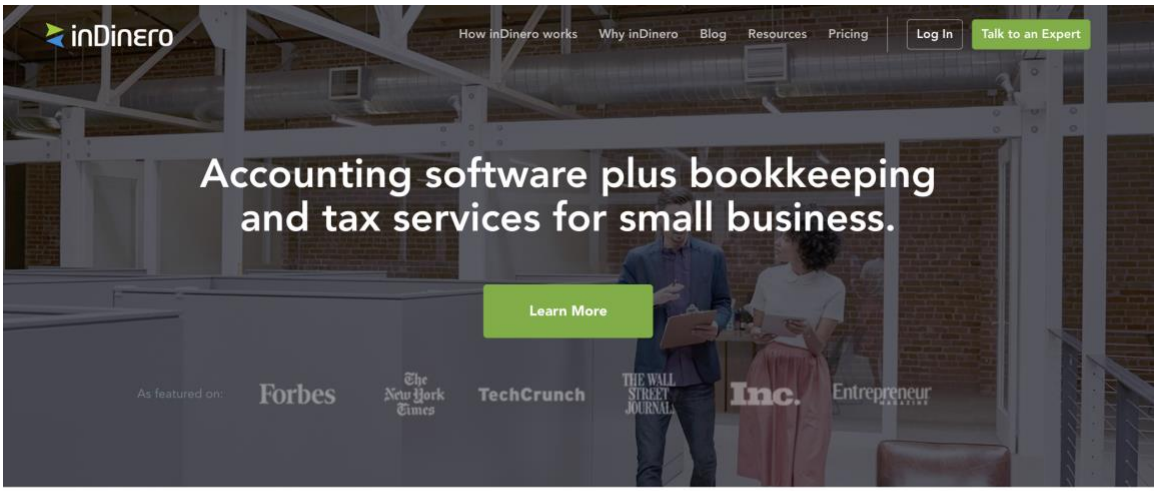
Appendix

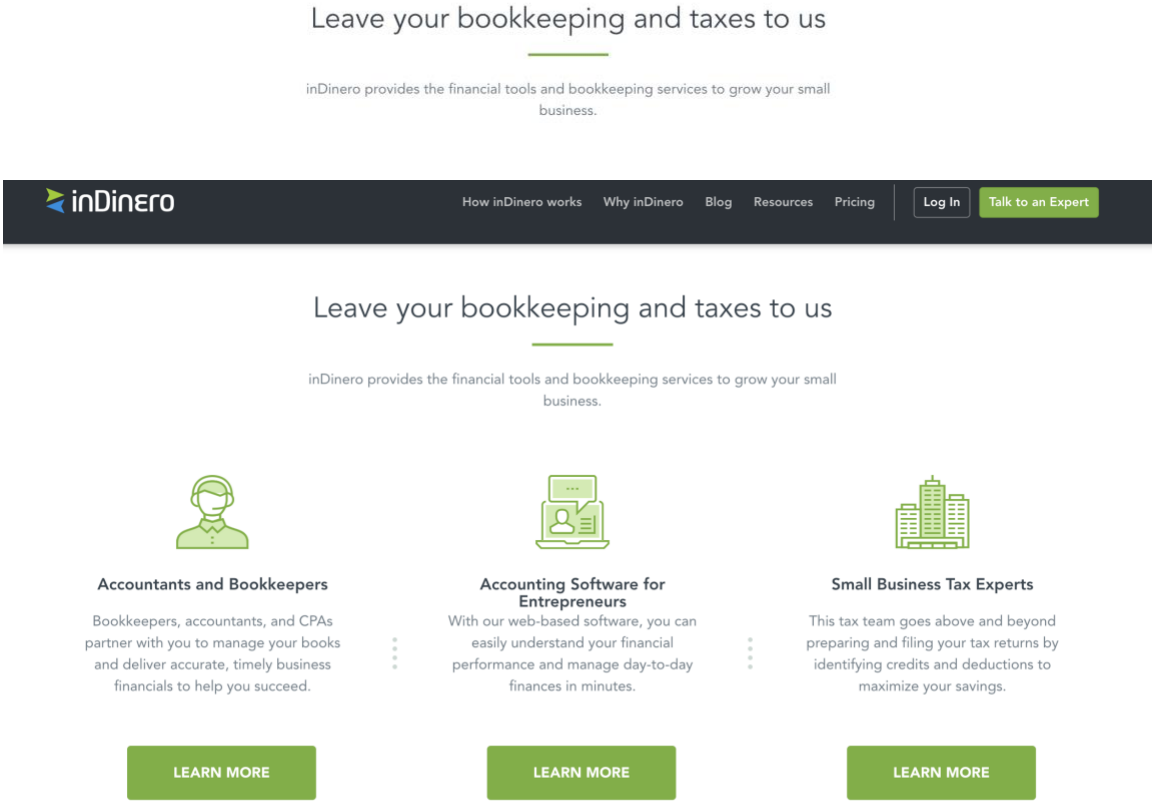
Exhibit 1 Screenshot of internshipIN.com platform, March 2010





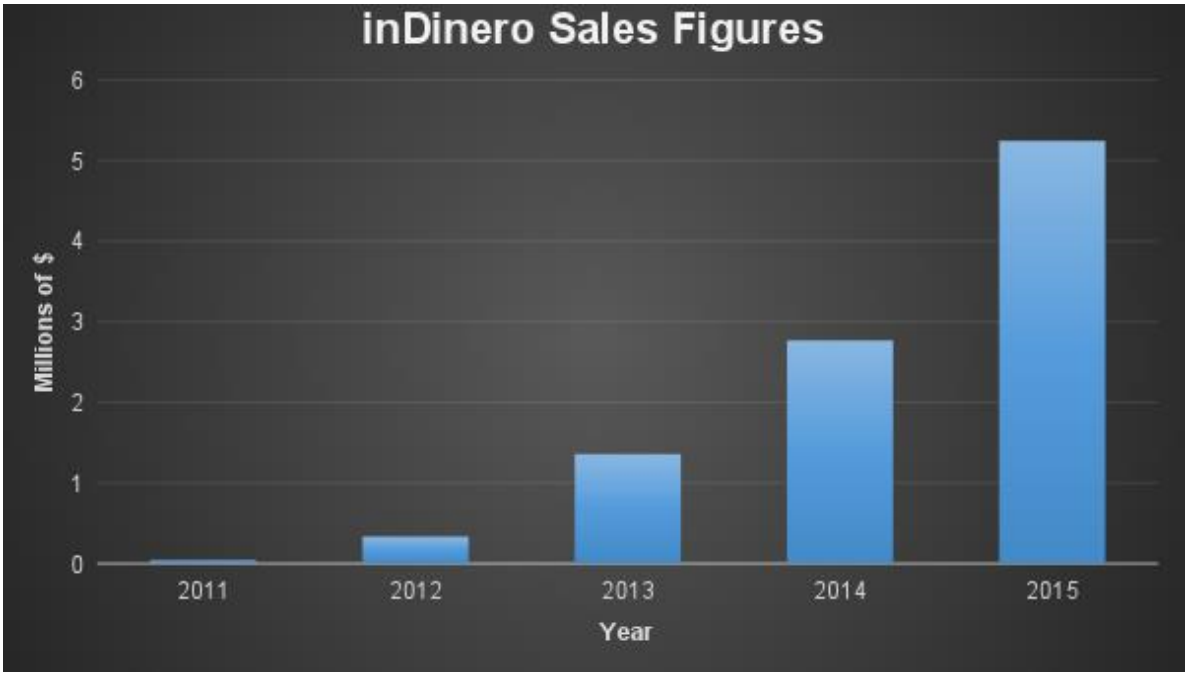
Source: March 10, 2010, Wayback Machine http://archive.org/web/
Exhibit 2: Screenshots of inDinero platform, November 2017

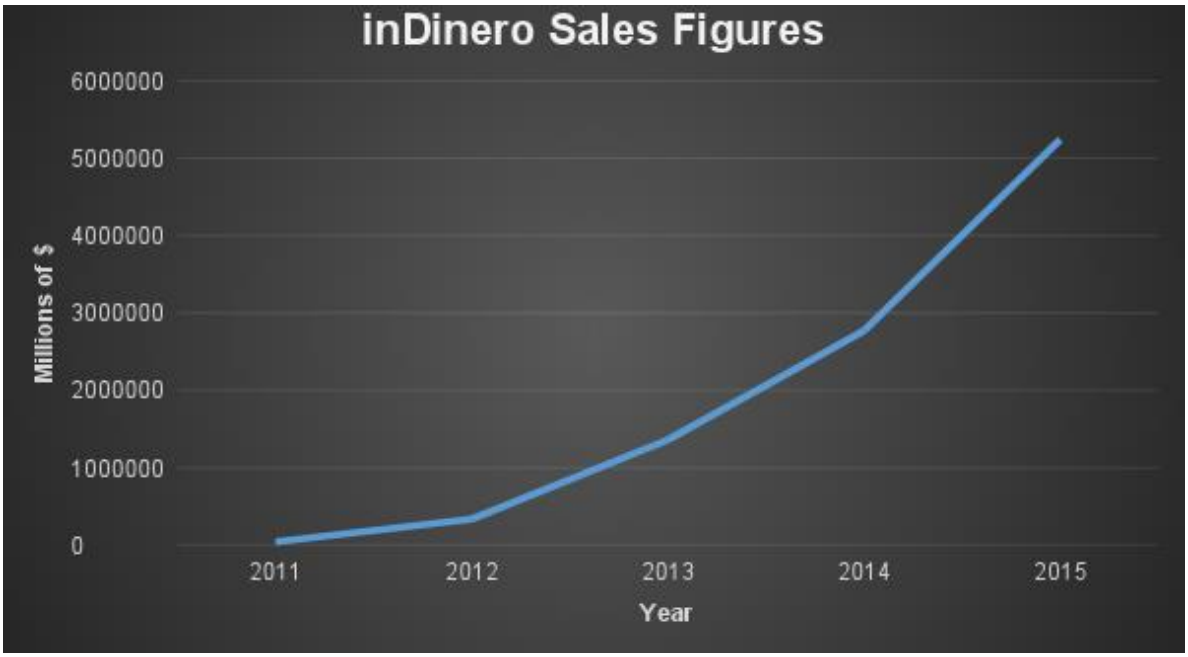




Source: https://www.indinero.com/

Exhibit 3: Sales figures from 2011-2015





Source: Jessica Mah, email

Exhibit 4: Pricing Plans

The Basics

- Starting at $295/mo. – Billed Annually
- For small businesses that need clean and simple accounting that addresses compliance
- 2 Connected Accounts
- Up to 50 Monthly Transactions
- Annual Federal & State Tax Filing

- Profit & Loss, Balance Sheet, Cash Flow Statements
- Invoicing & Bill Pay
- Employee Reimbursements

The Essentials

- Starting at $500/mo. – Billed Annually
- For most small-to-medium sized businesses that want robust accounting so they can focus on their core business
- 3 Connected Accounts
- Up to 100 Monthly Transactions
- Annual Federal & State Tax Filing
- Profit & Loss, Balance Sheet, Cash Flow Statements
- Invoicing & Bill Pay
- Employee Reimbursements
- Payroll Reconciliation

The Next Steps

- Starting at $1250/mo. – Billed Annually
- For companies that require accrual accounting, inventory recognition, and advanced reports for decision makers
- 4 Connected Accounts
- Up to 200 Monthly Transactions
- Annual Federal & State Tax Filing
- Profit & Loss, Balance Sheet, Cash Flow Statements
- Invoicing & Bill Pay
- Employee Reimbursements
- Payroll Reconciliation
- Inventory Accounting
- Revenue Recognition

Source: https://www.indinero.com/pricing

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Berkeley Leadership Case Series

20-180-002

December 2, 2017

From LinkedIn to Looped In—An Entrepreneur's Early Journey

See differently. Think differently. Act differently.

— Loop Now Technologies, Inc. foundational pillars

Live download and usage metrics streamed on wall mounted televisions while team members gathered around. The team was enjoying a much-needed break after 4 days of little to no sleep. This is the scene in the quiet Mountain View office that Loop Inc. and its co-founder, Jerry Luk, call home. They had just launched their new app, DoubleDouble. It is their second product to make it to consumers, and one that promises to shape the forward trajectory of the company. Luk and his team will give it 60 days—if it does not meet their predetermined goals along three metrics after those 2 months, then the app will be scrapped, no questions asked. But if it does meet those hurdle metrics, then Loop will be forced to make a decision that could make or break the company.

Maintaining two apps simultaneously is challenging for a small team like that of Loop. Maintaining three would be impossible—unless, of course, Luk and his team pursued more capital and built out their team. Should Luk scrap one of Loop's existing products to make room for another iteration, or should he pursue the venture capital that would make expanding the team's development capacity possible? It is a decision that will inevitably stem from the views and values of the company's founder.

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Luk's Early Years: Fostering the Spirit

Jerry Luk was born in Hong Kong in 1982 and raised as an only child to working class parents. Hong Kong was still governed by the UK in the 1980's. This had a profound impact on Luk's development. Political and economic transitions were bumpy, with Western and Eastern cultural clashes being the norm. Luk was left to passively absorb all of this turbulence. That desensitization contributed greatly to his success later in his life. "Growing up, I thought that kind of chaos was standard," Luk laughed, "I still always see myself as being caught between China and the US." The ability to thrive in a seemingly disorganized and tumultuous space would be a critical component of Luk's working style. In the 1980's, not only was the socio-political environment of Hong Kong changing, but also technological advancements were rapidly gaining significant traction. As a result, the city was experiencing widespread material abundance and economic affluence which led to Luk being exposed to technology at a relatively early age. This fast-paced and competitive world enabled him to express his interest in computers, and primed him for success later in life.

When Luk turned seven, his father enrolled him in a coding class about BASIC which seemed to open a magical door for him—his excitement in technology had been sparked, and his obsession has never waned. Luk was quite the headstrong individual growing up, and neither liked to follow instructions from his parents, nor do what he was told to by others. After recognizing and understanding his rebellious spirit, his parents changed their tactics and began to give him the freedom to develop his own interests. "My parents were really supportive and open-minded," Luk explained. "They stopped telling me what to do, and instead told me how to do it. They gave me the freedom and space to make my own choices." This worked, and it played a defining role in his entrepreneurial development by nurturing his individualism and encouraging his independent thinking.

Luk received his first computer when he started secondary school at Salesian English School in Hong Kong, an all-boys school founded by the Roman Catholic Religious Institute from the UK. "Seeing that big glowing box with so many buttons and possibilities absolutely fascinated me. Of course I broke it in the first day!" Luk's world was changing, and his ambitions were finally able to take root. "Computers weren't a thing in Hong Kong back then. Having one inspired and enabled me to participate in the technological revolution I was hearing so much about." He would spend hours studying different programming languages, teaching himself how to write code, late into the night. He quickly became proficient in both C and Java, skills that would undoubtedly come in handy later. The most valuable thing he developed during this time, however, was his insatiable thirst for knowledge.

Not only did Luk continue to express his desire to learn privately, but he also actively involved himself in the academic community from a young age. At the age of 13, Luk entered a scholastic technology competition, and along with a few of his peers, developed a robotic arm and hand that could be controlled remotely by a sensor-laden glove. The team's hours of hard work were rewarded, not only with the first prize in the competition, but also with an article in the local newspaper. While he could never have known so at the time, this strategy of working hard on a single project over a short period of time would go on to become a trademark of Luk's style of rapid iteration.

At the age of 18, Luk was finishing high school and considering the different paths he had laid out in front of him. "I always knew that I wanted to study abroad, but being from Hong Kong, it would have been easier for me to study in the UK instead of the US." However, Luk was inspired by the innovation and creativity coming out of Silicon Valley, and after much debate, he decided to go to California. He attended University of California, Berkeley to be as close to the epicenter of Silicon Valley as possible, and focused his studies on computer science. Cultural pressure in Hong Kong at the time emphasized education as the primary path to a profession, and as a result, Luk adopted the same paradigm as many of his international peers: a Bachelor's Degree was not enough, and Master's or Ph.D was a requirement of academic achievement. As such, he sought out research opportunities that would prepare him for graduate school and never once held an internship while at Berkeley. While Luk retrospectively wishes he had branched out a bit more, he enjoyed spending his undergraduate summers performing research for CITRIS, an information and technology program focused on improving society. CITRIS exposed him to cutting-edge computer research and pushed him to think big—he reminisced, "during my time at Berkeley, I met some of the brightest people I know. The environment at Berkeley is extremely competitive, and my upbringing in Hong Kong enabled me to thrive." Another critical juncture in Luk's life was about to occur, one that would force him to decide between building off his past or inventing his future.

LinkedIn Mobile's Astronomical Launch

As his time as an undergraduate ended, Luk received acceptances from graduate programs at Berkeley, University of Pennsylvania, and Cornell University. It was November of 2004, and he had started looking for summer employment to make money before following his plans and going to graduate school the following fall. He applied to many companies, among them both Apple and Google. Luk was also contacted by Eric Ly, the co-founder and CTO of new Silicon Valley startup. Ly had obtained Luk's resume from a Berkeley school database and wanted to hire Luk as one of the startup's first few employees in a junior software engineering role. Tired of the onerous recruiting processes of larger companies, Luk agreed to an interview with the startup. In his conversation with Ly, he learned that despite only being at the company for a summer, he would still have a substantial part in day-to-day operations. Luk wanted to learn, make a difference, and have influence with the company and product he worked on. The ability to contribute immediately at a startup appealed to him much more than the chance of being marginalized at a large company, and he made his choice accordingly to join the startup, LinkedIn. Luk had large personal ambitions, and he pursued the company that could help turn his ideas into reality. On top of that, he believed that this intensive style of work would better prepare him for graduate school.

Once Luk felt comfortable in his new position, he approached Reid Hoffman, LinkedIn's founder, and asked for some mentorship advice. Hoffman quickly addressed the heart of the matter, and asked Luk what his goal in life was. Luk wanted to start a business, and despite his indoctrinated faith in higher education, he wanted assurance from Hoffman that an MBA was the answer Luk was extremely surprised when Hoffman replied "Absolutely not. Business school doesn't teach you what you can do, it teaches you what not to do. Start-ups are about creating and opening a door that you didn't even know existed. If you only know directions that you are

not allowed to go, then your options and scope quickly become limited." Luk decided to stay at LinkedIn.

The working environment suited his style perfectly. Like Luk's parents had done years before, Ly realized that Luk was able to contribute more effectively to the company if given free space to work creatively. As such, Luk was given plenty of breathing room and was able to utilize the horizontal hierarchical system to his advantage. Whenever Luk had an idea, he built it, then went directly to Hoffman or Ly for feedback. Some ideas they liked, others they didn't, but they always offered critique and encouragement. He luxuriated in this freedom, as it was "not your typical company back then. Having the ability to do whatever I wanted enabled me to work hard *and* enjoy what I did." While his technical skills were nearly unmatched, Luk realized that his leadership ability was not as strong, and he worked on this aspect of his growth tirelessly with both Hoffman and Ly. When he was promoted to leading his own team, he realized that he did not yet have the skill set required to do so effectively. Instead of shirking responsibility, however, he hired an additional team manager to complement his style.

Luk's leadership style could be characterized as independent and open at the same time, with a more solid foundation when leading a technical team. When the iPhone came out in 2007, Luk was immediately hooked. Enamored with the new feature of 'applications', Luk saw their potential and strongly wanted to build one to enable LinkedIn to go mobile. However, his managers in contrast believed the biggest advantage of the iPhone was its browser and the associated access to web pages. Luk approached his boss, eager to get started on this mobile application of LinkedIn, but was surprised when he encountered resistance. "Why do we need a mobile-optimized version of LinkedIn? Users have the ability to access our webpage and this is likely to be a waste of time." Luk experienced even more resistance from others with similar sentiments who believed that "nobody would use it. They would just use the browser version of LinkedIn over wifi." These opinions may seem foolish now in hindsight, but these were the popular sentiments of the day. Making full use of his freedom, Luk chose to look at these rebukes in another light. "If the boss said 'No', I just interpreted that to mean 'Just don't do it during business hours.'" This type of creative yet driven approach enabled Luk to complete the entire application over a 3-day weekend. Once it was made, Hoffman and the rest of the executive team loved it, and Luk was appointed as Head of LinkedIn Mobile. They were one of the first companies to produce a dedicated iPhone app, and LinkedIn Mobile would go on to become wildly successful over the coming years.

Going from 0 to 1 and the Founding of Presdo

As LinkedIn continued along its path of success and exponential growth, Luk's interest in the company began to wane. He distinctly remembers his motivation for leaving the company: "LinkedIn was expanding and simply getting too big. I enjoy knowing everybody in my workplace, and I couldn't keep track of a thousand people." Over the course of his career with them, LinkedIn had grown from a group of around 30 to over a thousand, with their user base

increasing from 1.6 million to over 40 million users.[1] At that size, Luk realized, companies have to change their operating style in order to function properly. Management had necessarily begun to operate in a more hierarchical way, and the chaotic, creative environment that had first attracted Luk to LinkedIn was no longer present. Having no interest in management, he began to feel restless. Nonetheless, he was able to content himself with side projects and his own ambition to make excellent products. Luckily for him, an excellent opportunity was about to come his way.

As a LinkedIn employee, Luk still operated with much of the freedom that he had back when the company was a fraction of the size. His reputation within LinkedIn was excellent and he was admired by many of his peers and co-workers. Indeed, many people would have loved to reach the level of success that Luk had achieved. However, instead of helping his career, Luk realized that this admiration was hindering his personal growth. "Nobody would try to criticize me. Even when I made a mistake! They were intimidated by my track record." This was especially worrisome to Luk, a firm believer that an environment without critique is not an environment conducive to improvement. Luk was only 28; he was not done developing himself and felt that he had much more to offer the world. He was just getting started, and after some brief reflection, he uncovered where his inspiration to join LinkedIn had originated—the start-up environment. He wanted to return to a company that was at the beginning, a company that was going from 0 to 1 rather than from 1 to 1000. However, he didn't want to join just any start-up—he wanted to do the starting up himself. When Eric Ly, the man who first brought Luk to LinkedIn, approached him with an idea for a company that would revolutionize intra-company communication in May of 2009, the word 'Yes' was out of Luk's mouth almost before Ly had finished the first pitch.

Ly and Luk founded Presdo almost immediately thereafter, and life returned to the way Luk liked it—hard work and chaotic hours. Presdo was originally an idea for a time management software that enabled people to schedule meetings both within a company as well as externally. This was an issue that Luk and Ly had painfully undergone while working at LinkedIn. "You had to find times and meeting places individually and then put in a lot of thought on how to synchronize all those schedules and figure out what worked best for everyone. It was crazy!" After refining their idea and bootstrapping the company with their own money, Luk and Ly made the decision to focus on preserving their intellectual freedom. They didn't go after additional funding and instead decided to retain full control of their company and idea, allowing for free pivoting and the option to focus on mobile if it became relevant.

Although the founders initially intended to make Presdo a consumer product, a weekend tech conference heard about their idea and wanted to use the product to schedule meetings and lectures with guests. Luk and Ly were excited to launch their product and get it into the hands of users, but it wasn't complete by any means. Painstakingly reminiscent of the launch of the mobile application back at LinkedIn, they cranked out the entire product in a single weekend. They did well, and it wasn't long after this that Presdo was noticed by Salesforce. Presdo wasn't

[1] Timeline. Linkedin: A Short Historical Review, 2014, web.archive.org/web/20160427110626/http://www.tiki-toki.com/timeline/entry/347471/Linkedin-A-Short-Historical-Review/.

for sale, the two founders weren't interested in investors, so Ly hashed out a business deal that provided them with nearly a million dollars of seed money to get the company running while maintaining that essential element of freedom. Using this money, Luk hired on another engineer to help create a functional software for Salesforce to integrate into their business model.

However, Luk was yet again disenchanted with what they were doing with Salesforce. The company was simply too big, and being the individualistic person he is, Luk simply wasn't suited to doing a job that required the logistical navigation that Salesforce required of Presdo. Luk dreaded integrating Presdo's Ruby on Rails code into Salesforce's Java codebase, but the contract Ly had established was only for a few months, and the money was good enough to convince him to tough it out. A massive company, Salesforce wasn't as agile as Luk had hoped for. He was shocked when he was asked not to work on weekends because his work was causing difficulties for other employees who had to run the story point calculations. Reaching that same stagnation point that he experienced back at LinkedIn, Luk began shifting his time more towards side-projects for Presdo. His efforts rarely go to waste, and Presdo came out with their first marketable product in the form of conference software. Presdo completed their Salesforce contract, and started making money which enabled the team to rent office space and move to Mountain View, California.

This booming success would not last forever, as an error Presdo had made over a year ago would soon come back to haunt them. Competitors began to spring up, but the efficient team of three was able to compete. However, these competitors had raised a lot of money, and because of that, they were eventually able to out hire and outwork the small team at Presdo. "Knowing what I know now, I would have raised money back at the start and used that to scale the product. When we first went to market, we were the only player." At the time, Luk and Ly had wanted to preserve their ownership and agility of the company. Luk and Ly learned that the power of funding can be essential to success in a rapidly developing market.

A Value Shift And the Rise of Edmodo

In early February 2011, Luk received a call from his uncle in Hong Kong. Both Luk and his cousin had grown up as their parents' only children, and they had spent a large amount of time together. As such, he treated his cousin like a brother, and his uncle like a second father. His uncle had bad news: he had been diagnosed with cancer, and had been given only 6 months to live. Recognizing this could be his final chance to see his uncle, Luk dropped everything he was working on at Presdo and flew back to Hong Kong to be with his family.

The day before Chinese New Year in Hong Kong, Luk came down with a severe fever. Unfortunately, all the local medical centers were closed for Chinese New Year, so he was not able to get the proper medical attention until 3 days later. By that time, Luk's fever had grown so severe that he was nearly unable to walk and recalls that it was a miracle that he even made it to the hospital. After diagnosing him with Swine Flu, Luk's doctor told him that, because the

medicine was only effective in the first 48 hours of the infection, there was nothing they could do to help. Luk was given only a 50% chance of survival. For two weeks, he lay bedridden, entirely reliant on the care of his parents. He remembers waking up in a haze, not really understanding what was happening, barely managing to eat and drink whatever happened to be next to him before he passed out again. The only other memory he has of those days was receiving a call from a friend with the good news that LinkedIn had just filed their S-1 in anticipation of going public—he was going to make a lot of money! This excellent news rang hollow in Luk's ears. All of a sudden, money did not seem as meaningful when he was not sure if he would even make it back to California alive.

Fortunately, Luk was lucky enough to make a full recovery. Once he made it back to Silicon Valley and took some time to reflect, he realized that this experience had radically shifted his values. When faced with death, money and status no longer seemed like the goal of his entrepreneurial career. Suddenly relationships, family, and social good suddenly seemed much more important to leading a fulfilling life. As a result, Luk's job at Presdo lost much of its luster and he decided to find a route more aligned with his newfound values.

On the journey for something more meaningful, Luk went to Reid Hoffman, his old boss at LinkedIn, for advice. Hoffman happened to be on the board of directors for a start-up in the education-tech space called Edmodo and saw this company as the perfect fit for Luk. He recommended Luk to its founders, and in July of 2013, Luk became a part of the Edmodo team. Edmodo was founded in 2008 by school district employees and sought to do for education what had already been done for shopping for clothes online: scaling via intelligent recommendations. Just as patrons could now be guided through the majority of the clothes shopping process with smart suggestions remembering their preferences, Edmodo wanted to use artificial intelligence to guide students through the majority of the curriculum. Edmodo's founders had recognized that this system allows salespeople to drastically increase their customer base, as they only had to handle a fraction of the sales cycle. Likewise, they saw an opportunity whereby teachers would only be needed to *actually teach*, and the best teachers would be able to get their lessons in front of many more students than before.

By the time Luk joined, Edmodo had hit 15 million users, up from just 5 million the year before, and its explosive growth seemed promising. However, they struggled to monetize the software, which had been produced with the Freemium model. Charging students, who were largely teenagers, was not a viable option, so they decided to target app creators and teachers. Edmodo hoped that teachers would appreciate the freedom to teach their class as they wish, and would either buy the software themselves or advocate for it to their districts.

However, Edmodo's efforts to capitalize on this market came up short time and time again. Their paid app store, from which Edmodo pocketed a percent of the sale price, was only ever seen by 10% of users, and it failed to bring in significant revenue.[2] An additional standardized testing product titled Snapshot was released the following year, but it also fell short of the widespread adoption and revenue Luk was looking for to significantly impact the education space.[4] As Edmodo continued to push against the saturation point of the American market and

[2] EdSurge.com, *Can Edmodo Turn Virality into Profitability*, 21 June 2016

see growth slow without the long-awaited explosion of revenue, Luk began to realize just how difficult the education market was to crack. Seeing the institutionalized systems he had to work with, Luk understood that the resources and systems were simply not there for him to accomplish his goals at Edmodo.

Faced with these challenges, Luk had a lightbulb moment regarding his work at Edmodo while reading the book *Hillbilly Elegy*. This book pushed Luk to recognize that most people did not need more technology or fancy tools to further their education; what they needed was a quiet space to work and personal drive. When viewed through this lens, it was suddenly clear to him that Edmodo was not at the right time to achieve its mission—the very same vision of building social value that had inspired him to leave Presdo for the education field was now leading him away. The importance of relationships that impacted him so strongly after his brush with death were still unanswered. His mind once again returned to the drawing board, and in his free time he began thinking about the problems with the current models of social networking. In January 2017, Luk was confident it was time to move on, so he left to pursue a his newest venture: Loop.

In the Loop (Inc.)

Just as Luk was beginning to think more about social networking and yearn once again for the fresh startup environment, he happened to meet another entrepreneur by the name of Vincent Yang. In 2016, Yang approached him with sentiments strikingly similar to some Luk already had brewing. Both men believed in two things: the necessity of developing for the ever-increasing smartphone market, and the significance of social networking.

Both Luk and Yang had noticed that most smartphone users had multiple messaging apps, so they decided to create a social chat-based application that would be able to stake some claim in the dispersed market. Their novel approach was based on the visualization of an individual's social network not as a line graph as most apps do, but rather as a series of Venn diagram-esque overlapping circles representing groups with which a person is involved. People act differently based on their environment, so why not create a chat revolving around an environment? That way, people can express themselves with the proper amount of candor on multiple platforms across many contexts.

The Loop team was driven to create an absolutely stellar product. After all, they were trying to steal market share from heavyweights such as Facebook, iMessage, GroupMe, Slack, and many others. From their experience, Luk and Yang recognized that starting a company is much different than joining an existing start-up, and after some reflection on past experience, they established Loop's three foundational pillars: See different, think different, act different. They needed a company that could distinguish itself from the competition. Expanding on these pillars, they made a point to incorporate one of the critical components Luk had learned from LinkedIn—extreme speed. They knew how difficult it is to predict success, so to maximize the chance of success one must "iterate more, iterate faster, and iterate smarter."

Another critical element to Loop's pillars is a unique definition of learning: "We always have to remind ourselves that the more you know, the more you limit yourself," Luk explained as he

pointed at their guiding values. “Believe that your knowledge can be wrong, and be willing to ‘unlearn’ in order to make progress.” This mantra echoes Reid Hoffman’s advice from years ago, which persuaded Luk to abandon his pursuit of an MBA. There are certain times when knowledge can lead to provincial thinking and limit creativity, and Luk did not want that to happen at Loop.

So as not to not repeat his venture-free experience at Presdo, Loop raised funds from multiple venture capital firms—they made sure to raise sufficient to allow for down-the-line scaling and creativity. Both entrepreneurs had excellent track records, and they had no trouble raising close to a $5 million seed round.

Launching Loop

Colleges are extremely social spaces filled with smartphones, so Luk and Yang decided to design their app for college students. It had been a few years since their graduation, and they had no user data or information that they truly trusted. Over the course of the following few months, Luk and Yang spent an estimated 200 hours asking college students for their thoughts on the messaging field and their prototype. These interviews were essential to guiding the product direction when every decision made had a significant impact on Loop’s overall trajectory. Furthermore, every Saturday morning, the team would meet to try out other messaging and social networking app, studying their competition enabled the team to see who was doing new things, what was working well, and which tidbits sparked inspiration for new Loop features.

As is true with any company, turning research into a product was not a perfect system. Their first two prototypes did not stand up to the standards Luk and Yang set for their initial launch. Both products had failed to satisfy the lofty ambitions that drove them to leave their previous jobs. As a result, rather than launching a product they were not 100% confident about, they decided to return to the drawing board. These initial products were never brought to market. Finally, their third prototype was a beta tested success, so they created a market-ready application for group messaging on campuses. They launched the app, which they named Loop.social in August 2017. They had not fully flushed out their position, but wanted to launch an app simply to learn from it. Loop.social had great initial traction, with a close to 50% conversion rate. On top of that, 60% of the people who went to the landing page signed up. However, retention was lacking, and as the semester progressed the college community on the app faded severely.[3]

As a learning experience, this initial app launch was perfect. The team found good methods for increasing their customer acquisition, and learned something vital for future development—people really want to meet other people. Additional information was gleaned about the college student consumer market, timing is key. During the start of school, acquiring customers is fast and relatively straightforward. However, it becomes significantly more difficult to acquire new

[3] See Exhibit 5: User retention for Loop.social

users mid-semester. Launching a promotional campaign or new feature on top of Loop.social now would be a wasted opportunity. With the start of the semester passed, the team had time to keep those lessons in mind and develop another app.

They developed an entirely new application, and called it DoubleDouble. DoubleDouble took advantage of something that the Loop team had noticed, that many social experiences are optimized around 4 people—Ubers are for 4 people, dinner tables are for 4 people, and people enjoy going on double dates. Additionally, people feel more comfortable meeting strangers when they are accompanied with friends they know and trust. DoubleDouble is a social application, in which you pair up with a friend, then meet other pairs in your area. If a match is made, a time-limited chat is formed between all 4 individuals involved. If the chat is unused, then it disappears, but if everyone speaks up and is engaged, an algorithm detects that you have formed a connection, and a permanent group is formed.

Decision Time

Holding true to Luk's belief that some of the best results are driven by intense deadlines, the Loop team periodically performs sprints, where all work for one week is devoted to the development of a new product or feature.[4] One sprint previously resulted in the creation of a new mode for the original Loop app, where you can invite people to an anonymous "incognito" conversation. Another sprint led to creation of DoubleDouble. Now that the team's app-making infrastructure is firmly established and becoming progressively more well-tuned, the team wanted to do another sprint. This, however, was subject to an important reality: a new product or feature would take a significant amount of time and resources to make production-ready, and they wouldn't want to release an incomplete app or overly dilute their efforts across too many products this early on.

Before they could address that point, they had to ensure the successful trajectory of DoubleDouble. When launching Loop.social, they had noticed a disparity between the user tests and the actual product use. Although people had been excited about the product while face-to-face with Luk, they lost interest when the time came to actually use the product. "We were too good of salespeople," Luk noted. Furthermore, Luk realized that he had been spoiled when working at companies with existing customer bases, and that it was in reality exceptionally hard to attract and build new, loyal users. To remedy these, Luk and Yang created three key metrics that would be the final determinant of DoubleDouble's path forward: 1) the landing page conversion rate, 2) the percent of users getting a match in the first week, and 3) the ratio of male to female users. If, 60 days after the product launch, any one of these three stats didn't stand up to the bare minimum put in place by the team, then the app would be retracted, either to be refactored and relaunched, or to make room for another new product.

[4] Knapp, Jake, et al. *Sprint: How to Solve Big Problems and Test New Ideas in Just Five Days*. Bantam Press, 2016.

This left the Loop team at a crossroads. Loop.social was mediocre, and DoubleDouble was predominantly an unknown. They wanted to develop another product, but at its current size, their engineering team only has the bandwidth to maintain 1.5 to 2 products at once. Pursuing additional funding now would allow them to expand the team and increase their development capacity up to 3 or more concurrent apps. However, as both apps continue to mature over the next 6 months, Loop's company valuation might increase significantly. If this were to happen, Loop would receive a dramatically better term sheet with venture capitalists.

Increasing their capacity now, aligns with Luk and Yang's value of iterative speed. But Luk and Ly have no doubt in their ability to raise sufficient funds, and it is difficult to write-off the possibility of next-level success in only a few months if DoubleDouble takes off. Furthermore, if they do wait to fundraise, they will be forced to either discontinue development of Loop.social before it receives the boost from the Spring semester, or postpone their new product aspirations in favor of what could very well be a dead-end product.

Luk knows that he has had to make many critical decisions with insufficient information to get where he is today. This one is no different.

Exhibit 1: LinkedIn Revenue: 2009 through 2015

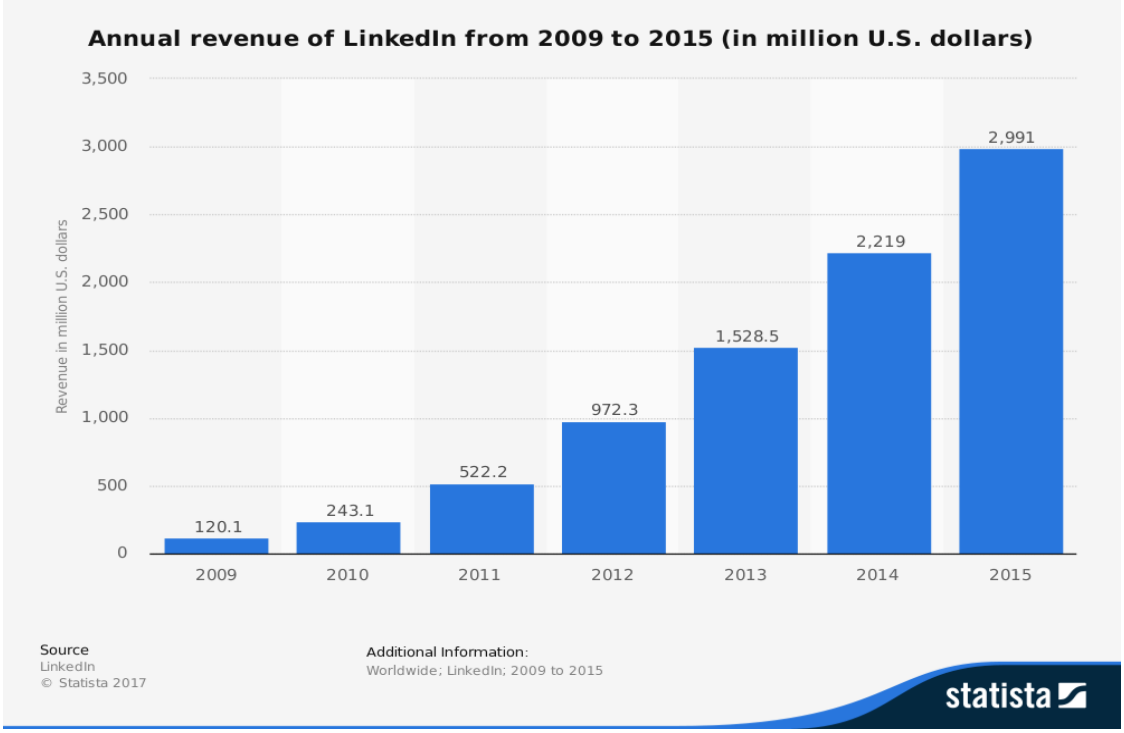


Exhibit 2: Quantity of LinkedIn users, 2009 through 2015

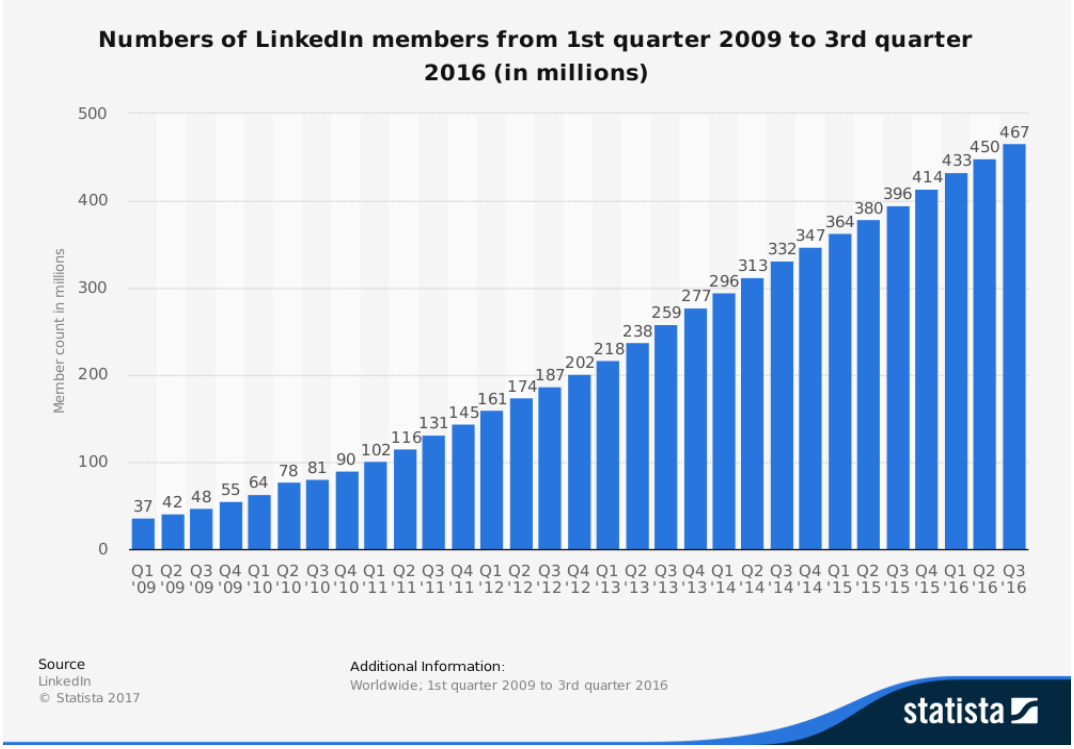


Exhibit 3: Edmodo early user adoption rates

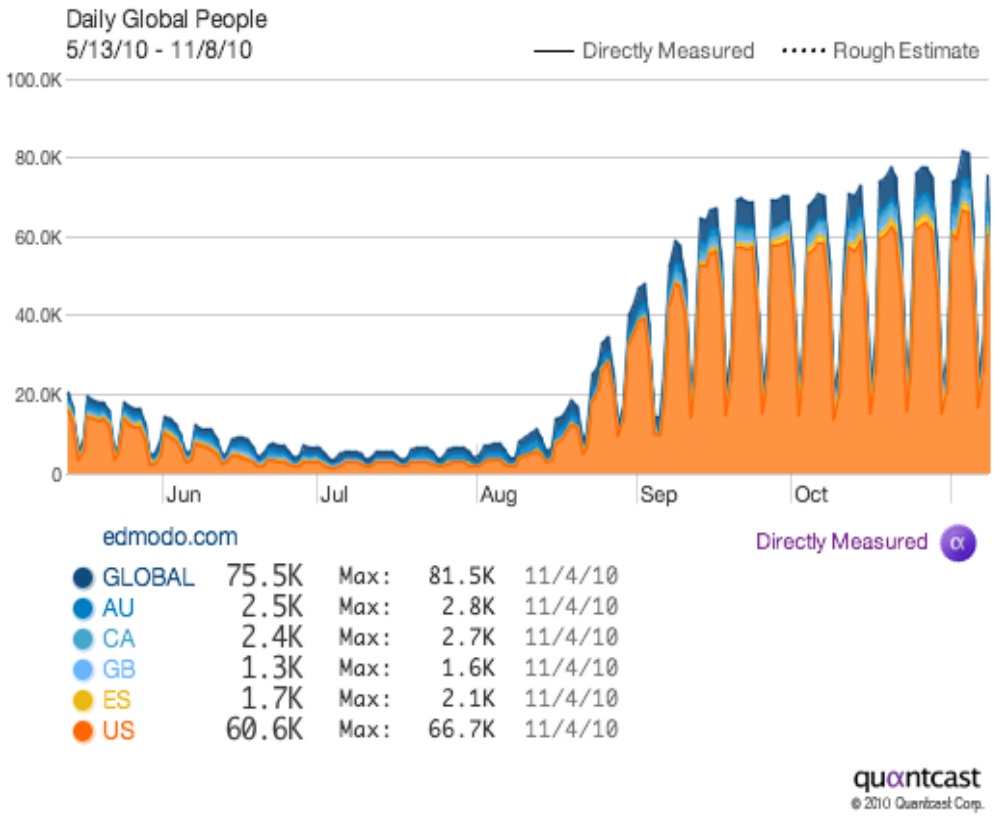


Exhibit 4: User adoption for Loop.social, Loop Inc's initial product

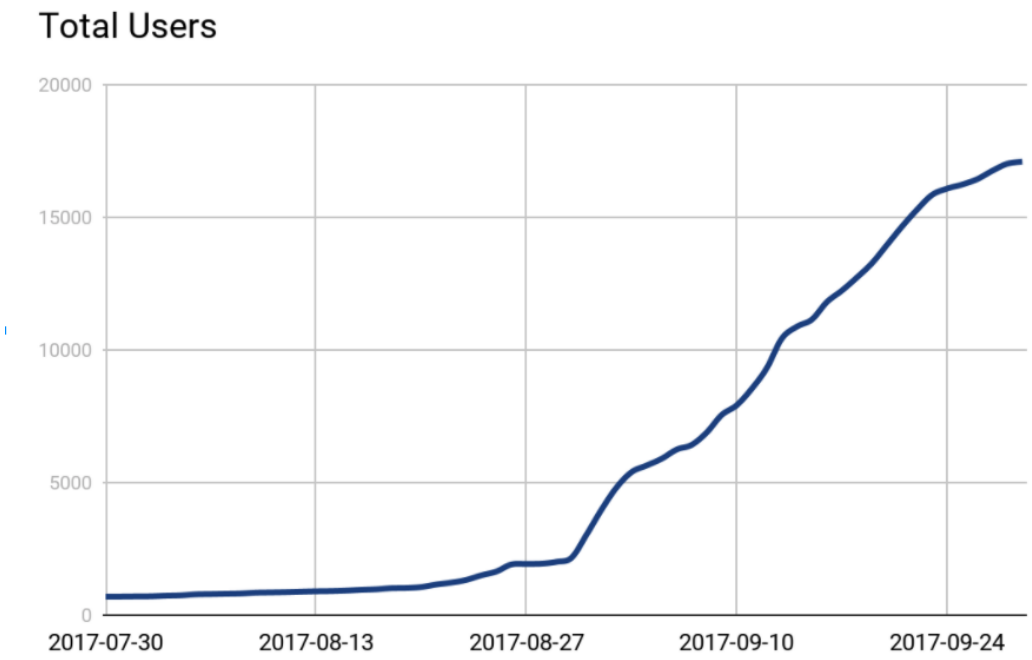
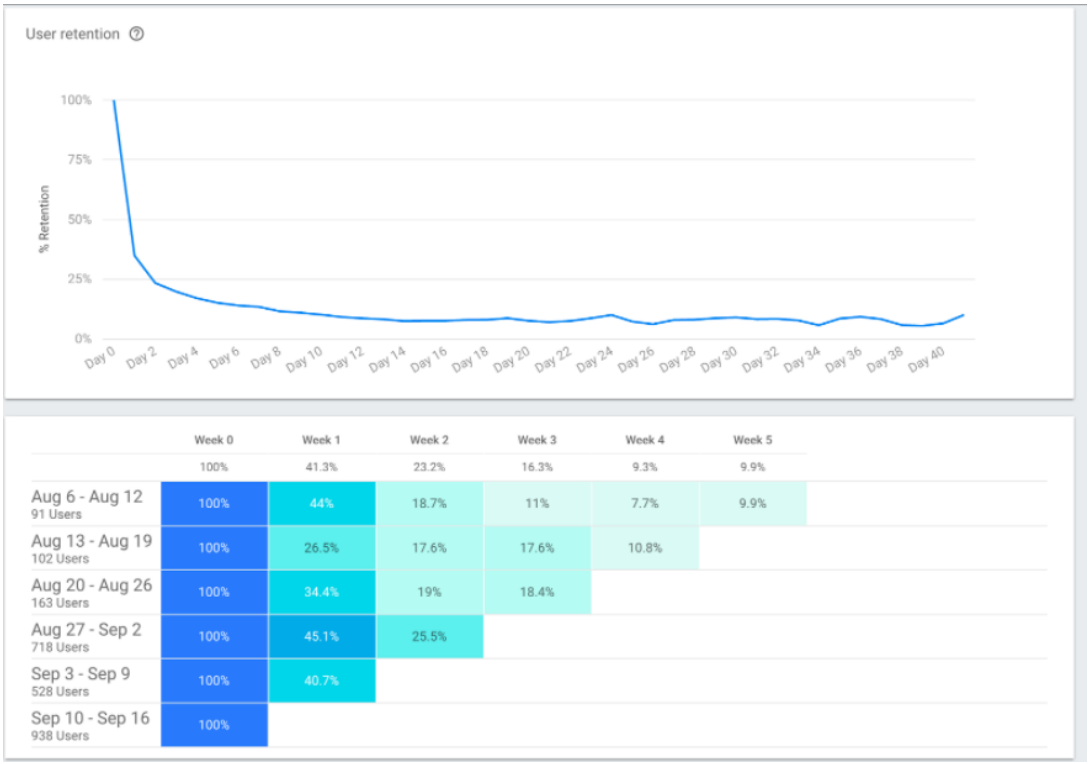


Exhibit 5: User retention for Loop.social



	Week 0	Week 1	Week 2	Week 3	Week 4	Week 5
	100%	41.3%	23.2%	16.3%	9.3%	9.9%
Aug 6 - Aug 12 91 Users	100%	44%	18.7%	11%	7.7%	9.9%
Aug 13 - Aug 19 102 Users	100%	26.5%	17.6%	17.6%	10.8%	
Aug 20 - Aug 26 163 Users	100%	34.4%	19%	18.4%		
Aug 27 - Sep 2 718 Users	100%	45.1%	25.5%			
Sep 3 - Sep 9 528 Users	100%	40.7%				
Sep 10 - Sep 16 938 Users	100%					

Berkeley Leadership Case Series

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Liza Wang - Entrepreneur, VC, and Investor

> *"Entrepreneurship is not for the smartest, it's for people who are willing to work hard and to improve themselves."* – Liza Wang

In May 2007, Liza Wang's decision to leave Procter and Gamble to focus full time on her young start-up was met with disdain from her family and friends, who viewed the venture as a fleeting idea and an unstable career. Her "rebellious attitude by nature" set her on the path to prove them wrong.

Background

Liza Wang was born in Hong Kong in 1982 to a traditional Cantonese family. When time came to decide where to go to college, Wang declined an offer from Oxford University and instead enrolled in The Chinese University of Hong Kong (CUHK) for a Bachelor of Business Administration – specialized in Marketing and Finance. Although Wang chose to remain in Hong Kong to stay close to her family, she jumped on the opportunity to attend The University of California, Berkeley in 2003 as part of an Education Abroad Program. In California, she fell in love with the entrepreneurial spirit that surrounded the Bay Area. Wang never thought she would return to Berkeley, or even back to America in general.

After graduating from CUHK in 2005, Wang applied and was offered a job in the Marketing and Brand Management department at Procter and Gamble (P&G). Her ambition was to become one of their first female senior executives. Wang was exposed to the digital marketing industry while at P&G, and she soon realized that the methodology the company was using had not progressed. She felt little thought was given to the new digital and mobile trends. As an ambitious twenty-five-year-old, Wang realized that she could do more for the digital marketing industry than what she was learning at P&G. Through mutual connections she rekindled her friendship with some colleagues from her time at CUHK, and together they sought out to explore options in the then-immature digital marketing sector. Digital marketing represented less than 2% of the total market at the time. In March of 2007 Wang co-founded the company Guru Online along with Mr. Yip Shek Lun (Alan Yip), Mr. Ng Chi Fung (Jeff Ng), and Ms. Wan Wai Ting (Karin Wan).

This case was prepared in the Sutardja Center for Entrepreneurship & Technology by lecturer Stephen Torres, editors Thomas Ferry and Mudit Goyal, and case team Ma Siew Hong, Jenny Liu, Aayush Patel, Itzel Romero and Zhou Ming Yang prepared this case. It was reviewed and approved prior to publication by a company designate. Funding for the development of this case was provided by the University of California, Berkeley and not by the company. Berkeley Engineering cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

Procter and Gamble

From May 2005 through May 2007 at P&G, Wang developed a strong understanding of the work culture inherent to most large industries in Hong Kong. Wang really appreciated her company's marketing and management philosophy. She considers it the "training ground" for all types of management. However, she felt marketers and related practitioners at P&G were extremely conservative towards new trends without developed best practices. Although she loved the training philosophy, she couldn't help but notice that it was covering material that was not relevant to her generation. Wang was not accustomed to relying on TV and print as information sources. She was reliant on the internet. Experienced industry veterans seemed to lack the necessary openness for innovation and embrace the digital trend

As a result, Wang started thinking about new media planning and marketing strategies that were more relevant to her generation. At the time, Hong Kong did not have Facebook or other forms of internet marketing, and Wang saw an opportunity for a new kind of company. She and her founders knew that the only way to get ahead was to find a small yet profitable niche within the existing industry conglomerates in Hong Kong, and digital marketing was that perfect fit.

Hong Kong's Digital Advertising Industry

Hong Kong's advertising industry was growing steadily, with advertising expenditures rising annually. The advertising industry contributed a gross added value of 5 billion Hong Kong dollars (HK$) in 2007 (Exhibit 1). Total advertising expenditures amounted to HK$25 billion in 2007, which represented an 11% increase over the previous year. According to market forecasts, this was set to increase steadily over the subsequent years (Exhibit 2). This increase in local advertising expenditures was fueled by disposable income growth in Hong Kong, on which corporate budget decisions on advertising spending is dependent on. This signified a promising future for the advertising industry.

Non-digital print media, which included newspapers and magazines, were traditionally the major advertising medium in Hong Kong, followed by television. In 2009, internet advertising accounted for 5.1% of all advertising expenditures in the country (Exhibit 3). As internet access became more widespread in Hong Kong in 2009, approximately 69.4% of the city's population was using the internet (Exhibit 4). Based on this data, the demand for internet advertising was predicted to increase. This presented potential opportunities for a digital advertising firm to capitalize on a growing market space.

The turn of the decade also saw rapidly changing trends in the digital advertising industry. With the advent of technology, as well as the increasing prevalence of smartphones and social media, the role of digital advertising continued an upward trajectory globally and became the fastest growing advertising medium (Exhibit 5). This meant that digital advertising companies needed to be nimble enough to adapt to the changing demands of clients and the target audience, while also maintaining the same standards of quality and service as before. It was necessary for market players to be aware that they were in a constantly evolving market space and needed to constantly reinvent themselves in order to compete successfully.

Guru Online

Once Wang and her co-founders became invested in Guru Online full time in May 2007, they struggled to find support from any professional resource. The startup culture in Hong Kong did

not have the same strong support system of the Silicon Valley. Most industry sectors were dominated by well-established market players that had already garnered respect and power through many years of experience. Moreover, Hong Kong's industry culture valued seniority over innovation and was generally unaccepting of small companies trying to make a change. This meant high barriers to entry that made it difficult for small companies to outshine existing players even if upstart had an accurate market position and a sound business strategy.

Guru Online had several direct competitors in the industry that were more established, which lead Wang to operate Guru Online at very low burn rate for the first nine months. The founders chose to not pay themselves and instead focused on maximizing profit for the company. While there were established players in digital advertising, Wang and her co-founders saw a gap in which they could capitalize. Current players engaged with individual website owners on a highly transactional basis, and none of Wang's competitors secured exclusive rights for advertising placements on the owners' sites. Gaining exclusivity became the key strategy and provided a competitive edge. Obtaining exclusive rights to advertising placements on popular websites not only proved to give Guru Online a pricing advantage and bargaining power, but it also was a key resource to engage with advertisers.

Engaging website owners turned out to be less of a struggle than engaging advertisers. Advertisers didn't trust such an inexperienced team, making rejection common. On the other hand, website owners tended to be younger, generally in their twenties, and the Guru Online team was able to connect with them. Through persuasion, minimum guarantees, and sheer grit, the team obtained exclusivity to fifty popular websites in Hong Kong. That opened the path to the next step: engaging advertisers.

First Hurdle: Threatening Call from a Competitor

As Guru Online was gaining traction, it started drawing unwanted attention from competitors in the industry. One evening, the founders received a call from an established competitor claiming that they would send an email the next day to advertisers and potential clients, stating how Guru Online was not a legitimate company. They also said that the email would be signed by several established companies in the industry, as well as by a reputable third-party measurement agency. The consequence would have been dire to a fledgling company like Guru Online. They risked losing the trust of their clients and there was no way they would have been able to secure subsequent meetings with advertisers if they had suffered such damage to their credibility.

Faced with the danger of being forced to give up on the digital advertising market, Wang and her founding team did not have much time to react. Without the help of a professional lawyer, they had to do their own research on how to craft a legal document. The team also had to strategize who they were going to send the document to. Would it have helped to issue the letter to their competitors? Clearly not, since their sole purpose was to drive Guru Online out of the industry. Instead, the team targeted the third-party measurement company which had much more to lose. A legal letter was drafted overnight and sent via email to the General Manager of the Hong Kong branch of the certification agency. The email explained that Guru Online had all required legal documentation for its operations and that legal actions would be taken against them should they partake in the sending of the defamatory email campaign as outlined by Guru Online's competitor. Fearing the letter would not reach the General Manager in time for him to intervene, the team printed it and slid it under his office door at 2AM.

The legal letter was successful and the defamatory email about Guru Online was never sent out. While competitors continued to badmouth Guru Online after the incident, Wang understood that such actions could not be prevented. Instead, she realized that learning how to properly manage

and control damages during times of crisis was more important than finding ways to prevent them.

Amidst the unpleasant experience the team remained positive, seeing a silver lining in the situation. The incident was a sign that the industry they had decided to go into needed to be disrupted. Existing players could carry out anything just to frighten newcomers and prevent them from entering the industry. If Guru Online could avert these tactics and maintain their position, they will be able to establish themselves and forge a strong competitive edge.

Getting Tripped While Striding

Four years into the business, everything was rosy for Guru Online as it experienced extremely fast growth. The business doubled in size every year, along with the growth came increasing revenues, staff expansion, and a larger office space. As the company moved into its new offices, the employee headcount expanded to 40 staff members and the founders formed the first middle management team.

As the founding team was starting to get comfortable and planning to spend more time on strategy instead of daily execution, disaster struck. A few months after the implementation of middle management, the entire middle management team resigned. With cash all locked up due to the rental deposit, renovation fees, and costs of moving into the new office, the company had little room for error. Losing key members took its toll on the company which lost important clients and recorded its first financial loss in three years. To make matters worse, there was panic among the remaining employees because of their dependence on the middle management team. Consequently, the founders found themselves detached from their staff.

The only remedy was for them to get back to the basics. To reconnect with the employees and forge a greater sense of teamwork. Wang and her team decided to lead by example and worked extra hours alongside their staff to make ends meet. The extra effort paid off as the company recorded its highest revenue to date just a few months after the crisis.

Wang discovered afterwards that a Chinese company had bought out the entire middle management team to start another company to compete directly with Guru Online. Along with the managers, the Guru Online also lost much of its intellectual property in the form of presentation materials, client database, and company information. Limited funding and the lack of an established legal structure to protect the company's intellectual property meant that legal actions would prove to be of little value. Wang felt that the company would not survive the drain of a lawsuit, and the founding team continued moving forward and set their sights on their own path. They realized that the only solution was to work hard and constantly improve the company. As Wang stated, "People can copy and steal current materials, but they cannot steal future ones. Our materials will change and improve." Staying ahead of competition was the only way to survive in her mind.

To Wang, the competition, challenges, and setbacks were also fun aspects of entrepreneurship. She saw crisis management not merely as an opportunity to grow as a company, but also an opportunity for her to grow personally. Dealing with challenges and uncertainties, working hard, and reflecting on mistakes is how Wang believes entrepreneurs grow. The compounding effect of hard work and continuous learning is what defines a successful entrepreneur in her view.

Explosive Growth

While Guru Online experienced steady growth for many years, its business was limited to website design, banner design, and advertisement banner placement. The digital advertising sector was still a very small segment of the entire advertising industry, accounting for only 2% of the total market size. The tipping point for the company was Facebook's entrance into Asia. Wang was an early user of Facebook and quickly saw its potential impact on the industry. Following the viral growth of Facebook and other social media platforms, Guru Online secured an early mover's advantage by promoting Facebook to clients. Guru Online was the first in the region to help clients deliver Facebook campaigns. This was significant in providing the fuel to keep it on an upward trajectory.

Funding

As a service based company, Guru Online did not require as much funding as a product based company. In fact, Guru Online grew with only the initial capital injection from its founders. About four years in, the company had a good business model that the founders felt was worth developing further. Further business model development would require cash, so the founders went out to look for it. After months of engaging investors, the founders did not find a deal they were happy with, so instead of settling for something they felt like was less than they deserved they turned their attention back to operations.

A year later, Guru Online transitioned into its next developmental stage and investors started streaming in. Wang and her co-founders were then faced with an important decision. Did they really require funding? And if so, from which source should they take it? The question of equity investment, acquisition, exit, or going public reigned as the founders were faced with numerous offers.

The team decided that while the company was not in dire need of cash, but a strategic investor would benefit the company's growth and provide a strong backing to stage an eventual initial public offering (IPO). Huayi Brothers International Investment Ltd., led by Mr. Zhonglei Wang, was brought in as a strategic investor, and Wang was put on the board as a Non-Executive Director.

Huayi Brothers International Investment Ltd. is a subsidiary to Huayi Brothers Media Corporation, media giants and China's largest privately held film conglomerate. The investment not only gifted Guru Online broader national recognition and a stronger brand name in preparation for its IPO, but it also opened the Mainland China market to the company. While Guru Online still had to lay the groundwork and secure the deals, opportunities with important China clients became possible thanks to their new strategic investor. Starting with the governments of Chinese cities that engaged Guru Online to promote their cities globally, the floodgate opened and the Hangzhou tourism board became a client. This was quickly followed by the tourism boards of Beijing, Shanxi, the Nanjing Youth Olympics, and several private companies. Guru Online's total revenue from the Chinese market increased from 0% to 20% over the next two years.

IPO

On May 29, 2015, Guru Online was officially listed on Hong Kong Stock Exchange's Growth Enterprise Market (GEM) Board with net proceeds approximating HK$91.8 million. While service provider companies in Hong Kong generally yield lower Price to Earnings (P/E) ratios, Guru Online

was listed as a tech and internet company. The listing allowed the company to reap the rewards of a higher P/E ratio. Guru Online's success was as much due to the dedication and hard work of the founding team as to the timing of its resurgence since Asia had few internet companies at the time.

Guru Online's IPO also marked the end of Wang's eight-year journey with the company she founded. A month after the company went public, Wang resigned from her position as non-executive director. Wang does not consider IPOs to be the end of a company, but rather another new beginning to further its growth. However, Wang married and her husband lived and worked in the Bay Area. The couple was faced with the tough decision of choosing their new family's home. Although Wang greatly enjoyed her time at Guru Online and had all her family and friends in Greater China, she made the tough decision of resigning from Guru Online to move to Silicon Valley.

In the first few months of moving to Silicon Valley, Wang felt as if she was starting everything all over again. Fascinated by the Valley's product and platform companies, Wang eagerly learned and soon developed an effective way to help local startups on their growth strategy. She put her newly acquired knowledge to test by consulting for various startups.

One of her consulting experiences included a Growth and Marketing mission at the educational network Edmodo in 2016. She helped them achieve 4x growth in a 6-month period, and she helped the team drastically increase user traffic. Pregnant, she worked until the last day before her daughter was born, and then decided to become a full-time mom.

Angels of the Bay and Long Venture Partners

Wang always wanted to be an Angel Investor, but at Guru Online, she was unable to focus on investing. After moving to California, she had the opportunity to focus on her career as an Angel Investor full time while also taking care of her family. In October 2017, Wang decided that she wanted to expand her influence in the investing field and took a job as a Venture Capitalist for Long Venture Partners. She has been able to provide seed funding for numerous startups. Because of her upbringing in Hong Kong, Wang remains a firm advocate of entrepreneurship in the Greater China region, frequently extending her influence to help startups within the Asian community.

As a Venture Capitalist, Wang interacts with many technology startups. She focuses in the machine learning and artificial intelligence software field. She enjoys her time outside of the office when she is working directly with the founders because it gives her the opportunity to see how they work and communicate with others. She firmly believes that the team is a critical factor for determining the startup's success. She also works with the rest of the VC board at her firm to analyze financials and product-market fit of their prospective startup investments.

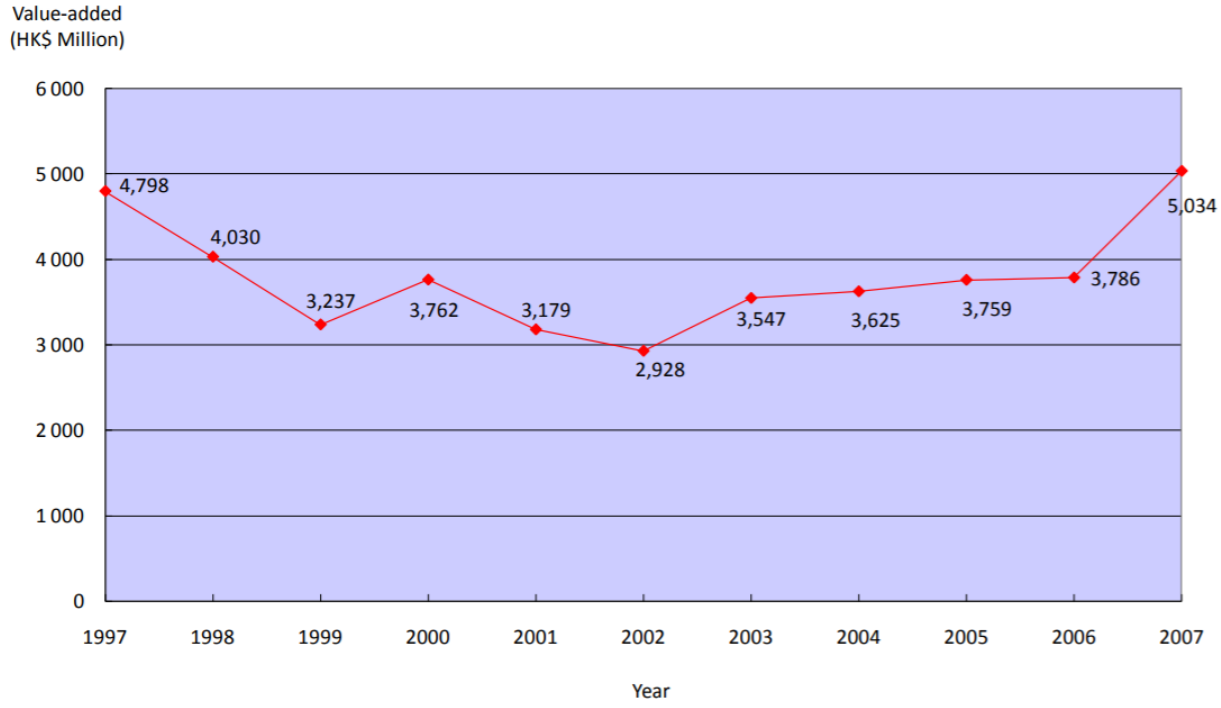
Advice for the Young Entrepreneur

As Wang enters the VC industry, she has a few key pieces of advice for young, college students aspiring to become entrepreneurs. What she believes is most important is not to develop life presets or limitations for yourself. Anything can happen in life, which is exactly how revolutionary ideas can emerge. If Wang had stuck onto her original plan of staying in Hong Kong, finding a traditional job, and building a family, she would have never embarked on her adventurous and fulfilling entrepreneurial journey and had the opportunity to come to the United States to pursue

her interests for VC investing. This is what she hopes students will take into consideration before locking onto a specific dream or goal.

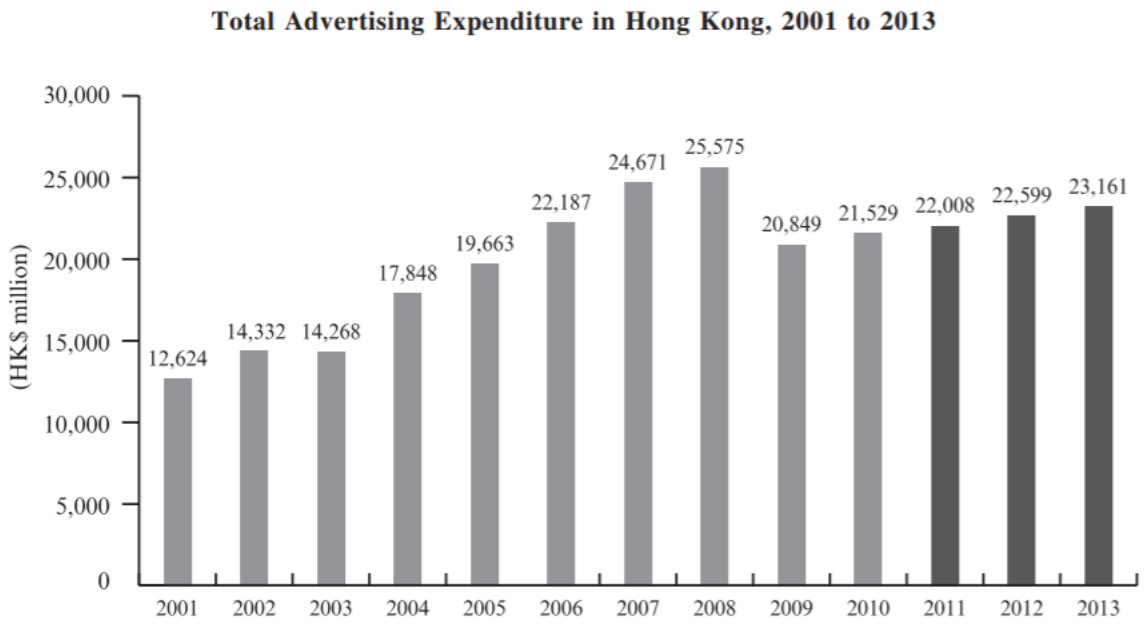
Additionally, she believes that all young entrepreneurs should immerse themselves into learning as much as they can in a wide range of fields, even after they graduate from college. Wang hopes that "whenever people say something is definitely not possible", students will utilize their inquisitive mindsets to "think thrice, challenge traditional ideas, and innovate."

Exhibit 1 Gross Added Value of Hong Kong Advertising Industry, 1997-2007



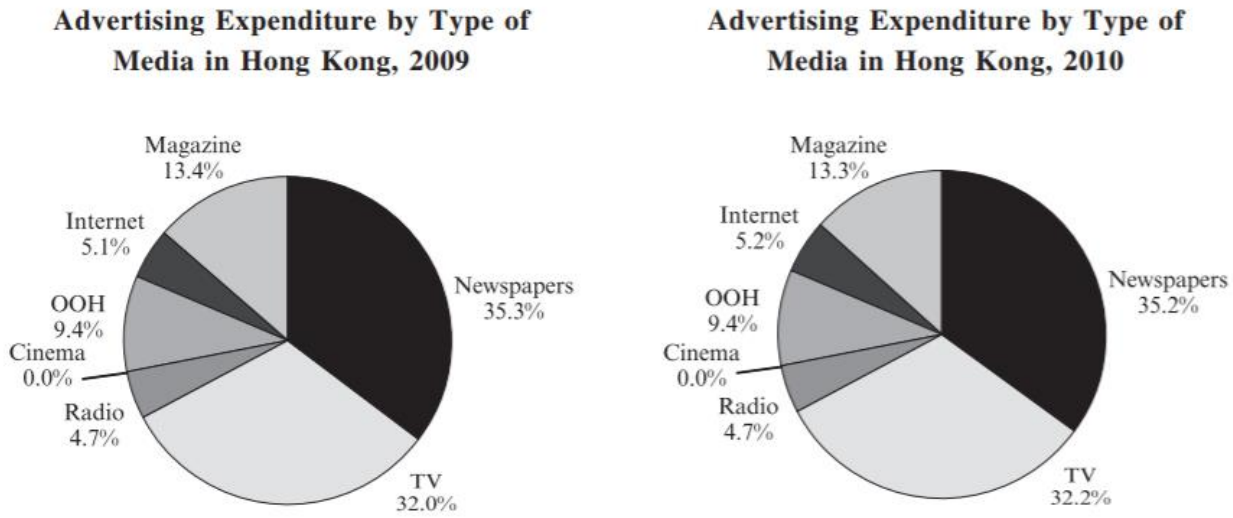
Source "Current Status of the Various Sectors of Creative Industries in Hong Kong", Page 110, accessed November 2017
http://www.ideascentre.hk/wordpress/wp-content/uploads/2009/04/ci_report_part2.pdf

Exhibit 2 Total advertising expenditures in Hong Kong, 2001-2013



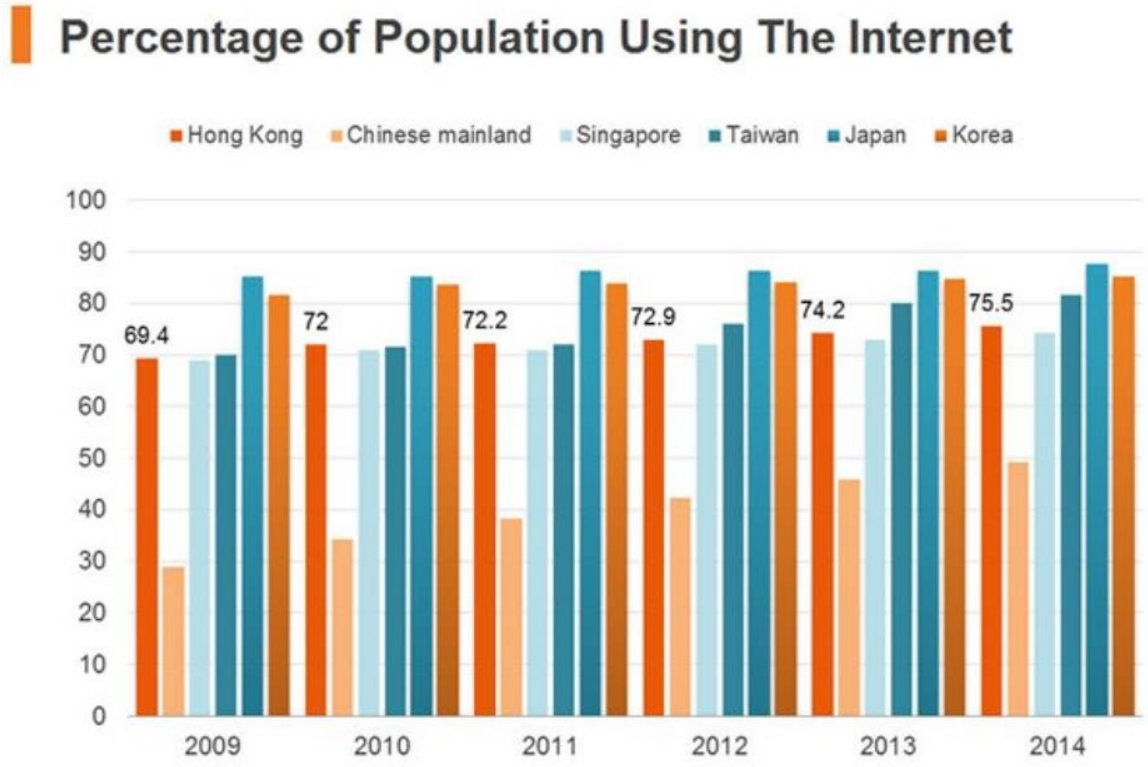
Source Industry Overview Report, page 51, accessed November 2017 http://www.hkexnews.hk/listedco/listconews/gem/2011/0630/08112_1106725/E114.pdf

Exhibit 3 Advertising Expenditure Breakdown in Hong Kong, 2009 & 2010



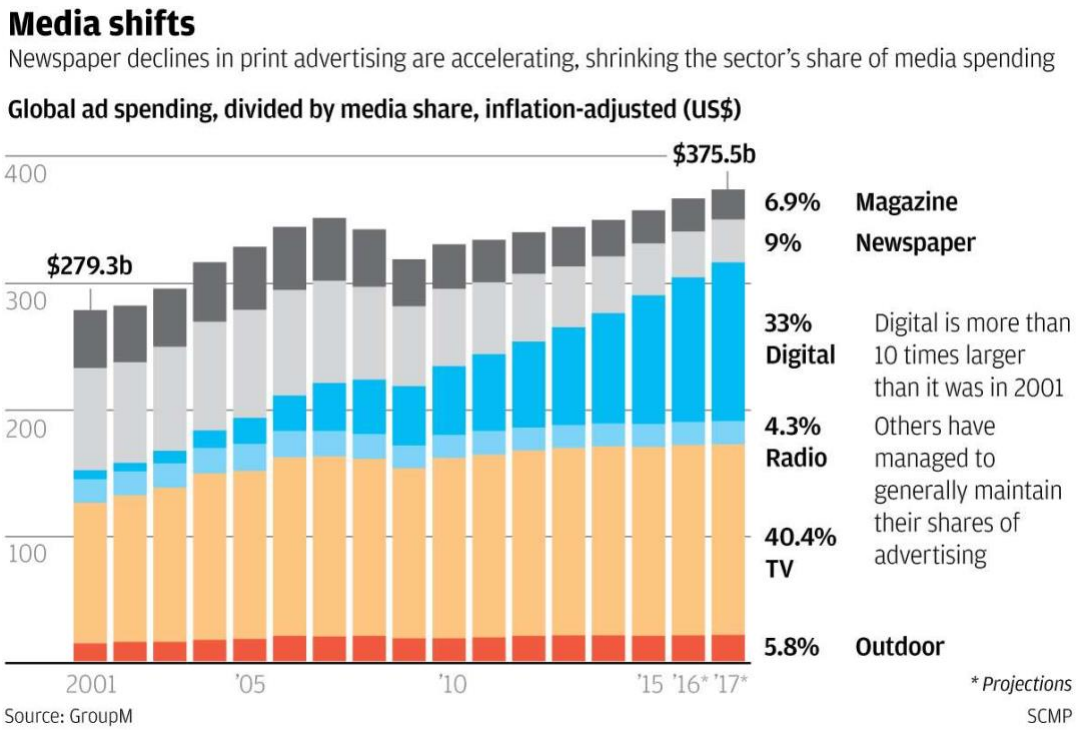
Source Industry Overview Report, page 52, accessed November 2017 http://www.hkexnews.hk/listedco/listconews/gem/2011/0630/08112_1106725/E114.pdf

Exhibit 4 More Hong Kong Citizens Using the Internet, 2009-2014



Source "Hong Kong's Advertising Industry: Digital Evolution", June 16, 2015, Hong Kong Trade Development Council, accessed November 2017 http://hkmb.hktdc.com/en/1X0A2R8J/hktdc-research/Hong-Kong's-Advertising-Industry-Digital-Evolution

Exhibit 5 Media Shifts in the Advertising Industries Globally, 2001-2017



Source "Facebook, Google, SCMP band together to spur Hong Kong's growth in digital advertising", October 26, 2016, South China Morning Post, accessed November 2017
http://www.scmp.com/tech/leaders-founders/article/2040334/facebook-google-scmp-band-together-spur-hong-kongs-growth

Berkeley Leadership Case Series

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Ricardo San Martin: An International Entrepreneur

It's exactly like climate change... If I don't see the water level rising to this level, I don't see the connection. We see the connection between the cow suffering and the meat. The meat companies don't advertise a picture of the animal. The meat has been objectified. Very few people have that sensibility. I have a son, a vegan, and he sees that suffering and that story. But 95% of the people don't see that, and so we keep on eating meat. So, how do we shift people away from eating meat that is mega-cheap? It's a very complex issue and I don't have an answer. I hope the students one day will.

— Ricardo San Martin

The students in Ricardo San Martin's Plant-Based Meat challenge lab class argue about the vast obstacles that stand ahead of them. They are attempting to develop new plant-based meat alternatives that will succeed in a finicky market.

San Martin teaches the Challenge Lab in Berkeley Engineering's Sutardja Center of Entrepreneurship & Technology. The class is a unique intersection of both cutting-edge food-tech and entrepreneurship. Prior to arriving in Berkeley as a Professor, San Martin invented a plant-based extract derivative that makes the foam in root beer and other beverages. The firm he started with his invention is now a multi-million-dollar company with customers such as Coca-Cola and PepsiCo. His PhD might make him an unsuspecting startup founder in the food industry, but his background in research struck a chord with his desire to innovate.

Childhood Values

San Martin was born in 1956, in Santiago, Chile. He grew up between La Serena, a little beach city in the northern Chile, and Santiago, the capital. His father, a Basque descendant, was a very respected lawyer in Chile. He was handpicked by the President of Chile as a notary in Santiago, an important position shared by few lawyers in the country. He defined himself as a "tennis player that was lucky enough to practice law." Whether in tennis or law, San Martin describes his

This case was prepared in the Sutardja Center for Entrepreneurship & Technology by Lecturer Stephen Torres, editors Mudit Goyal and Thomas Ferry, and case researchers Ishan Sharma, Manar Safi, Pablo Correa, Pouriya Bagheri and Rhett Gentile. It was reviewed and approved prior to publication by a company designate. Funding for the development of this case was provided by the University of California, Berkeley and not by the company. Berkeley Engineering cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

father as someone who "always worked harder than any man I've seen." His mother completed two years of a social work degree and was extremely smart and intellectually curious. "She never stopped learning," San Martin said of his mother, "whether crossword puzzles or her piles of books, she always emphasized the importance of an education."

One of the most strident lessons San Martin learned from his father was on the value of obligation and responsibility. Even from a young age, San Martin was introduced to the importance of accountability. In particular, his father always told him "Never ever get yourself into debt... being in debt was just about the worst thing you could do." At the time, he had no idea how important these teachings would become over the course of his career.

Political complications and unrest in Chile forced a difficult decision on San Martin's father: he could take his family to Spain to guarantee their safety, or he could remain in Chile, where his job would provide a very comfortable lifestyle but daily life was filled with political unrest of the time. He decided that safety was paramount, and he moved the family to Madrid. Although the family was forced to leave behind a lot of money, the decision was never questioned; they understood it had been the right choice: "[The money] was never mentioned in the house. It wasn't even a thing," San Martin remembers.

Starting his new life in Madrid, San Martin had to finish his high school education in an American School. The experience was an incredible change. San Martin was able to choose his classes and electives, and carve out a personalized curriculum of subjects that interested him most. Chilean education had been extremely rigid, and this new found freedom sparked a lifelong passion for self-directed learning. Reflecting on his early education, San Martin says:

> "My grades were fine before, but after that, I would spend the summers teaching myself trigonometry, reading more and more… That school, in that time of my life, changed my intellectual curiosity. For the first time, I considered engineering or a PhD as a career opportunity, when people around me never did."

Self-directed learning would prove the key to his future success as both an academic and an entrepreneur. Opportunities arose to develop niche knowledge of both science and business that lent him an edge in later pursuits.

Pursuing Higher Education

San Martin's curiosity and drive to keep learning about the things that fascinated him lead him back to Chile, where he attended Pontificia Universidad Católica (PUC) and received his Chemical Engineering degree in 1981. He then was awarded a Fulbright Scholarship and attended the University of California, Berkeley, where he earned a Master's Degree in Chemical Engineering. The difference between the two universities was striking; many of the textbooks he used in Chile were written by the professors he studied with at Berkeley.

His father tried to convince him to use his Master's degree to start a lucrative career in industry in the United States. However, San Martin was not finished with academia and wanted more knowledge. He pursued a PhD in Biotechnology at the Imperial College in London, sponsored by the British Council in Chile. While he had thrived in the intense environment of Berkeley and loved being surrounded by such great minds, he had felt that a Master's degree was too structured; "I knew that if I did this and this, I would receive my degree. In London I was given a problem and had to make the best of it. No one held me accountable for my progress or lack of it. This unstructured education added perfectly to the structured background I came from."

The freedom and resources afforded San Martin in London allowed him to develop the passion that would later define his Biotechnology career. "I was really interested in plants, trees, and fish, more bio kind of things. It wasn't about the business, but the topic." After publishing his thesis and earning his PhD, San Martin decided it was time to go back to Chile. "I always felt a debt towards my country. Even though there was no financial or contractual obligation with them, I felt a strong responsibility for giving back to where I came from."

Back in Chile, he started his career as a professor, teaching Thermodynamics. He also started analyzing different research topics that could be developed into a business. "My goal was not only to teach chemical engineering, but to develop an applied research laboratory dedicated to plant extracts and biotechnology, that could lead to novel ventures in Chile."

San Martin's first big break was a project of interest and luck. While working on a project focusing on botanical extracts, he came across an article in a United Nations magazine about the extracts of a unique Chilean tree, Quillaja saponaria (or quillay) that showed promising applications in experimental AIDS vaccines.

While researching all the possible uses cases for the plant, San Martin developed an alternative application. In the US, the plant was approved for human consumption by the FDA. Companies such as PepsiCo and Coca Cola used it as foaming agents in root-beer and slush-type drinks. However, the entire processing of the tree was done internationally, with Chile was the only source of raw tree production. This had a series of drawbacks, especially in economic and ecological terms.

> "When I started my research, Quillaja extracts were not produced in Chile, only the tree. Instead, bark from old Quillaja trees was exported to the US, Europe and Japan to be refined into the extract. The ecological damage was immense and very few old trees remained in the Central part of Chile, where growing conditions are optimal. The economic benefits for Chile were minimal, since a law was in place to promote non-traditional exports, such as Quillaja bark, and 10% of the export value was reintegrated to the exporter.
>
> This exploitation process lacked scalability, since debarking was limited to 4 months. Every year 60,000 wild trees were felled, and this was the maximum allowed by Chilean forestry authorities. Overall supply was of only 250-300 tons per year of concentrated liquid extract. More promising applications, like food emulsifier or biopesticides, were stifled because the bark that Chile exported each year was insufficient."

San Martin realized that there was a business opportunity for someone with his unique credentials and knowledge. If he could scientifically find a cheaper way to refine the tree in Chile, he could help Chile commercialize the tree more efficiently. Thinking back on the magazine that lead him to this realization, San Martin says, "I was really lucky coming across this magazine. I saw this as a way to make myself a little side income, maybe 1,000 USD per month, by simply doing some research."

From Academia to Entrepreneurship

San Martin believed he could develop an edible foam derived from quillay that could mimic or enhance the froth of root beer and soda. Quillaja extract-based foaming agents would

significantly extend the shelf life of sodas and enhance the drinking experience, which would prove extremely valuable to big-name soda brands.

San Martin began his quest to find an alternative and sustainable method to produce these extracts. His goal was to increase yield of extract from each tree, while also making the extract flexible enough to be used for different applications. He could be found on the fields of Chile examining rotting quillay trees that were debarked from exploitation. He found that by harvesting the total biomass of the tree, not just the bark which was traditionally done, he could significantly increase harvest rates. His new method reduced the number of trees exploited each year from 60,000 to 10,000.

It took two years of intense research to produce commercial extracts from the quillay trees that were comparable to the ones derived from bark. In a breakthrough, San Martin was able to harvest these extracts and store them as liquid concentrates or spray-dried powders. This contributed immensely to commercialization. As San Martin notes about his process, "[The new process] opened immense opportunities, since the raw material could be sourced year-round from whole trees or from the pruning of existing bush-type trees that regenerate after the exploitation of bark[1]." The new methods developed By San Martin also increased the exposure of the plants to the research community, increasing substantially the number of products based on its extracts[2].

The dean of The Pontificia Universidad Católica, having observed San Martin's work, saw the potential for significant return on investment for the university. Even though San Martin's father had offered to fund his son's work out of his own pocket, the dean intervened and offered San Martin lab space free-of-charge as part of a "partnership" with the university. With nothing more than an informal handshake, San Martin began his work.

After a few months of work, San Martin started getting results greater than his original expectations. While he had just developed the first prototype of his quillay foam, the university grew restless for a return on their investment and decided to turn his no-strings attached grant into a loan with a fast approaching maturity date.

San Martin's worry-free professorship now was hanging in the balance, and he felt that he was being painted as a villainous professor callously ignoring his debt obligation to the university. His father's words warning against the perils of debt were also ringing in his head. As an academic with no other sources of income, San Martin's stress levels shot up. With his back against the wall, he felt he had to monetize his project. He decided to transition his university research project into the uncertain world of start-ups.

The speed of his project accelerated immensely, innovation driven by the fear of debt and his cash burn rate. "This wasn't research, this was real stuff now," San Martin recalls about his company, "There was a new sense of urgency. I only had about 2-3 months of cash to sustain myself."

San Martin was brilliant at solving technical problems. However, his obsession with research and problem-solving blinded him to the importance of sales, distribution channels, and marketing. "I thought once I had the product, people would run to buy it. I was wrong. No one knew I existed." With his professorship on the line and debt growing, he was in desperate need of a solution to his customer acquisition problem.

[1] See Exhibit 1
[2] See Exhibit 2 for number of scientific publications on Quillaja saponins since 1998.

Natural Response: Initial Roots

The first instinct San Martin had was to find a co-founder. He needed to find someone to run marketing, supply chain, and finance while he focused on research and product development. Using his university contacts, friends, and family, he narrowed down his search to 50 potential candidates. San Martin sent "cold faxes" to each candidate and received exactly one response. One of the last candidates, Paul Hiley, turned out to be exactly what San Martin needed. Hiley was based in San Diego. He had connections with Coca Cola, Pepsi, and other brand name consumer beverage companies. Hiley already had a company, Desert King, working with similar extracts. He also had the distribution channels San Martin needed. Paul signed on to help.

Hiley and San Martin had met via fax from thousands of miles away, but their exchanges warmed as they found commonalities. "Entrepreneurs will tell you that their success came from their good decisions, but that is not really how it is. It's a lot about luck. Engineers don't like to talk about luck, because it can't be controlled. But ask anyone to be honest, and it's all about luck. It was luck that Paul decided to respond to my fax, and it was luck that his wife was from Mexico, and so we shared a cultural understanding." They found organizational synergies too: complementing skillsets with San Martin's research background, and Paul's operational background. After extensive pilot plant testing, in 1995, together with PUC, San Martin and Paul founded their company in Chile, Natural Response, to produce quillay extracts[3].

Sprouting the Company

By 1996, Natural Response was beginning to gain traction and grow. San Martin had been finalizing his product, and Paul established a partnership with Desert King International. Desert King produced a similar product and had the distribution channels to sell Natural Response's products.

It wasn't long before Hiley approached San Martin with a client order: one container of the product – a massive amount compared to what San Martin was used to producing. San Martin recounts about the order, "At this time, the most I had made was 1 liter… but they wanted a container? What was a container? Was it this high", as he gestured towards his knee-level, "or this big?", spreading his arms out.

Without the funds to produce more, San Martin told Hiley that they would not be able to fulfill the order without some type of investment. So Hiley personally invested. "I had no credit… There was a lot of trust, but my degree from Berkeley helped. [It showed] that someone had approved me", remembers San Martin. "There was really a theme of co-dependency on each other. We could not have succeeded without the other."

When San Martin expressed his doubt about being able to produce and sell so much product, Hiley reassured him, "Give it six months, and I will arrange the rest." San Martin trusted his partner. He knew that Hiley had been faced with operational, strategic nightmares in the past and had mustered through them. Now, it was San Martin's responsibility to deliver on his part.

[3] See Exhibit 3

To keep up with production needs, a small production facility was built near the Chilean city of Valparaiso. Within six months, Natural Response was exporting the extracts to Coca-Cola and Pepsi. The beverage companies immediately adopted the extracts due to environmental benefits. In Chile, the exploitation of bark dropped dramatically, and today it is 10% of what it was 20 years ago.

By September, 1996, Natural Response had built a plant in Valparaíso, Chile, capable of producing 5 tons of product per month.

Company Turmoil

Personal turmoil in San Martin's life soon leaked into his involvement in the company. San Martin went through a divorce from his wife. When San Martin first filled out the paperwork for Natural Response, Universidad Católica required that San Martin have someone co-sign on all of the papers to share liability. Since he hadn't even begun a search for a business partner at the time, San Martin decided to sign with his wife. He placed her on the board of the company and split the ownership with her 50/50. Until their divorce, "she had never had any interest in the company or its decisions, whether it went one way or another. But after we divorced, she thought her 50% was worth some money, and so she suddenly had an interest in its decisions, even though she knew little to nothing about it," according to San Martin.

San Martin's ex-wife's involvement on the board led to conflict and fights about the status of the company, which began to affect their relationship with their children and take a toll on San Martin's mental health. "At one point, I got fed up and said, 'this is not the company I want to run." San Martin approached Hiley for help. "I was tired, being a professor 100% of the time, with this company and family problems on top of that. So, I asked him, why don't you buy me out? He didn't want to, but he did…"

San Martin left Natural Response after working with Paul for 10 years, building sales to over $6 million, and more than quadrupling total Chilean quillay exports. After San Martin's departure, the company continued to grow, increasing more than 400%. The five product lines that San Martin helped develop continue to sell millions of dollars per year. San Martin recognizes that, in leaving his own creation, he "left a lot of money on the table... but I don't regret a thing." The most important thing to him was that the burden of debt had been lifted. Although he'd lost out on significant gains, he finally had the freedom to do whatever he wanted, without the obligations of debt or research.

> "From the very beginning, I have always said I was not after money. What drove me was that I wanted to create something meaningful and fun for me to do. It was not so that I could make it, sell it, have an exit, and be rich." That attitude had served San Martin as a vice and a virtue. "Because of that," he recounts, "I undervalued to my partners what I brought to the table to be the same as others who did not bring much".

When asked why he didn't regret pulling out early of the company he created, San Martin elaborates, "That was the information I had at that moment in time, that was the life I was facing--I never looked back. These decisions were not a rational process at all… it is really like surfing… You cannot explain why you are doing the things you are doing… You don't have an algorithm to make such a decision...".

After exiting Natural Response, San Martin decided to take his lessons and start another company with Hiley. This time, San martin did not want to be involved at all in the production

process. He gravitated towards what he loved the most about starting a company--researching and inventing. Hiley and San Martin ended up starting yet another successful company. The company was again plant-based and had strong growth. With two successful companies under his belt, San Martin set his sights at the Silicon Valley. He decided to take a sabbatical year at Stanford University, where he began getting exposure to Silicon Valley culture.

From the Chilean Mountains to the Silicon Valley

San Martin absorbed the contrasting life of Silicon Valley with joy. He loved his peers' willingness to take risk, make products to help the world, and innovate. It was also a good environment for his family and children. San Martin's scholarship only lasted a year before his visa expired. The time came for he and his family to decide on whether to apply for an extension or move back to Chile. He decided to stay, despite having financial stability in Chile. The risk of going into bankruptcy after staying for 2-3 years, or even not getting a visa extension, haunted him. But the lure of Silicon Valley's entrepreneurial landscape and schooling made him determined to stay. In the same way his father had made a difficult choice several years ago, San Martin knew it was time to do the same.

San Martin visited Chile to resign from his position as a professor at PUC so he could stay in the Silicon Valley. However, the Dean of the Engineering School saw potential in the connection that San Martin had created with the Silicon Valley. He saw San Martin's travel as an opportunity to expose students to a unique ecosystem. The Dean asked him to spearhead a new bridge program, an exchange between PUC and Silicon Valley, which San Martin agreed to.

San Martin visited Berkeley as a visiting scholar and caught the eye of Ikhlaq Sidhu and Ken Singer, who run Berkeley Engineering's Sutardja Center for Entrepreneurship and Technology (SCET). San Martin's character as a learner and innovator impressed Singer; recounting his first meetings with San Martin, he says:

> "I knew he had been charged by his Dean at the time to explore new relationships and new kinds of educational models that he might be able to take back [to PUC], and he met with us and we hit it off... and even though he was based in Stanford he kept coming back to meet with us to talk more about what we were doing. Over that time, we invited him to come over and do more work with us and spend more time with our students and projects and programs, and he decided to jump ship."

Soon after, Singer would invite San Martin to teach his own Challenge Lam class at Berkeley. When inviting San Martin to Berkeley, Singer knew the remarkable asset he was bringing to the students of SCET. "The kind of relationships he develops with his colleagues and his students is rare. His authenticity and the charisma he has with his students is really what makes him such an asset to any university. I think the students here are quite lucky." In particular, Singer saw in San Martin a familiar characteristic; that of the natural entrepreneur. As a serial entrepreneur himself, Singer recognized that San Martin thrived on the chaos and freedom of creating things from scratch, creating companies and industries from whole cloth. As Singer commented:

> "My background is to teach entrepreneurship and I've been an entrepreneur myself for many cycles… and with that kind of experience, you get to see some patterns. One of the patterns is you see the types of people that are in entrepreneurship, starting their own companies in the innovation space, and Ricardo is of that group of—and I hate to use this term—a natural."

Singer continued to describe qualities that he immediately noticed about San Martin, such as his comfort with the uncertainty in entrepreneurship. "Ricardo is drawn to the chaos and uncertainty of creating a company. Regardless of the educational or family background, he is drawn to it, while other people run from that level of chaos."

Perhaps one of the most notable aspects that Singer mentioned was San Martin's success in entrepreneurship, despite his accomplished background in academia. He noted many researchers are discouraged from commercializing their research, but San Martin had the ability to leverage and harness his research into something of value." Continuing, Singer states:

> "Another characteristic of Ricardo, which is something that you do see as a common thread in every entrepreneur that I know that has been successful, is his level of curiosity. He's incredibly curious about everything. He acts on that curiosity. It's not just asking the right questions and saying, 'Hmm this is an area that needs to be explored or there's an open question here', but he takes it to the next level and tries to answer those questions, and those questions can range: it's not just 'hey is there an answer to this weird technical problem, or weird anomaly that we've seen in our research'…Rather, it's 'can I leverage this into something that can be commercialized and harness it into something of value'. And all effective entrepreneurs seem to do that naturally."

The staff at SCET regularly monitor the startup environment for interesting and innovative emerging technologies, and "meatless meat" was a rapidly evolving new opportunity. Professor Ikhlaq Sidhu suggested the teaching topic to San Martin for a Challenge Lab, as it seemed to be right up his alley of biotechnology and repurposing natural resources. Although San Martin had no prior experience in the field, San Martin accepted the role and the topic. The field was so new, San Martin saw an opportunity to become one of the world's leading experts in the subject. This risk would soon pay dividends as new opportunities emerged from the fertile ground of the Challenge Lab.

Challenge Lab: Plant Based Meat

San Martin's plant-based meat class was met with great enthusiasm from students[4]. San Martin attributes the popularity due to changing perceptions of meat consumption and veganism in the Bay Area. San Martin says:

> "4-5% of people are vegan, and that hasn't changed in the past 50 years. But these days, there is more hype about vegetarian options, especially in developed areas like the Silicon Valley. The main challenge is customer perception--I hope the idea can expand to other areas of the world. With plant-based meats, would come sustainability and affordability that not relying on meats bring. Overall, the theme is complex because food has meaning and it has a cultural heritage. It is not like building an iPhone."

Meat is an unusually difficult product to innovate, much more so than other technological products. Meat, and food in general, is intensely personal. People have very acute sense of taste

[4] See Exhibit 4.

and texture. Gathering data and feedback can be very difficult. While a market exists in the Bay Area, as demonstrated by early successes of products like the Impossible Burger, more conservative areas such as Ohio and Michigan are much slower on the uptake. There is less of an early-adopter culture, especially for something as traditional as meat.

The Challenge Lab aims to create new plant-based meat products and bring them to market. As a student from the course says, "[Ricardo] does focus not only on the research part, but on the entrepreneurial aspect of this challenge as well. It's not only about developing or designing a product based on plants, but also finding a good market fit for this product." Within the class, San Martin tries to create an environment of high growth and learning.

The key question for meatless meat is a familiar one: How do you design for beyond Silicon Valley? There is not a well-defined answer, but it's attracted students, professors, and onlookers alike. Says Teibel Education Consulting on a feature about San Martin's class[5]:

> "Professor San Martin's own transformation comes at the forefront of the science he teaches. The cutting-edge chemistry, biology, business, and manufacturing that goes on in the course serves to put student and teacher alike in the role of explorer, and it's changed the way San Martin approaches the classroom."

The Future

Just as he did in his early university days, San Martin is balancing his professorship with building a company. Currently, he is researching ways to harvest the quillay trees with greater efficiency. When San Martin first made a breakthrough in the 1990s after finding the quillay plant could be used as a foam agent in sodas, he helped create an industry for the Chilean economy. However, since then, he has been saddened by the mass exploitation of the crop and has dedicated his time to finding out how to harvest more extract from the same amount of plant. With a steadfast wonder in his eyes, San Martin explained his progress:

> "When I first started, it took 6 quillay trees to make one unit of the extract. Through my research over the years, I got that ratio to 1 quillay tree to 1 unit of extract. Locking myself in a room these past months over the weekends, I've been able to get that number down to 0.6. I think I'm getting close to reaching 0.5 plants per unit of extract, the lower bound."

After years in research and entrepreneurship, San Martin also hopes to spend more time giving back. He hopes to expand the Bridge program at PUC that once brought him to the Silicon Valley. He would also like to help bring more companies from Chile to Silicon Valley abd expose them to new technologies and alliances that foster innovation. His course in Coursera, Decoding Silicon Valley, is often referred as one of the top resources for understanding Silicon Valley's culture[6].

San Martin recognizes research as an integral part of his life, but reflecting back, he recognizes how it both complemented and went against his pursuits in entrepreneurship. In both capacities, he was motivated by the results of being able to build something and make the world a better place. However, entrepreneurship also has some stark contrasts with research. San Martin mentions that in entrepreneurship there is no formulaic plan you can follow.

[5] See Exhibit 5.
[6] See Exhibit 6.

“Success is weird. What would have happened, if for example, Paul never answered my fax? Or I hadn’t met Ikhlaq Sidhu?”, San Martin says, “Sometime, a story just comes down to dumb luck.”

Exhibit 1 San Martin's Paper on Uses of Quillaja

INDUSTRIAL USES AND SUSTAINABLE SUPPLY OF *QUILLAJA SAPONARIA* (ROSACEAE) SAPONINS[1]

RICARDO SAN MARTÍN AND REINALDO BRIONES

San Martín, R., and R. Briones. *(Department of Chemical and Bioprocess Engineering, Catholic University, Av. Vicuña Mackenna 4860, Santiago—Chile).* INDUSTRIAL USES AND SUSTAINABLE SUPPLY OF *QUILLAJA SAPONARIA* (ROSACEAE) SAPONINS. *Economic Botany 53(3):302–311, 1999.* *The bark of the tree* Quillaja saponaria, *indigenous to Chile, is one of the major sources of industrially used triterpenoid saponins. For decades quillaja extracts have been used as foaming agents in beverages, emulsifiers in foods, wetting agent in photography, etc. Overexploitation of the bark has caused important ecological damage and a shortage of this resource. However, this can still be remedied by using whole quillaja wood (and not just the bark), for the production of saponins. This raw material can be obtained in large quantities from pruning operations, reducing the need to fell trees. This review covers ecological aspects of quillaja exploitation, as well as a discussion of its novel industrial applications.*

USOS INDUSTRIALES Y ABASTECIMIENTO SUSTENABLE DE SAPONINA DE *QUILLAJA SAPONARIA. La corteza del árbol* Quillaja saponaria, *originario de Chile, es una de las principales fuentes industriales de saponinas triterpénicas. Durante décadas los extractos de quillay han sido usados como espumante en bebidas, emulsificante en alimentos, agente humectante en fotografía, etc. La sobre explotación de la corteza ha causado un importante daño ecológico y escasez de este recurso. Esto aún puede ser remediado usando en forma integral toda la biomasa del árbol y no sólo la corteza. Esta materia prima es abundante, y se obtiene del raleo de los bosques existentes, sin necesidad de cortar árboles. Este trabajo cubre aspectos ecológicos de la explotación del quillay, y novedosos usos industriales de sus saponinas.*

Key Words: *Quillaja saponaria*; saponins; sustainable production.

Exhibit 2 Increase in Scientific Publications on Quillaja Saponins

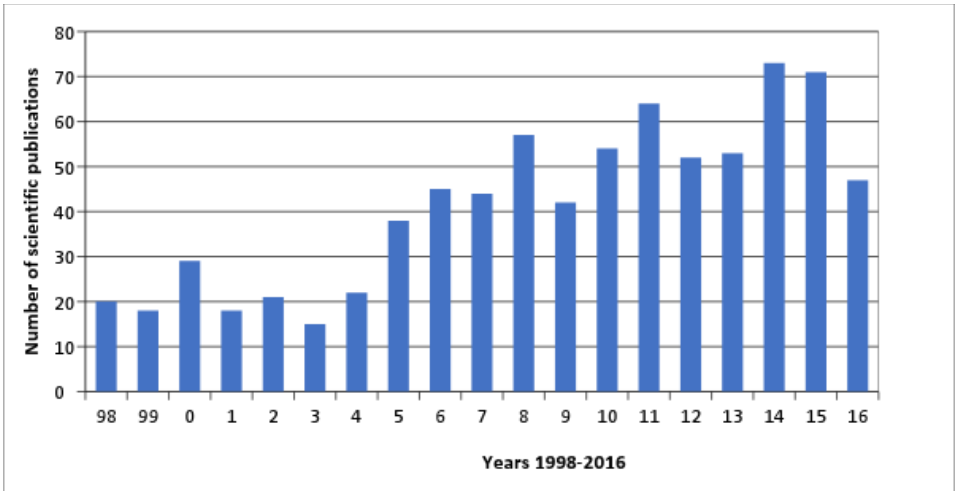


Exhibit 3 Natural Response, San Martin's first company

NATURAL RESPONSE
High Technology Plants Extracts

Search this site

HOME WHO ARE WE PRODUCTS QUALITY CONTACT

VISION AND MISSION

Quality, Food Safety, Occupational Health and Safety Politics.

- To ensure the continous improvement of our management, quality, food safety, occupational health and safety system efficency. Also, to ensure the compliance with the clients requirements, legal and intern.
- To ensure every worker to incorporate the concepts of quality, food safety, safety, occupational health and safety, continous improvement and efficiency in the performance of their tasks, so quality and safe products may be delivered which compliance the national and international standards, satisfying the needs and expectatives of our clients.
- To promote long time relationships with our providers and to support the commercial tasks of Desert King Chile in keeping long time relationships with the final clients, keeping an intern and extern effective communication before any change that may affect the quality and food safety characteristics of our products.
- To do our productive activities with utmost respect for the enviroment and existing legal regulations in Chile, with an special concern in natural resources exploitation sustentability used as raw materials.
- Through Research and Development, to keep leadership in quality and innovation of our processes, products and their applications.

Vladimir Aránguiz

Gerente de Planta

Natural Response S.A.

Vision

To develop products, productive processes and supply chains of natural extracts, rich in saponins, to design from them and in association with Desert King Chile S.A, innovative solutions of applications for our clients, guarding the quality, food safety, occupational health and safety and managing for a a continous improvement in the field of the applications.

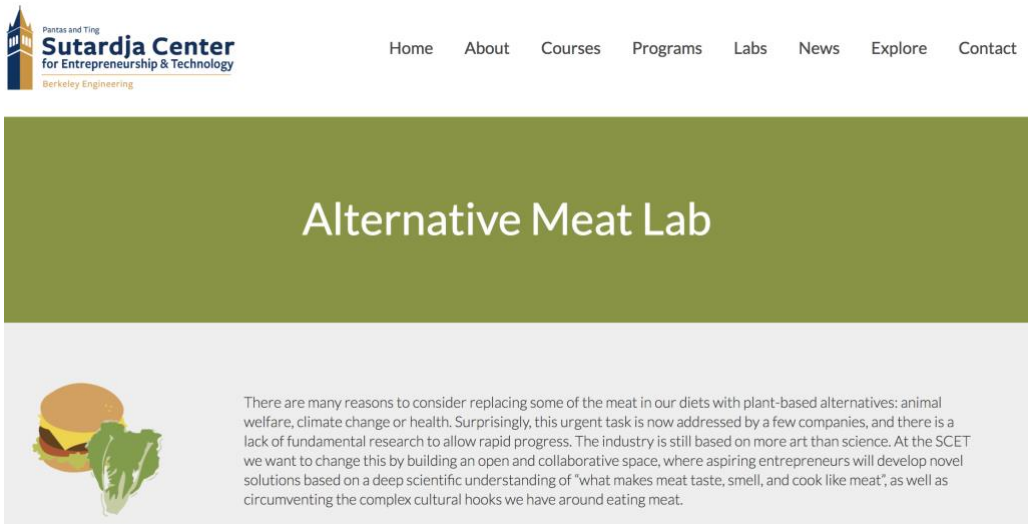
Mission

- To develop products from natural extracts with abundant active principles.
- To stablish a supply chain for them.
- To understand the needs of our clients and to satisfy them with innovative solutions.
- To monitor and continously improve the solutions we give to our clients, using defined objectives and meassures.
- To develop cutting-edge knowledge to differenciate us and expand our products and services.

Who We Are

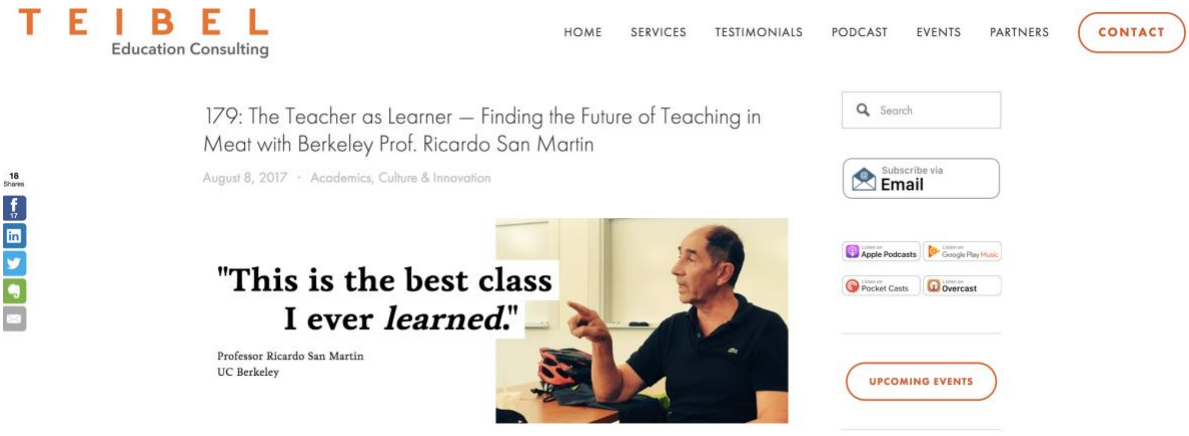
Our Company
Our Team
Vision and Mission
The Quillaja

Exhibit 4 Plant Based Meat Challenge Lab



Source: http://scet.berkeley.edu/alternative-meat-lab/

Exhibit 5 Interview with TEIBEL



Source: https://teibelinc.com/podcast/179

Exhibit 6 San Martin's Course about Silicon Valley: Decodificando Silicon Valley (Decoding Silicon Valley)

source: https://www.coursera.org/learn/decodificando-silicon-valley

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Berkeley Leadership Case Series

Berkeley ENGINEERING

20-180-009

November 28, 2017

David J. Kim: A Lifelong Leader

"Entrepreneurship is a lifestyle, not an interest. I am always asking myself, 'What problem do I want to solve next?'"

- David J. Kim

Early Defining Moments

Kim is the youngest of three children born to Korean immigrants in the United States. Though highly educated, his parents were not very proficient in English. This language barrier forced Kim's parents to be entrepreneurial, starting and working at several small businesses in their neighborhood. As a result, Kim and his two sisters rarely got to spend time with their parents. His parents were always out of the home and working on one business or another. While this lifestyle was hard on him as a young child, this experience became a defining moment in Kim's life. He noticed early on how hard his parents worked and how many sacrifices they made to provide for their children.

Kim explains that the seeds of entrepreneurship were planted in him very early on, and his parents' entrepreneurial approach towards life played a significant role in the birth of his own zeal. He recollects that watching his parents work made him realize that "the world creates opportunities for all folks. There is a wealth of opportunities you can pursue. Ultimately, [the opportunity] is as big as you make it."

Being able to understand what his parents had done for him and his two sisters became a pivotal point in his life. Kim had the desire to do something that would make his parents proud, and entrepreneurship appeared to be the best way to give back to the people who had given him so much.

With the inspiration from his childhood as a foundation, Kim began his journey several years later, at the University of California, Berkeley.

University Education and Early Career

Kim received his undergraduate degree in Industrial Engineering and Operations Research (IEOR) from Berkeley. It was through his curriculum that he learned the technical and the soft skills needed to be a successful leader. It was also here that he met another valuable mentor, Professor Candace Yano, who encouraged Kim to think big and shoot for the stars. As Kim continued to expand his network at Berkeley, he met people who would eventually become his co-workers and co-founders in future ventures.

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It was also at Berkeley that Kim launched his first startup: a women's fashion company called Francis & Company. Through Francis & Company, Kim and his cofounder strived to offer a lower-cost alternative clothing line to high-end, brand-name clothing. Kim, who was 20 years old at the time, was responsible for the supply chain and business operations of the company. Francis & Company was based in Los Angeles, and Kim went back and forth between Berkeley and Southern California on a weekly basis to balance his startup with schoolwork. Today, he admits that this was one of the factors that led him to leave the company: despite the rewards of running a business, the experience in school was invaluable. While Francis & Company failed in the long run, Kim describes it as "arguably the most valuable life experience I have had."

It was through the founding and ultimate failure of this business that Kim realized the difference between dealing with problems in a controlled, academic environment and the real world. Outside of the classroom, much more was at stake. Risks were higher, and decisions had very real consequences which often impacted the entire company. The experience of Francis & Company also allowed Kim to develop a number of new relationships with both experienced industry workers and executive managers. These relationships would come to be invaluable when he worked on his future startups eCandy and Intellus Learning.

Perhaps Kim's most important takeaway from Francis & Company, however, was the realization that there are several business functions that he was not equipped to handle at the time. Kim realized he lacked a holistic understanding of how to run a company on the business end. If Kim were to venture into entrepreneurship in the future, he understood that he needed a strong foundation in business fundamentals. As a result, Kim pursued investment banking at BancAmerica Robertson Stephens for 2.5 years and consulting at Accenture for 1 year after graduating from Berkeley. These experiences were short but invaluable, because there Kim developed a strong foundation in financial literacy as well as strategic decision making, which positioned him well for the future.

While the failure of Francis & Company served as a wakeup call in many ways, there were also several positive takeaways from the experience. He realized that a substantial failure such as this one is a self-defining experience, and it allowed for more self-reflection and self-awareness for the challenges to come. Most importantly, it took this failure for Kim to understand that "entrepreneurship is not an interest, it is a way of life."

eCandy: Entrepreneurial Beginnings

Following a foray into the corporate sector, Kim realized that neither investment banking or consulting provided the exact career fit that he desired. Looking back, Kim recognized that "entrepreneurs don't fit anywhere; [they're] an oddball," and these two experiences made him realize how much he wanted to be at the heart of a company rather than simply an analyst of the system.

Soon enough, Kim found himself involved in a startup project called eCandy, an online confectionary marketplace.

The idea for eCandy came to Kim and John Hadl, one of Kim's high school friends, over dinner in Los Angeles. During this conversation, both Kim and Hadl became cognizant of the fact that eating candy is an experience that often gets tied to an individual's memories and upbringing, making it a high-impact, emotional consumption product. However, some candies are only available within specific geographical regions, making them inaccessible to many consumers who grew up with them. They had found a pain point. Kim and Hadl then arrived at a defining question to address it: why not make regional candies more accessible to a national consumer base?

Kim and Hadl had many pivots in their quest to address this business opportunity. Originally they started with a more retailer-manufacturer focus by partnering with the largest candy

association and second largest distributer. However, retailers were not informed of the demand for the candy. After starting the venture Kim realized that "you never understand a market until you're actually in it." Kim and Hadl were able to grow eCandy to become the one-stop-shop for those looking for a variety of candy distributors. Once eCandy had grown to a substantial size, Kim decided to sell the company because while it had started with three co-founders, it eventually became just him working the entire operation. To take the company to the next level would have been risky, and he wanted to make a decision that would be best for the stakeholders and employees of the company.

In many ways, Kim's experiences with Francis & Company shaped his journey at eCandy. At Francis & Company, the division of responsibilities between Kim and his co-founder was not clear from the beginning. Kim possessed limited financial knowledge at Francis & Company, which reflected in the poor company financials. Bach then he often ended up with more cash receivables on their books than they actually had cash on hand. In contrast, eCandy was different. Here, Kim took on the role and responsibilities of CEO from day one, carefully scrutinized every investment, and encouraged consistent innovation and excellent product quality. From a technical perspective, Kim established an adherence to lean operations, hypothesis-driven investments, and a more rational sense of when to stop an idea versus when to continue building it.

Looking back on eCandy, Kim understood that "some entrepreneurs have the appetite for ups and downs, while some don't." While he accepted the challenge of running eCandy by himself, he learned that, "entrepreneurs mature very fast as they take on more risk and more responsibility." Kim eventually decided it was time to move on and he sold eCandy.

Course Hero: Intro to Education

In 2008, Kim joined Course Hero as CEO. At the time, Course Hero was a young platform founded by two college-aged co-founders. They were aiming to bring study groups online by providing a place to share academic resources and offering homework help. The way they made Course Hero work is simple: students could upload course content such as notes, presentations, papers, exams, etc. onto the Course Hero site and then navigate it for free or pay a monthly subscription to access the content that has been uploaded.

As CEO, Kim coupled a mission of growing the company while maintaining an efficient system of day-to-day operations. He had the vision of solving student pain points and enabling solutions for higher education. Sourcing from his professional network, Kim brought onboard a cohesive team and within 18 months, they grew Course Hero's user base from zero to over three million users. However, this success did not come without complications. Professors and administrators of universities raised concerns over the content that was uploaded to the site. Some of these controversies exist to this day.

As Course Hero grew, Kim noticed that the higher education industry had not changed as much as potential allowed. There were still many high-tech resources and solutions that had not been tapped into or utilized to their full capability. Tech offerings were not fully integrated with the education system. The challenges in the education industry were multidimensional, and in 2010 Kim left Course Hero to start his own company. He wanted to focus specifically on higher education and work directly with colleges and universities.

Intellus Learning: A Turning Point

Through his immersion in the educational technology industry, Kim caught on to an astounding inefficiency in higher education. Though the cost of attending college had always been a concern for thousands of students in the United States, financial restrictions placed on many

college students were not limited to tuition and often times also included the cost of textbooks and required readings (see **Exhibit 3**: Student Debt Statistics). Meanwhile, colleges and universities work tirelessly year after year to keep their libraries and academic collections up to date and online. Perhaps there was some way to centralize all the resources available across institutions to address the shortcomings in this existing system.

Kim viewed the underutilization of licensed academic content as an unseen pain point for both the academic institutions and the students that they were serving. In 2012 alone, the National Center for Education Statistics reported that educational institutions collectively spent more than $1.5 billion on electronic academic publishing, including e-books, journals, and subscription services. Students spent considerable funds to purchase class material that are already legally available through their own academic institution or affiliates. Other times, students chose not to purchase the material, sometimes at the expense of their own academic performance. After much thought, Kim asked himself how one could bridge the gap in this discrepancy.

The answer was Intellus Leaning. Founded in 2011, Intellus aggregates available academic material into an online platform for instructors to use (see **Exhibit 4**: Intellus Learning: Vision to Reality). The vision behind the idea was to create a platform on which students and faculty could collaborate in order to meet on-demand student needs. Instructors can easily locate existing publishing through an online categorization methodology which also indicates who the owner of the work is as well as its accessibility to the user. The platform uses a proprietary discovery technology that crawls through various content repositories including Open Education Resources (OER), licensed digital assets, and university-specific resources. The output is an extensive index that instructors can use to share the content with students and create their own lesson plans.

After initially addressing the challenge of accessibility, Kim's team decided to take it a step further. In recent years, several large companies, especially those in the technology space, are placing a heavier emphasis on data analytics and machine learning. Within Intellus, Kim's team saw a fantastic opportunity to customize the user's experience on the platform and allow them to source academic material that is similar in nature to what they are already searching. By offering numerous ways to categorize the resources that are offered by the platform, instructors become better able to supplement their lesson plan on a time efficient basis with a more comprehensive set of academic materials.

Intellus also offers a more personalized experience for the recipients of the platform, namely the students. The platform provides a dashboard that allows instructors to analyze which of the provided resources are most effective for students, as well as the frequency with which students are engaging with certain aspects of the material. Instructors are able to publish their own courses online, which automatically aligns their course content from the site with their teaching objectives. By leveraging user data, Intellus provides a holistic learning platform that is based on the site's collection of academic publishing.

Through Intellus, Kim fulfilled his dream of giving back to his parents with societal benefit. When they came to the United States, they had only their education to help them make a living. Paired with their resilience and care, education had always provided Kim with many of the opportunities that he had in life thus far. Intellus embodies the mentorship and community that had shaped Kim's own educational upbringing, and he had found a way to effectively share these characteristics through an online platform. While his entrepreneurial ventures had previously taken him into the realms of e-commerce, his love for education and helping others had never wavered. His past experiences with Francis & Company, eCandy, and Course Hero had all been a culmination leading up to this latest product. Intellus ultimately offered a way to give something back and establish a forward-thinking community that allowed students and teachers to work together to improve learning within higher education.

Generations

By 2016, Intellus was thriving. The site contained more than 50 million electronic resources, home to the world's largest single collection of all open digital content within academia. The company's proprietary technology platform had been implemented in many college and university systems, including California State University. It had the support of multiple venture capitalists, and up to this point had raised north of $4 million in funding. Data analytics and insights had become integral within several industries, and the Intellus team was glad to see the data wave take off within the educational sector. Most importantly, unlike his previous ventures, the vision for Intellus to improve the accessibility and affordability of online educational resources and create a community across the stakeholders within higher education had remained intact.

Through the company's most recent string of successes, Intellus had caught the attention of others in the educational technology sector, specifically Macmillan Learning. Macmillan is an educational publishing company that has recently been moving into the crossroads of educational initiatives and technological innovation. By late 2016, Macmillan had approached Intellus with an offer to acquire the company. At first glance, it seemed evident that Macmillan shared a similar vision for improving and finding data driven solutions to improve the opportunities in higher education. As an entrepreneur, Kim never believed that an acquisition was the "ideal" exit strategy. He only knew that he wanted to do what was best for the future of the company, its employees, and its shareholders. Kim knew that he needed to perform more due diligence before deciding.

Like at many points in his life, when faced with a decision, Kim thought of his family. He thought of his parents, and the values of relationships and education that they emphasized through his upbringing. He thought of his children, whom he hoped would one day be the benefactors of a platform such as Intellus. He then thought of his team, who had experienced the highs and lows with him for the past five years. Despite this great opportunity, Kim wondered how a potential acquisition would affect the users of the platform, and those that are closest to him?

While he stood at the crossroad that would once again determine the fate of a company that he built from the ground up, David asked himself the same question he had been asking through his entire entrepreneurial tenure: "What problem do I want to solve?" For years, David had been focused on expanding the accessibility of online academic resources within higher education. To him, learning was a lifelong experience, and the thought of selling his own company that provides a sustainable platform to expand the opportunities for students to learn proved to be difficult. How much had Intellus already done under his leadership to move toward this goal? Could Macmillan offer the required resources and experience to help Intellus move much closer to this vision? If he leaves Intellus at some point, what should be next?

Appendix

Exhibit 1: Personal Values

David J. Kim brings years of experience in entrepreneurship and industry, and credits his endeavors to some of the lessons he learned through adolescence and education. Many of his personal values come from his mentors, whether they were his parents, university instructors, academic peers, or industry professionals. While there is no way to simplify his recipe for success time-after-time, below are a couple of rules that he likes to live by.

The **definition of success** has changed overtime for Kim. Like many individuals, he first defined success externally, by comparing himself to the achievement of others. Today, he defines success through more personal and intangible means, specifically, through a qualitative lens of how his work is impacting other people. This selfless initiative drives many people who devote their time to the education space, and Kim is no different. However, he hopes that the positive impact that he leaves on others, especially his family, is felt generationally. Kim has found a way to do this at the intersection of technological innovation and education.

Kim's advice to the younger generation includes the emphasis on **investing in relationships**. He states that the people involved in his companies, especially at the founding level, were integral to their success, and the focus on personal relationships extends outside the realm of business. Spread your wings as far as possible, but maintain healthy and genuine relationships with other individuals, especially those who are smarter than you are.

Kim also advices to **remain optimistic and somehow exuberant** with anything that you set your mind to. Be ready to work for the things that you want, and don't settle for anything less than the best. While believing in yourself and your work is of equal importance, it's best to understand what you are working toward, and whom you may be affecting through your work. Motivation can come from many sources, but having a clear purpose in who your work has an impact on, including yourself, paired with the mindset to achieve it, will eventually lead to great outcomes.

Having experienced significant failure early on in his entrepreneurial journey, Kim says it is essential to **let your failures help define you, and not let success get to your head**. Failures and successes are both a part of life for a budding entrepreneur. When looking failure in the eye, strive to learn from the experiences that led to it. Understanding what went wrong is crucial. Equally important, however, is building yourself to be capable enough so as to not repeat the same errors in the future. On the other hand, do not be too surprised when you encounter success. You hard work, dedication, and prior failures led you to that point. As an entrepreneur, you cannot afford to underestimate yourself. Take credit for your success, but do not let it get to your head. One successful project, venture, or exit does not define the entrepreneur's life, nor does it write his legacy. There is always much more to do.

Exhibit 2: David's Timeline to Present Day

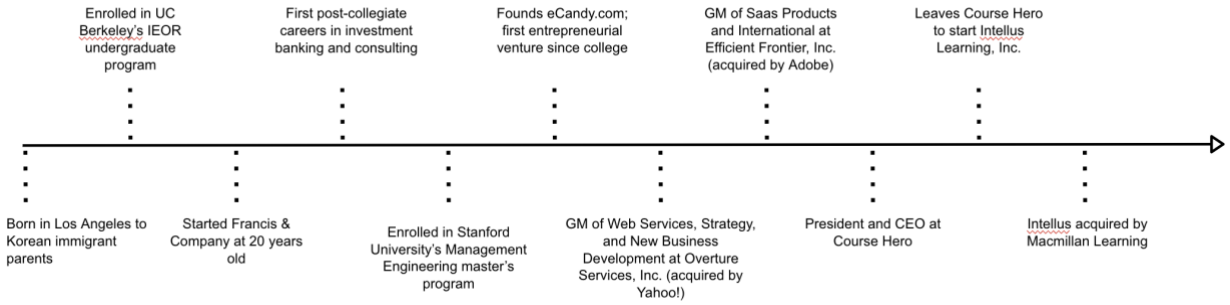
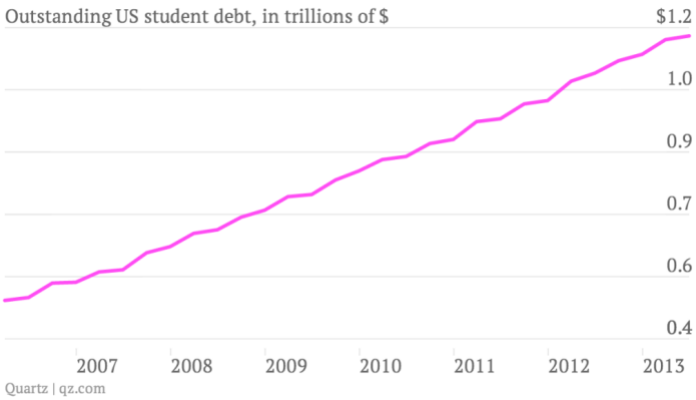


Exhibit 3: Student Debt Statistics



Source: United States Federal Reserve

Student Loan Balance	Number of Borrowers
Less Than $5,000	8,960,200
$5,000 - $10,000	7,740,700
$10,000 - $25,000	12,434,400
$25,000 - $50,000	8,319,600
$50,000 - $75,000	3,341,100
$75,000 - $100,000	1,350,800
$100,000 - $150,000	1,116,500
$150,000 - $200,000	500,400
$200,000+	415,400

Source: Forbes Magazine

Exhibit 4: Intellus Learning – from Vision to Reality

Source: Intellus Learning website

Berkeley Leadership Case Series

Berkeley ENGINEERING

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Mixbook: "We Make Beautiful Design Easy"

"The idea for a company can come from anywhere", and it did for Andrew Laffoon, the 34-year-old co-founder and CEO of Mixbook, a website and service that allows users to use an interactive and collaborative software to create physical photo books.

Background

Andrew Laffoon has been fascinated with engineering since his childhood. It was not hard for his parents to see his interest develop at a young age, as he would constantly deconstruct and then reconstruct electronics. His father bought him a computer when he was nine years old, and Laffoon taught himself how to code, pursuing it as a hobby and source of pocket-money in his teens. Laffoon was also quickly exposed to design. Although he does not consider himself to be an artist, he grew up surrounded by music and art which naturally developed his creativity.

While he was a child of many talents, Laffoon knew since he was twelve years old that he wanted to become an entrepreneur. At fourteen, he combined his passions for coding and entrepreneurship to start a computer consulting business with a friend from high school, creating HTML and Flash websites for their clients. In 2001, Laffoon enrolled in the University of California, Berkeley and continued to operate his computer consulting business as a student.

As his passion for tech entrepreneurship grew stronger at Berkeley, Laffoon decided to major in Industrial Engineering and Operations Research (IEOR). It was in IEOR 171, the technology firm leadership class, that he met someone that would change his life: Professor Jon Burgstone. Burgstone. Burgstone approached Laffoon and a couple of other students in the class to see if they would be interested in a program he was starting: The Entrepreneurship and Technology program. Naturally, Andrew Laffoon accepted in the blink of an eye.

This was a great opportunity for Laffoon. At the time, it was hard for engineering students to take entrepreneurship classes at Berkeley's Haas School of Business since the they would fill up very quickly. The Entrepreneurship and Technology program and classes it offered (IEOR 190A and IEOR 190B) helped Laffoon develop his business acumen. The classes allowed him to interact with actual venture capitalists and CEOs from the industry, giving him insight into what challenges and decisions one would have to face and make as a tech tycoon in Silicon Valley.

In IEOR 161 (Stochastic Processes) and IEOR 171, Laffoon met Aryk Grosz, a like-minded entrepreneur and classmate in the College of Engineering. The pair worked very well together

This case was prepared in the Sutardja Center for Entrepreneurship & Technology by lecturer Stephen Torres, editors Thomas Ferry and Mudit Goyal, and case team Yoonji Lu, Nitin Manivasagan, Neha Burli, Monica Kumaran, and Aneesh Chimbili prepared this case. It was reviewed and approved prior to publication by a company designate. Funding for the development of this case was provided by the University of California, Berkeley and not by the company. Berkeley Engineering cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

and decided to compete in the Cal Case Competition. They won, beating several established consulting teams in the process. Once they realized that they would make great partners, they met with entrepreneurship professor Burgstone to brainstorm ideas for a new startup.

Laffoon notes that both he and Grosz liked having discussions with Burgstone: "Our debates were for fun and to help us come up with new ideas. We never argued solely for the sake of arguing." After going through many ideas with Burgstone, Grosz came up with an idea for yearbooks. Laffoon says:

> "Yearbooks had been controlled by a small group of companies for a long time. We thought, coming from Berkeley, what if we could democratize the yearbook? Instead of ten kids making a yearbook for two thousand, what if we could have a band, a sports team, or even a group of friends create a yearbook that tells their own story? Then, they could customize it however they like. We thought that would be kind of cool. If I were a high school student, I'd want something more personal than the non-personal yearbook. So, we started to explore that, and we started to build the software."

Burgstone, who usually shot down many of the ideas Grosz and Laffoon brainstormed, really liked the online yearbook idea. He strongly encouraged the two of them to start this business: creating an online service for school yearbooks. After a couple of months of meeting up with potential customers, and after carefully constructing a business plan, Laffoon and Grosz founded Mixbook in June of 2006. (See **Exhibit 1** for the founders' portfolios).

Disrupting the Yearbook

As an avid gift giver himself, Laffoon understood the pains that came with the gift creation and giving experience:

> "I made two photo books before, and I found the gift giving experience to be awesome. So, I would give photo books away as gifts. I made one for my girlfriend at the time, now my wife, and for my good friends from Cal when they went back to Singapore. I found that experience to be awesome, but I found the creation experience to be terrible. Better software could simplify the creation process, expanding the market and enabling a lot more people to tell their story."

Understanding this pain enabled Laffoon and Grosz to develop an idea that resonated with them and thousand others: an interactive platform to create a collaborative yearbook. It would allow high school clubs, departments and individuals to collaborate personalize yearbooks to their liking. Laffoon says: "We spoke to a high school administrator about it and he said 'I will absolutely not use this product. You will displace many jobs'". That comment was the first of many motivators for sticking with the idea: The potential for disruption was enormous.

Democratizing Storytelling

While the original photo book idea seemed revolutionary in theory, venture capitalists were hesitant to invest because of the competitiveness of the industry: Shutterfly and Snapfish captured a majority of the market in 2006. What Laffoon found, however, was that photo book technology at the time had glaring problems:

1. It had an awful design, for both the website and actual products. Customers were not happy with their product when they received it in the mail.

2. Products were neither customizable nor personal, making the photo book feel like another stock item purchased from the mass retail store.

3. It did not support the ability to use photos from Flickr, Google etc., prolonging the creation process and centralizing photo uploads to one computer hard drive.

4. The process was not collaborative, making the task long and arduous for the individual designing the photo book.

Within one year of founding Mixbook, Laffoon and Grosz had created a product that addressed all four of these issues, resulting in a comprehensive photo booking service that was beautiful, creative, and enjoyable for the customer. (See **Exhibit 2** to see what Mixbook's current website looks like).

A Change of Heart

Initially, Laffoon and Grosz aimed to bootstrap success by building a company and selling it to start another venture. However, two years into running Mixbook, the co-founders received an email that changed everything. A customer wrote to them about how Mixbook kept her family from shattering after the loss of her dad. She explained that he was the glue of the family, and after his passing, her sister and her mother started drifting apart from each other. After a friend inspired them to build a photo book, she and her family found Mixbook and started creating a book filled with her father's memories. The whole family worked on the album, and together they laughed and cried, reliving cherished memories. More than merely the final product, the process brought them closer together. Laffoon stated that "for us it was a sixty-seven-dollar purchase, but for them, it was a transformation of their life and relationships."

Laffoon and Grosz realized that they were doing something real and powerful - something that fostered human connection. This encouraged them to set two goals for Mixbook: to empower people to be creative and connect with those they care about most. For Laffoon, design and development went hand in hand. He had a creative side that he could express, and knew that everyone else had that same creative side and story yearning to get out. For him, the greatest disease humans face as inherently social beings is loneliness, and the only way to cure it is to be with others. What motivated Laffoon and Grosz in the early stages of their company was remembering the moments when they felt connected to people.

Generating Profits

Laffoon understood early on that Mixbook's revenue would come from the profits of the printed photo books. Mixbook's core business model was printing products. While most photo book companies signed a deal with one printer, he realized that if he partnered with several printing companies, he could have them compete with one another, allowing him to get better prices. Laffoon and Grosz wanted to deliver the highest quality of photo books, so they were very selective about which companies they let into their network. If the printer did not work out, they would shut it off.

What differentiated Mixbook from other photo book companies was that Laffoon and Grosz invested a lot of resources into assuring quality. They believed that the product with the highest quality and the best experience would win. The story of the customer bonding with her mother and sister over her father was not only a moment that solidified and reaffirmed Laffoon's core business value, but also one that solidified his choice to stay away from advertisements in Mixbook's services and products:

> "No one wants to see periodic ads when they are designing this piece with their loved ones nor do they want to see every other page be an ad in their photo book."

Challenges in Traction

In June of 2007, Laffoon and Grosz launched their product with the $100,000 that they got from angel investors who told them to focus on photo books instead of yearbooks. Initially, however, only friends and family used the product. Laffoon and Grosz decided to capitalize on the rise of Facebook as a platform to gain traction. They created an application called Photobooks within Facebook. The application would allow a user to tag friends into a photo, and the friends would be sent a link to download the application to view the photo. This created a chain of users. Within 2 months, the number of users using Photobooks organically grew to 2 million.

While this method added more users to the network, not many paying customers converted to Mixbook from the Facebook app. Laffoon and Grosz brainstormed other ways to gain traction. They decided to incorporate Automix, which used photo metadata to arrange the pictures users chose to put in their photo book, to add more ease and variety in the user experience.

Laffoon and Grosz then sought out to get direct user feedback by calling users who converted to paying customers. They found that the users who converted to customers loved the design and the simplicity of Mixbook's user interface. In July of 2008, Laffoon and Grosz started generating more revenue. However, when they went to pitch to 50 venture capitalists, the venture capitalists said that Mixbook needed to be profitable to get funding. Therefore, the pair continued calling users to find out what to add to Mixbook. They found that customers wanted more features, more hardcover books, and more design options while creating their books.

Laffoon and Grosz also reached out to the Band of Angels, who funded them solely based on the success of Photobooks. (See **Exhibit 3** for funding information). However, they only received one term sheet, and while negotiating, even that deal fell through. Luckily, Laffoon and Grosz knew the principals at that firm from Berkeley. One of the investors, Ian Sobieski, was the professor for IEOR 190B at Berkeley when Laffoon was a student. Together, they were able to get the deal done just weeks before the financial crisis hit in July of 2008. Laffoon realized that:

> "Who you know matters, so much. I try to keep in touch with the people I met at Cal, and a few of them are venture capitalists, entrepreneurs, etc. One of them even ran the app store at Google Play for a while, so I literally would call him and ask him to feature Mosaic [a mobile version of their scrapbooking product]. If I hadn't known him, I wouldn't have gotten that opportunity"

New Technologies

After raising capital in 2008, Laffoon and Grosz began experiencing success. Annual revenue increased from $1 million to $4 million, and by the next year it further increased to $15 million. Additionally, Shutterfly acquired a major competitor for $300 million in 2012, which lead to major venture capitalist interest in their field, resulting in an additional ten million dollars of funding for Mixbook. It went from a "no-success" startup to Forbes' "30 under 30". (See **Exhibit 4** and **Exhibit 5**). This inspired Laffoon to further expand Mixbook.

In 2012, Laffoon and Grosz created Mosaic, a mobile version of their scrapbooking product, which generated 5 million dollars in less than 2 years. Laffoon notes:

> "When we tried to create Mosaic, there was a whole bunch of other things going on at the time. There was the fact that we wanted to prove that men could actually make photo books. We also didn't know how scalable our market was."

Shortly after Mosaic was released, Laffoon and Grosz began working on Montage, an AI powered algorithm behind scrapbook creation.

"Rebranding" Mixbook

Laffoon's and Grosz's investment in new technology and poor hires led to a move away from Mixbook's core business. While Mosaic and Montage were growing nicely, they were still not as effective as their core business. In the process, Laffoon had stopped calling customers and was losing touch with their thoughts and complaints. This was a mistake and early numbers proved it: by focusing on its core audience, Mixbook was able to grow from $300 revenue/month in 2008 to $90000/month in 2009. Moreover, by figuring out how to market to their customers, Laffoon and Grosz were able to grow Mixbook from $75,000 annual revenue to $1.18 million over the same period.

Upon that realization, they began realigning the company's vision to focus more on their current customer base. In this process Laffoon found that despite Shutterfly's competition, Mixbook was able to attract customers who preferred Mixbook's unparalleled quality. Nearly 80 percent of their new customers start with Shutterfly's product and make the switch to Mixbook. The core business continued to work even though they had shifted attention away from it while designing Mosaic and Montage.

Laffoon embarked on a process to rebrand Mixbook and the logo was changed. (See **Exhibit 6** and **Exhibit 7**). Laffoon realized that the main things customers were looking for were better design and customization flexibility. The reason why they came to Mixbook in the first place. When he questioned Shutterfly customers and Snapfish customers, they had the same complaints. This was the "aha!" moment for Laffoon: "If we just double down on our core audience, go back to our original vision, and actually just re-embrace that, we are going to get pretty good results". The rebranding doubled Mixbook's year-over-year growth.

Lessons Learned

Laffoon emphasizes time and time again that the "idea for a company can come from anywhere". In the case of Mixbook, Laffoon and Grosz identified pain points in their own lives, and figured out a way to remedy those pains.

It is also important to realize that not all products are going to be immediately recognized as the "next big thing". The entrepreneur should not get discouraged if the idea does not gain traction at first or if people do not catch onto the vision. Mixbook did not do very well initially, but it slowly started taking off. Laffoon created a business that excited him personally, incentivizing him to keep pushing through the hard times.

Mixbook wouldn't be where it is today without the risks Laffoon and Grosz took. Laffoon specifically encourages taking risks, especially those that "diverge from the conventional". He also stresses not to do it for the money, as "the best ideas come from personal experiences and ties that [one] has to the company." By disrupting the photo book industry, Laffon and Grosz were able to create a product that is still breaking new grounds.

Understanding the needs of the customers is also a huge point of emphasis for Laffoon. When Mosaic was released, Laffoon states that he had stopped calling customers: "I wasn't in touch with what the customers were talking about". It is a lesson that he reflects on to this day, because "losing touch with the customers means losing touch with what the business is all about".

Finally, "Trust your gut" is something that Laffoon stresses time and time again. When dealing with so many different people and opportunities, it becomes hard to figure out the right path. Most people, have a gut instinct that tells them what to do. Laffoon says without his gut instinct, Mixbook would not have been the successful company that it is today.

Future

Shutterfly no longer poses a threat to Mixbook and customers prefer Mixbook's product, software, and customer experience. These are very hard to replicate and Mixbook is committed to keeping its core audience, the design loving public, happy. For Laffoon, the best way to keep Mixbook's core audience happy is to find new and unique ways to incorporate Mixbook's mission into everyday business. For instance, Laffoon and Grosz revisited Mosaic and are currently working on aligning it with Mixbook's core product to expand its user base even further by making scrapbooking easy for casual photographers who use their mobile phones for pictures.

Laffoon is constantly thinking about the future. "What keeps me up at night is Amazon entering the market, and how people will respond. Is it going to lead to a massive price war?" Amazon is growing very fast and is making its mark on many markets. How would they fare in the photo booking business? It can compete with Shutterfly and other companies by offering lower prices and by shipping the photo books must faster. However, Laffoon believes that Mixbook will be able to compete: Mixbook's margins are very good, and are substantially better than Shutterfly's.

Moreover, since Mixbook's software, business model, and user experience will be difficult for competitors to replicate, Amazon's entrance into the market will not have as severe of an impact on Mixbook as it will on Shutterfly. Those companies that offer photo books at a mediocre quality will have a much more difficult time dealing with the low prices and faster shipping speeds that Amazon will bring to the market.

Laffoon also notes that Mixbook has a loyal and growing customer base, a growing niche of people who care about design and want to express themselves creatively. The smaller size of operation and attention to customer experience are Mixbook's biggest strengths. Laffoon's focus for the future is on the people who already love Mixbook. By staying true to the company's original vision, Laffoon aims to continue launching lovable products that will empower Mixbook's users.

Mixbook faced many challenges in the past and prevailed. Future challenges and changes in the photo book industry will merely be another test for Laffoon, Grosz, and the Mixbook team.

Exhibit 1 Andrew Laffoon's and Aryk Grosz's Portfolio

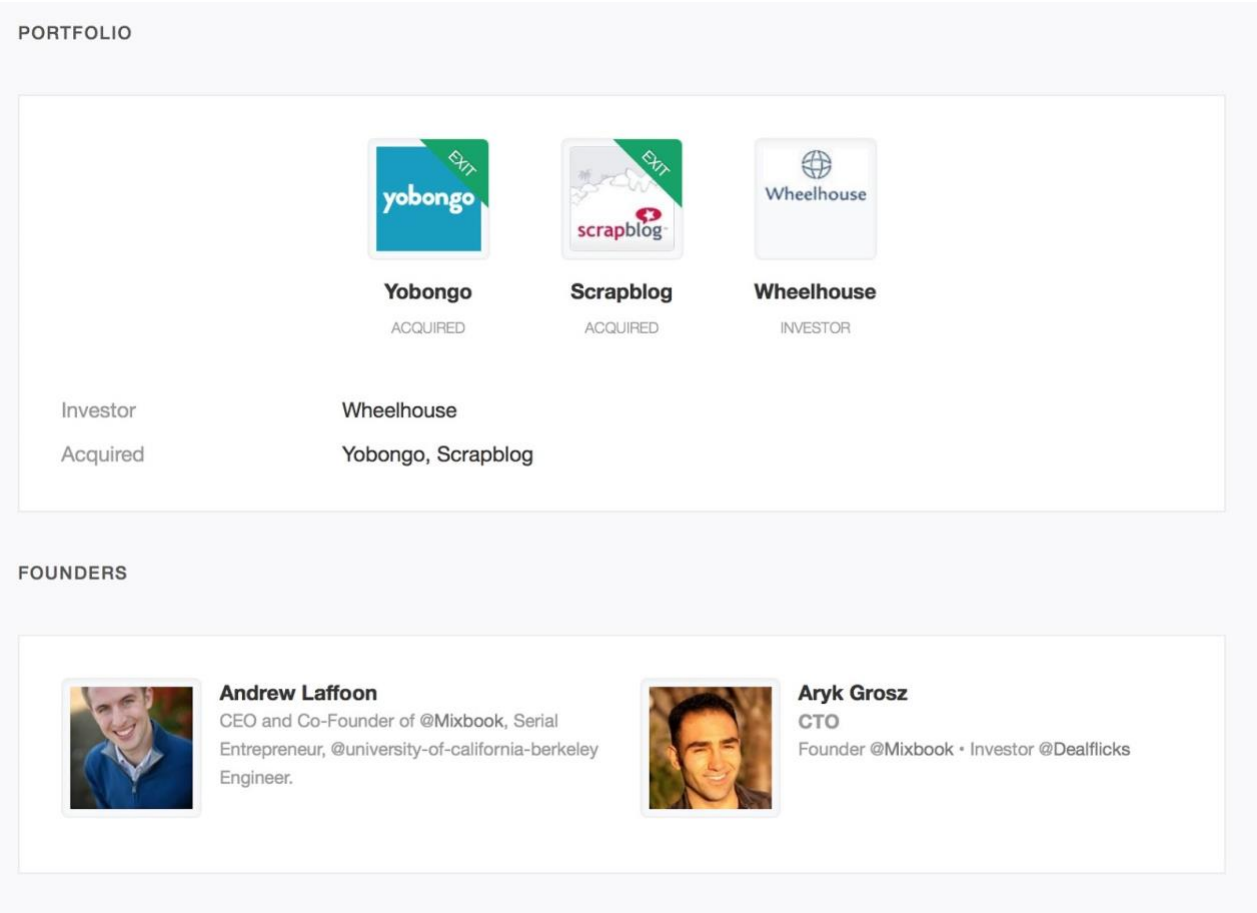


Exhibit 2 Current Website

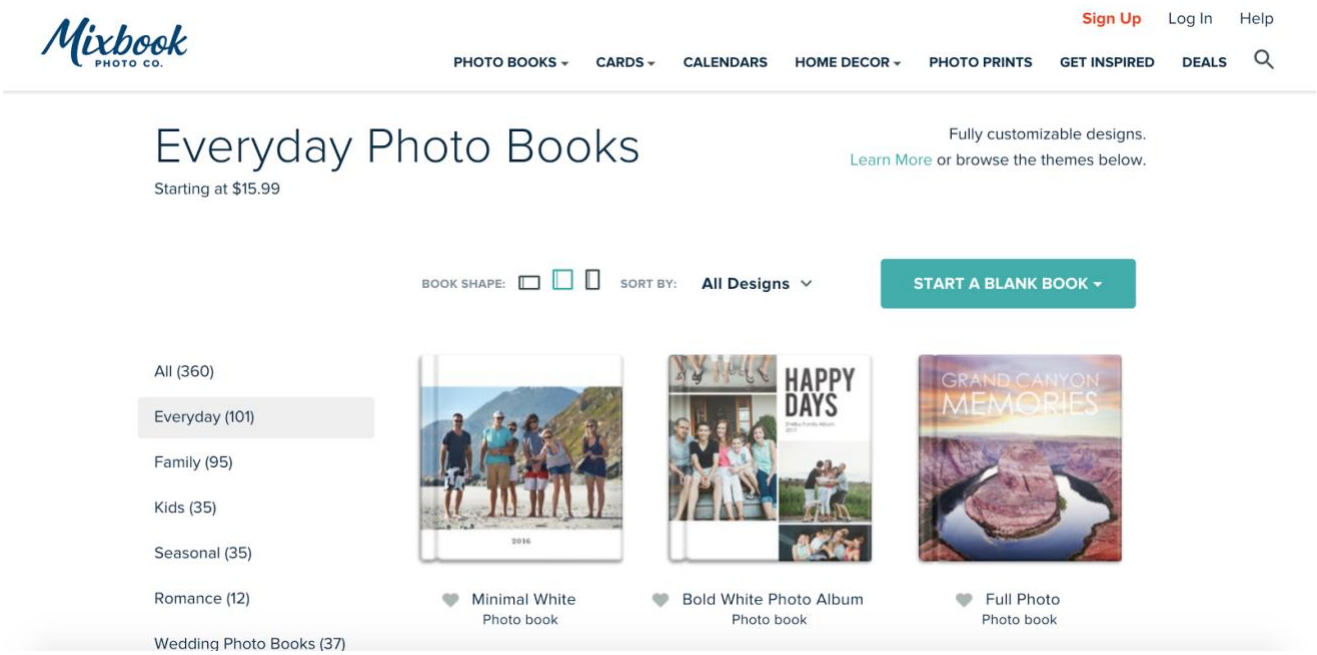
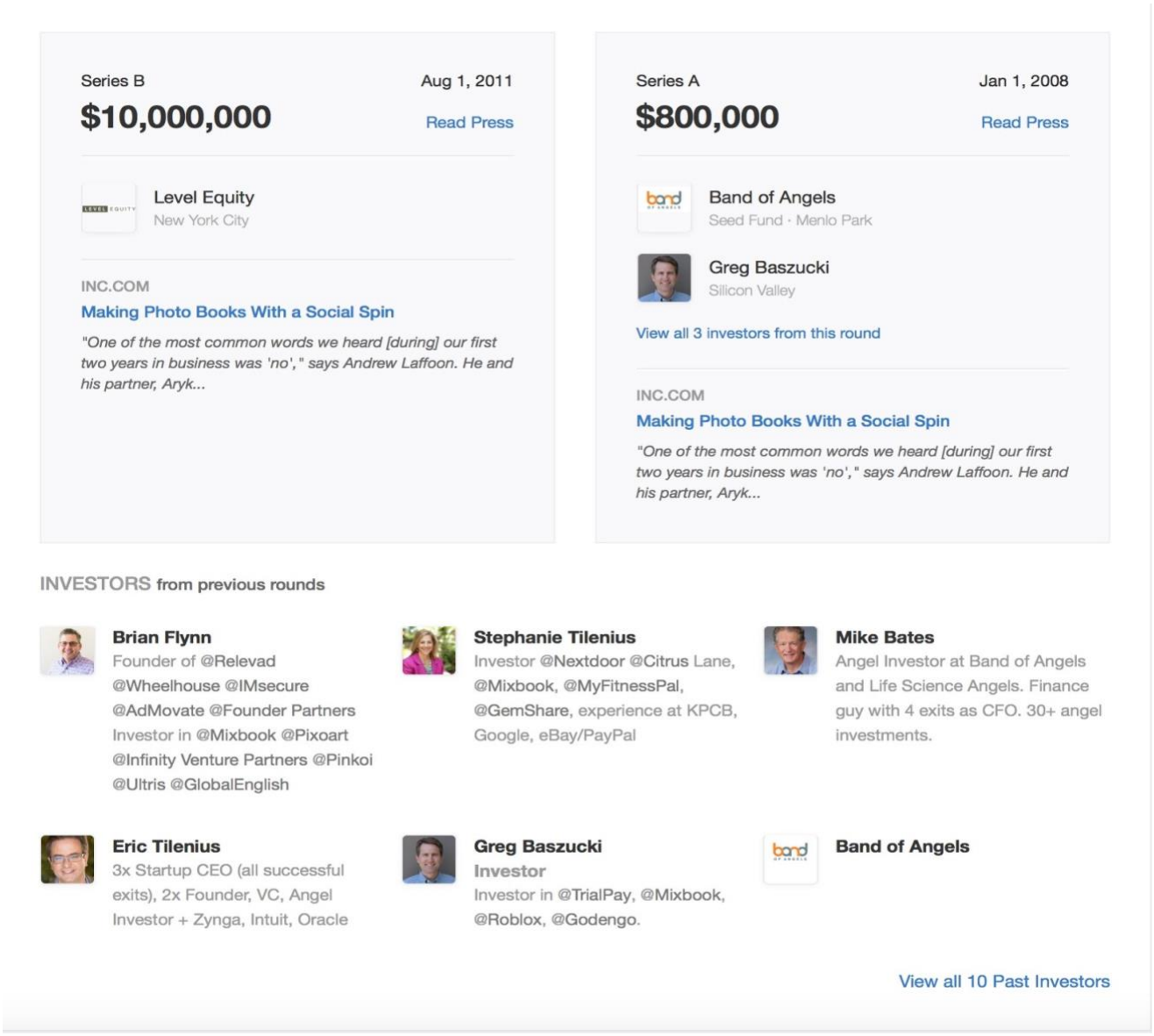


Exhibit 3 Funding Information



Mixbook on Forbes Lists

#43 America's Most Promising Companies (2013)

#43 Mixbook

Revenue As of February 2013

$25.1 Million

Industry	**Retailing**
Founded	**2006**
CEO	**Andrew Laffoon**
Website	**http://www.mixbook.com**
Employees	**60**
Founders	**Andrew Laffoon, Aryk Grosz**
Fiscal Year End	**Dec 31, 2012**
Headquarters	**Palo Alto, California**

A website and mobile application for creating photo books, cards and calendars. Customers use Mixbook's design software for free, but pay for print services. Prices range from $6.99 for mini photo albums to $54.99 for hardcover coffee table books. Founders Andrew Laffoon and Aryk Gosz began the company after winning a business competition as undergraduates at UC Berkeley in 2005.

Exhibit 5 News Article on Andrew Laffoon

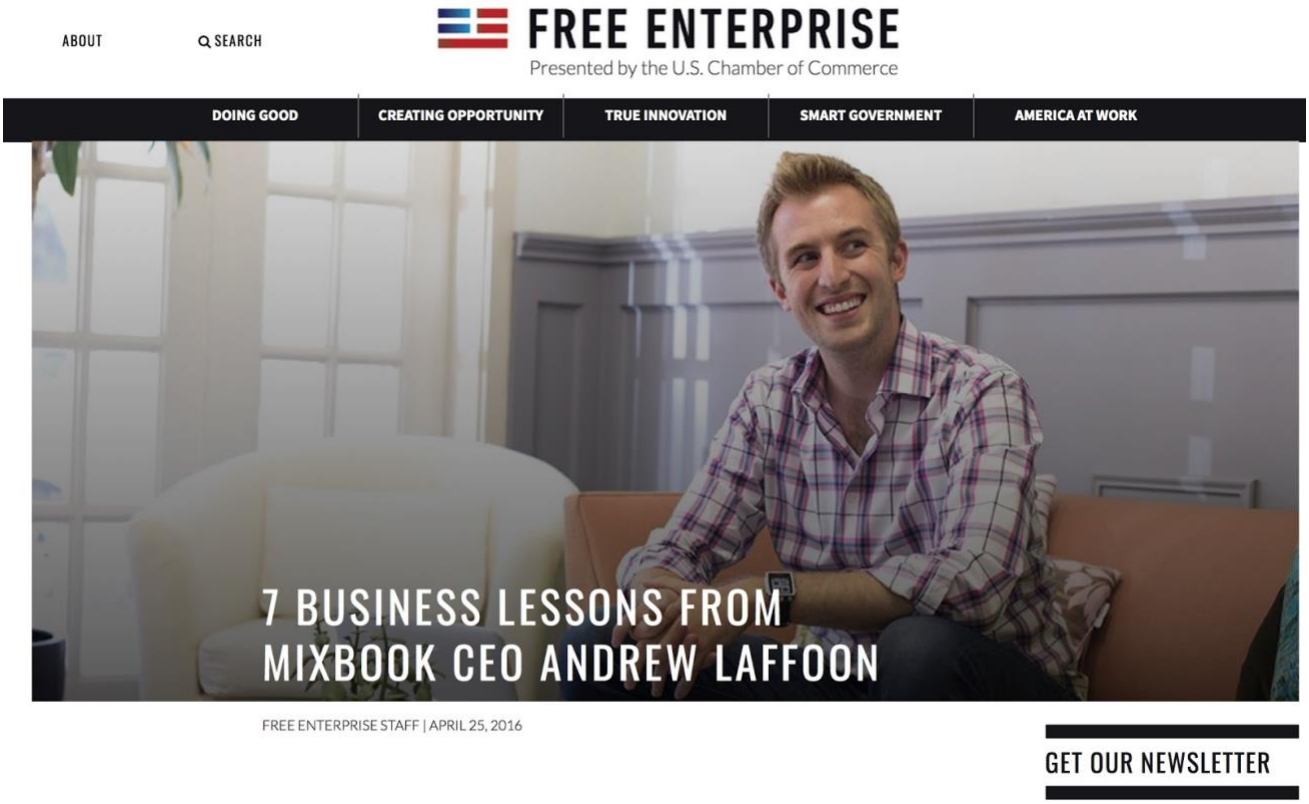


Exhibit 6 Mixbook's Old Logo

Exhibit 7 Mixbook's New Logo

Exhibit 8 The Sutardja Center for Entrepreneurship and Technology

20-170-001

November 26, 2017

STEPHEN TORRES
YOONJI LU
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MONICA KUMARAN
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Mixbook: "We Make Beautiful Design Easy"

Andrew Laffoon is the 34-year-old co-founder and CEO of Mixbook, a website and service that allows users to use an interactive and collaborative software to create physical photo books. Mixbook's office is located in Redwood City, CA and, according to Crunchbase, has approximately 50-100 employees. Through Mixbook, a customer can load photos from either their own computer or through various sources such as Facebook and Pinterest. Choosing from various templates, customers can jointly design their own products. A few days after the customer completes the design, Mixbook prints and assembles the design into a customized, high-quality photo book. After its founding in 2006, the company transformed from a yearbook-based model to scrapbooking, all supported by the same notion of making beautiful design easy and simple.

Andrew Laffoon

Laffoon was fascinated with engineering since his childhood. It was not hard for his parents to see his interest develop at a young age, when he would deconstruct and then reconstruct electronics and toys in his house. His father, a pastor, bought him a computer when he was nine years old. Since then, Laffoon taught himself coding and pursued it as a hobby as well as a source of extra income in his teens. Laffoon was also exposed to design at a very young age. Although he does not consider himself to be a designer, he grew up around music and art, and creativity came naturally to him as a result.

While he was a child of many talents, Laffoon knew since he was twelve years old that he wanted to become an entrepreneur. At the age of fourteen, he combined both his passions of coding and entrepreneurship to start a computer consulting business with a friend from high school. The business was creating HTML and Flash websites for clients. In 2001, Laffoon attended the University of California, Berkeley (UC Berkeley), and during his time at Berkeley, he continued to operate his computer consulting business.

Since his passion to become a tech entrepreneur gained even more traction during his time at UC Berkeley, Laffoon decided to major in Industrial Engineering and Operations Research (IEOR). This allowed him to combine his passion for technology and business. It was in IEOR 171, the technology leadership class, where he met Professor Jon Burgstone. Burgstone approached Laffoon and a couple of other students in the class to see if they would be interested in an entrepreneurship program he was starting: The Entrepreneurship and Technology program.

This was a great opportunity for Laffoon. At the time, it was hard for engineering students to take entrepreneurship classes at UC Berkeley's Haas School of Business since the classes would fill up very quickly. The entrepreneurship program and the classes it offered (such as IEOR 190A and IEOR 190B) helped Laffoon develop his business acumen. Such classes allowed him to interact with actual venture capitalists and CEOs from the industry, giving him insight into what challenges and decisions one would have to face and make as a tech tycoon in the Silicon Valley.

In IEOR 161 (Stochastic Processes) and IEOR 171, Laffoon met Aryk Grosz, a like-minded entrepreneur and classmate in the College of Engineering. The pair worked very well together and decided to compete in the Cal Case Competition. They won, beating several established consulting teams in the process. Once they realized that they would make great partners, they met with entrepreneurship professor Jon Burgstone to brainstorm ideas for a new startup. Laffoon notes that both he and Grosz liked having discussions with Burgstone: "Our debates were for fun and to help us come up with new ideas. We never argued solely for the sake of arguing." After going through many ideas with Burgstone, Grosz came up with an idea for yearbooks. Laffoon says:

> Yearbooks had been controlled by a small group of companies for a long time. We thought, coming from Berkeley, what if we could democratize the yearbook? Instead of ten kids making a yearbook for two thousand, what if we could have a band, a sports team, or even a group of friends create a yearbook that tells their own story? Then, they could customize it however they like. We thought that would be kind of cool. If I were a high school student, I'd want something more personal than the non-personal yearbook. So, we started to explore that, and we started to build the software.

Burgstone, who usually shot down many of the ideas Grosz and Laffoon brainstormed, really liked the online yearbook idea. He strongly encouraged the two of them to start this business: creating an online service for school yearbooks. After a couple of months of meeting up with potential customers, and after carefully constructing a business plan, Laffoon and Grosz founded Mixbook in June of 2006. (See **Exhibit 1** for the founders' portfolios).

Disrupting the Yearbook

As an avid gift giver himself, Laffoon understood the pains that came with the gift creation and giving experience:

> I made two photo books before, and I found the gift giving experience to be awesome. So, I would give photo books away as gifts. I made one for my girlfriend at the time, now my wife, and also for my good friends from Cal when they went back to Singapore. I found that experience to be awesome, but I found the creation experience

to be terrible. Better software could simplify the creation process, expanding the market and enabling a lot more people to tell their story.

Understanding this pain allowed Laffoon and Grosz to develop an idea that resonated with them and others who also experienced this pain: an interactive new platform to create a collaborative yearbook. This would allow many high school clubs, departments and individuals to collaborate together on the yearbook. It would also allow them to personalize the yearbook to their liking. Laffoon says: " We [Aryk Grosz and Andrew Laffoon] spoke to a high school administrator about it and he said ' I will absolutely not use this product. You will displace many jobs'". That comment was one of many motivators for sticking with the interactive product aspect of Mixbook.

Laffoon and Grosz knew they had the potential to do something very special after witnessing the administrator's shocked reaction. However, while students were very excited about telling their personal stories through the interactive yearbook, teachers were not so keen on a fully student-run yearbook. They preferred an administrative oversight of the yearbook in order to generate revenue for the school. Teachers and school staff members also disliked handing over most of the creative control over to high school students.

Democratizing Storytelling

While the original photo book idea seemed revolutionary in theory, venture capitalists were hesitant to invest because of the competitiveness of the industry. Shutterfly (which would later become Mixbook's main competitor) and Snapfish captured a majority of the market in 2006. What Laffoon found, however, was that photo book technology at the time had glaring problems:

Issues in Photo Book Technology

1. Awful design, for both the website and actual products. Customers were not happy with their end product when they received it in the mail.
2. Neither customizable nor personal, making the photo book feel like another stock item purchased from the mass retail store.
3. Did not support the ability to use photos from Flickr, Google etc., prolonging the creation process and centralizing photo uploads to one computer hard drive.
4. Not collaborative, making the task long and arduous for the individual designing the photo book.

Within one year of the founding of Mixbook, Laffoon and Grosz created a product that addressed all four of these issues, resulting in a comprehensive photo booking service that was beautiful, creative, and enjoyable for the customer to use. The final version Mixbook released in 2007. (See **Exhibit 2** to see what Mixbook's current website looks like).

A Change of Heart

Initially, Laffoon and Grosz saw themselves getting to bootstrapped success by building a company, then selling it to start a new venture. However, two years into running Mixbook, the co-founders received an email that changed everything. They got an email from a customer who wrote about losing her dad. She told Laffoon and Grosz that her father was the glue of the family, and after his passing, her sister and her mother grew apart from each other. After getting inspired by a friend to build a photo book, she and her family looked up Mixbook and started creating a photo book filled with her father's memories. The whole family worked on the album, and together they laughed and cried while making this book about their dad. Rather than looking at her father's life and grieving over his death, the customer and her family were able to revisit memories through their photo sharing experience. Laffoon stated that "for us

[Laffoon and Grosz] it was a sixty-seven-dollar purchase, but for them [the customer and her family], it was a transformation of their life and relationships."

Laffoon and Grosz realized that they were doing something real and powerful - something that fostered human connection. This experience encouraged them to make two goals for Mixbook: to empower people to be creative and to allow people to tell their own story. For Laffoon, design and development went hand in hand. He discovered that he had a creative side that he could express, and knew that everyone else had that same creative side and story yearning to get out. Laffoon noted that the greatest disease humans face as individuals of society is loneliness, and the only way to cure it is to be with other people. What motivated Laffoon and Grosz in the early stages of their company was remembering the moments that they felt connected to people.

Generating Profits

Laffoon decided early on that Mixbook's revenue would come from the profits of the printed photo books. Mixbook's core business model was printing products. Laffoon realized that most photo book companies signed a deal with one printer; however, he realized that if he partnered with several printing companies, he could have the printing companies compete with one another, allowing him to get better prices on printing. Laffoon and Grosz wanted to deliver the highest quality of photo books, so they were very selective about which companies they let into their network. If the printer did not work one time, they would shut it off.

What differentiated Mixbook from other photo book companies was that Laffoon and Grosz invested a lot of resources into the metrics of quality. They believed that the product that offered the highest quality and the best experience would win. The story of the customer bonding with her mother and sister over her father was not only a moment that solidified and reaffirmed Laffoon's core business value, but also one that solidified his choice to stay away from advertisements in Mixbook's services and products: "No one wants to see periodic ads when they are designing this piece with their loves ones nor do they want to see every other page be an ad in their photo book." Clearly, Mixbook sought to offer an uninterrupted customer experience.

Challenges in Traction

In June of 2007, Laffoon and Grosz launched their product with the $100,000 that they got from venture capitalists who told them to focus on photo books instead of yearbooks. Initially, however, only friends and family used the product. Laffoon and Grosz decided to capitalize on the rise of Facebook as a platform to gain traction. They created an application called Photobooks within Facebook. The application would allow a user to tag friends into a photo, and the friends would be sent a link to download the application in order to view the photo. This created a chain of users. Within 2 months, the number of users using Photobooks organically grew to 2 million.

While this method added more users to the network, not many paying customers converted to Mixbook from the Facebook app. Laffoon and Grosz brainstormed other ways to gain traction. They decided to incorporate Automix, which used photo metadata to arrange the pictures users chose to put in their photo book, to add more ease and variety in the user experience.

Laffoon and Grosz then sought out to get direct user feedback by calling users who converted to paying customers. They found that the users who converted to customers loved the design and the simplicity of Mixbook's user interface. In July of 2008, Laffoon and Grosz started generating more revenue. However, when they went to pitch to 50 venture capitalists, the venture capitalists said that Mixbook needed to be profitable in order to get funding.

Therefore, the pair continued calling users to find out additional features to add to Mixbook. They found that customers wanted more features, more hardcover books, and more design options while creating their books.

Laffoon and Grosz also reached out to the Band of Angels, who funded them solely based on the success of Photobooks. (See **Exhibit 3** for funding information). However, they only received one term sheet, and while negotiating, even that deal fell through. Luckily, Laffoon and Grosz knew the principals at that firm from Berkeley. One of the investors, Ian Sobieski, was the professor for IEOR 190B at Cal when Andrew was a student. By working together, they were able to get the deal done just weeks before the financial crisis hit in July of 2008. Following the economic collapse in 2008, board members challenged Laffoon and Grosz to bring Mixbook to profitability. Just one year later, Mixbook was able to grow from $300 revenue/month to $90000/month by focusing on its core audience. Moreover, by figuring out how to market to their customers, Laffoon and Grosz were able to grow Mixbook from 75,000 customers in 2008 to 1.18 million customers in 2009.

New Technologies

Laffoon and Grosz began experiencing success in 2008 after raising capital. Annual revenue increased from $1 million to $4 million, and by the next year revenue further increased to $15 million. In 2012, Shutterfly acquired a major competitor for $300 million, leading to major venture capitalist interest in their field, resulting in an additional ten million dollars of funding. Mixbook went from a "no-success" startup to now getting press through Forbes' "30 under 30". (See **Exhibit 4** for the Forbes article, and see **Exhibit 5** for a news article published on Andrew Laffoon). This inspired Laffoon to further expand Mixbook using the latest and trendiest technology.

In 2012, Laffoon and Grosz created Mosaic, a mobile version of their scrapbooking product, which generated 5 million dollars in less than 2 years. Laffoon notes:

> When we tried to create Mosaic, there was a whole bunch of other things going on at the time. There was the fact that we wanted to prove that men could actually make photo books. We also didn't know how scalable our market was.

Shortly after Mosaic was released, Laffoon and Grosz began working on Montage, an AI powered algorithm behind scrapbook creation.

"Rebranding" Mixbook

Laffoon's and Grosz's investment in new technology and marketing troubles due to poor hires led to what, in hindsight, was a move away from the core business of Mixbook . Laffoon's next great realization was that while Mosaic and Montage were growing nicely, they were still not as effective as their core business. He also realized that he had stopped calling customers and therefore was losing touch with their thoughts and complaints. He and Grosz began realigning the company vision to focus more on their current customer base. In this process Laffoon found that despite Shutterfly's competition, Mixbook was able to attract customers who preferred Mixbook's unparalleled quality. Every year, around eighty percent of their new customers start with Shutterfly's product and make the switch to Mixbook. The core business continued to work even though they had shifted attention away from it while designing Mosaic and Montage.

Upon coming to this realization, Laffoon embarked on a process to rebrand Mixbook. The logo was changed. (See **Exhibit 6** for the old logo, and see **Exhibit 7** for the new logo). Mixbook, Montage, and Mosaic still existed, and it was difficult to manage all three of them. So, Laffoon tried to think of ways to continue carving out a niche for Mixbook in the market. As an engineer, Laffoon initially thought that building the best product was all that mattered in order

to survive and grow in the industry. However, he realized that this was completely untrue: “Who you know matters, so much. I try to keep in touch with the people I met at Cal, and a few of them are venture capitalists, entrepreneurs, etc. One of them even ran the app store at Google Play for a while, so I literally would call him and ask him to feature Mosaic. If I hadn’t known him, I wouldn’t have gotten that opportunity”.

During this rebranding process, Laffoon realized that the main things customers were looking for were better design and customization flexibility. That was why these customers came to Mixbook in the first place. When he questioned Shutterfly customers and Snapfish customers, they had the same complaints. This was the “aha!” moment for Laffoon: “If we just double down on our core audience, go back to our original vision, and actually just re-embrace that, we are going to get pretty good results”.

The rebranding launched a month and a half ago. So far, the rebranding efforts have doubled Mixbook’s year-over-year growth.

Lessons Learned

Laffoon emphasizes time and time again that the “idea for a company can come from anywhere”. In the case of Mixbook, Laffoon and Grosz identified pain points in their own lives, and figured out a way to remedy those pains. Often times people get carried away with trying to find the right idea in the right place at the right time, but Laffoon says that there is no such thing.

It is also important to realize that not all products are going to be immediately recognized as the “next big thing”. It is important not to get discouraged if the idea does not gain traction at first or if people do not catch onto the vision. Mixbook which did not do very well initially, slowly started taking off. Laffoon created a business that excited him personally, which incentivized him to keep pushing through the hard times.

Mixbook is also where it is now because of the risks Laffoon and Grosz took. Laffoon specifically encourages taking risks, especially risks that “diverge from the conventional”. He also stresses not to do it for the money, as “the best ideas come from personal experiences and ties that [one] has to the company.” By disrupting the photo book industry, Laffon and Grosz were able to create a product that is still breaking new grounds.

Understanding the needs of the customers is also a huge point of emphasis for Laffoon. When Mosaic was released, Laffoon states that he had stopped calling customers: “I wasn’t in touch with what the customers were talking about”. He notes that it is a lesson that he still reflects on to this day, because “losing touch with the customers means losing touch with what the business is all about”.

“Trust your gut” - something that Laffoon stresses time and time again. When dealing with so many different people and opportunities, it becomes hard to figure out the right path. Most people, however, have a gut instinct that tells them what to do. Laffoon says that if he had not listened to his gut instinct, Mixbook would not have been the successful company that it is today. That being said, it is still important to set boundaries for risks and to make sure that the decisions being taken are reasonable.

Future

Shutterfly no longer poses a major threat to Mixbook. Customers are much more satisfied with Mixbook’s product, software and customer experience. These are core aspects that are very hard to replicate. Mixbook is committed to keeping its core audience happy- the design loving public. Laffoon notes that one of the ways to keep Mixbook’s core audience happy is to find new and unique ways to incorporate Mixbook’s mission into everyday business.

For instance, Laffoon and Grosz revisited Mosaic and are currently working on aligning it with Mixbook's core product. They are doing so by integrating Mosaic with an easy-to-use software interface, applying aspects of Mixbook's streamlined web application to the phone. This approach to Mosaic would allow Mixbook to expand its user base even further by making scrapbooking easy for casual photographers who use their mobile phones for pictures.

"What keeps me up at night is Amazon entering the market, and how people respond. Is it going to lead to massive price war?" Amazon is growing very fast and is making its mark on many markets. How would they fare in the photobooking market? It can compete with Shutterfly and other companies by offering lower prices and by shipping the photo books must faster. However, Laffoon notes that Mixbook would be able to deal with the potential issues through a tech investment he made earlier. Mixbook's margins are very good, and are substantially better than Shutterfly's. Moreover, since Mixbook's software, business model, and user experience would be difficult for competitors to replicate, Amazon's entrance into the market would not have a severe impact on Mixbook. Meanwhile, companies such as Shutterfly that offer photo books at a mediocre quality would have a much more difficult time dealing with the low prices and faster shipping speeds that Amazon would bring to the market.

Laffoon also notes that Mixbook has a loyal and growing customer base, a growing niche of people who care about design and want to express themselves creatively. The smaller size of operation and attention to customer experience are some of Mixbook's biggest strengths. Laffoon's focus for the future is to focus on people who already love Mixbook. By staying true to the company's original vision, Laffoon aims to continue launching products that Mixbook's users would love as well as be empowered by.

Laffoon faced many challenges in the past and prevailed. Future challenges and changes in the photo book industry will merely be another test for Laffoon.

Beyond Mixbook

As a UC Berkeley alumnus, Laffoon also has plans for the Sutardja Center for Entrepreneurship and Technology (abbreviated SCET). (See **Exhibit 8** for the SCET logo). The SCET is UC Berkeley's center for the study and practice of entrepreneurship - specifically, entrepreneurship in the tech industry. Although the SCET was founded towards the end of Andrew's time as a student, he still benefited from several of the programs. Courses such as IEOR 190A and IEOR 190B were key in helping Laffoon achieve his dream of becoming an entrepreneur in the tech industry. Laffoon is making an effort to speak at the SCET at least once a year, to inspire and educate students who have similar aspirations.

One of Laffoon's major concerns about the SCET is the availability of resources. He says: "I think Sutardja Center does not have enough visibility. It does not have enough resources, and it does not have enough professors and classes. It also does not have enough VCs to go around. That's something I really want to work on improving." He notes that the SCET is one of the most exciting things happening at Berkeley right now, so he wants to find ways to get the IEOR department more resources. Laffoon states that the promotion of Phil Kaminsky to Associate Dean of the College of Engineering is a "step in the right direction, since he is more inclined to funnel resources off to IEOR, which will make it to SCET".

A final issue that Laffoon points out is Berkeley's location.

> The reason Stanford gets more resources is because all of the VCs are right there. Even when we were in Palo Alto, I was going to teach and mentor Stanford students since it was so easy. It's sad to say, but it's so hard to get to Berkeley. I try to make an effort to come back, because most people don't, since they don't live there.

He notes that by getting more students involved in the SCET, venture capitalists will be more inclined to come to Berkeley to offer resources and mentor students. He believes that if entrepreneurs like him take the initiative to come to Berkeley and get more students interested in tech-centric entrepreneurship, then the program's popularity will increase, which will, in turn, get more venture capitalists interested in funding the program.

Exhibit 1 Andrew Laffoon's and Aryk Grosz's Portfolio

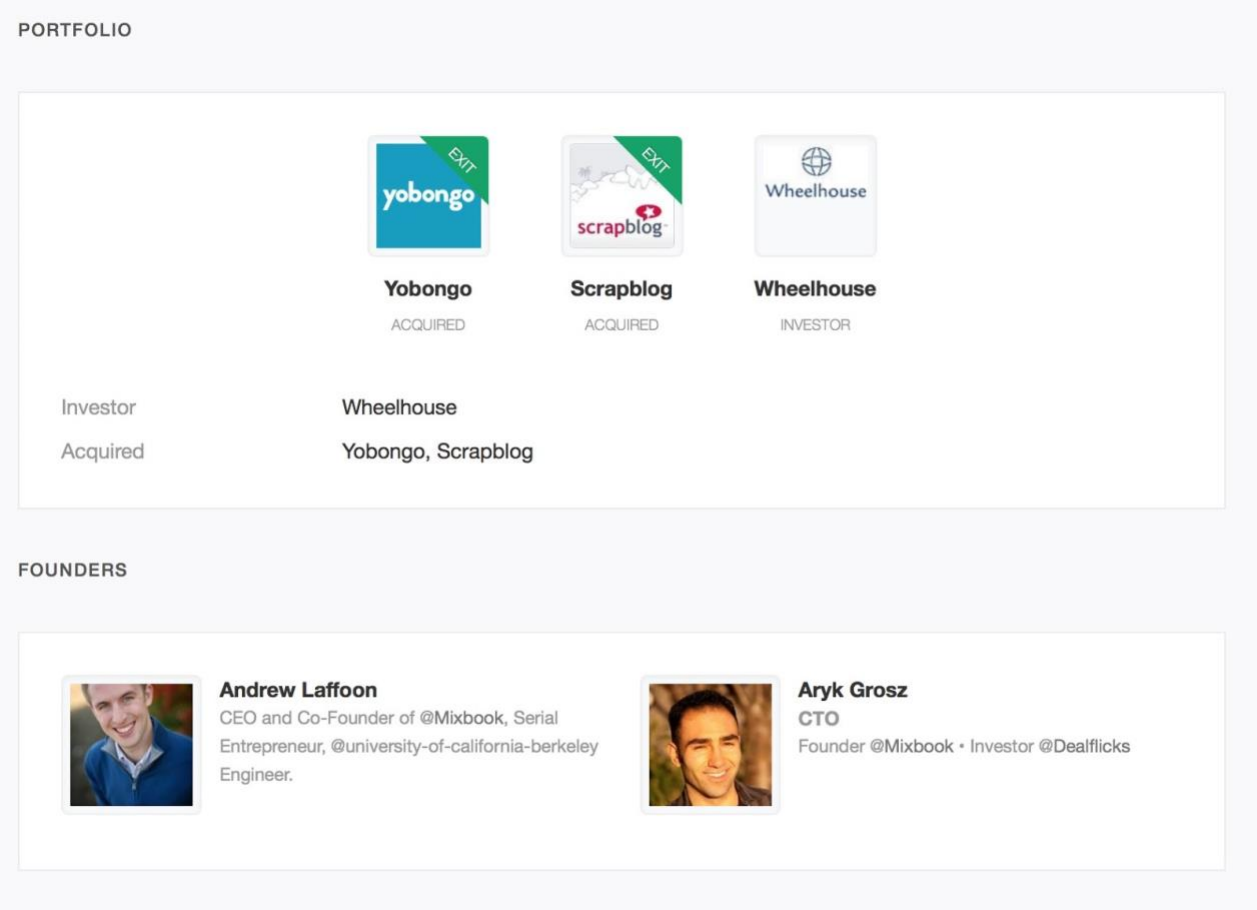


Exhibit 2 Current Website

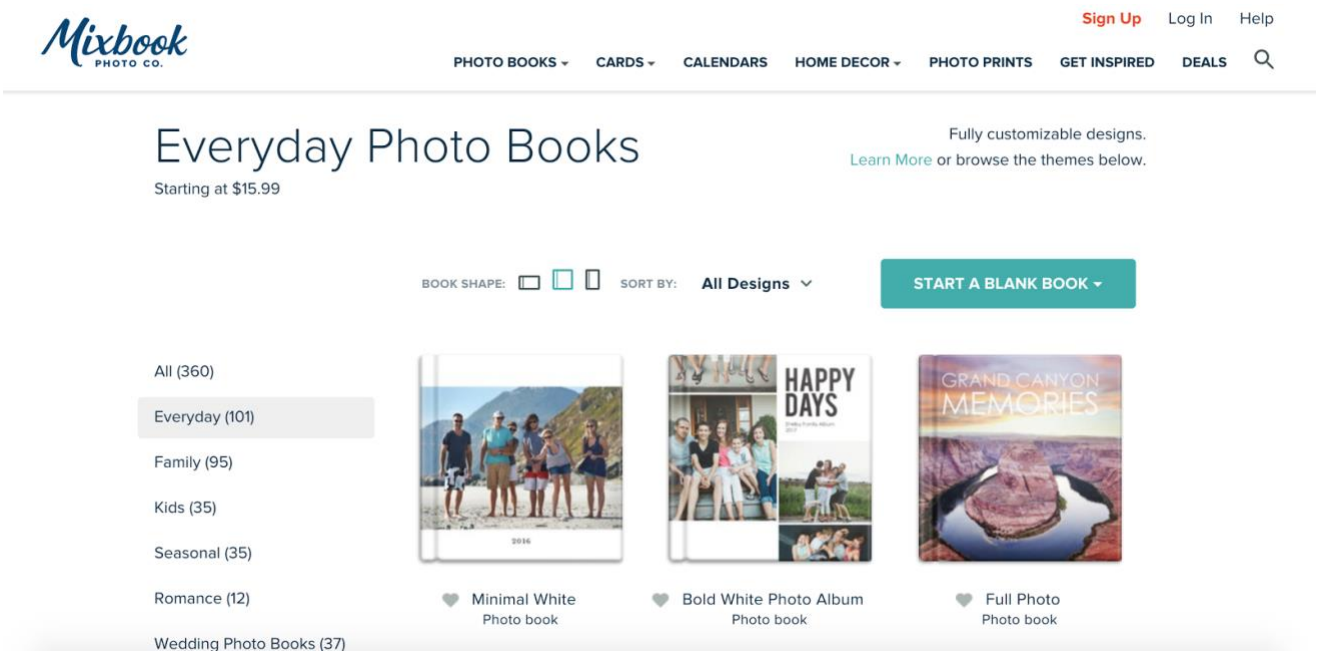


Exhibit 3 Funding Information

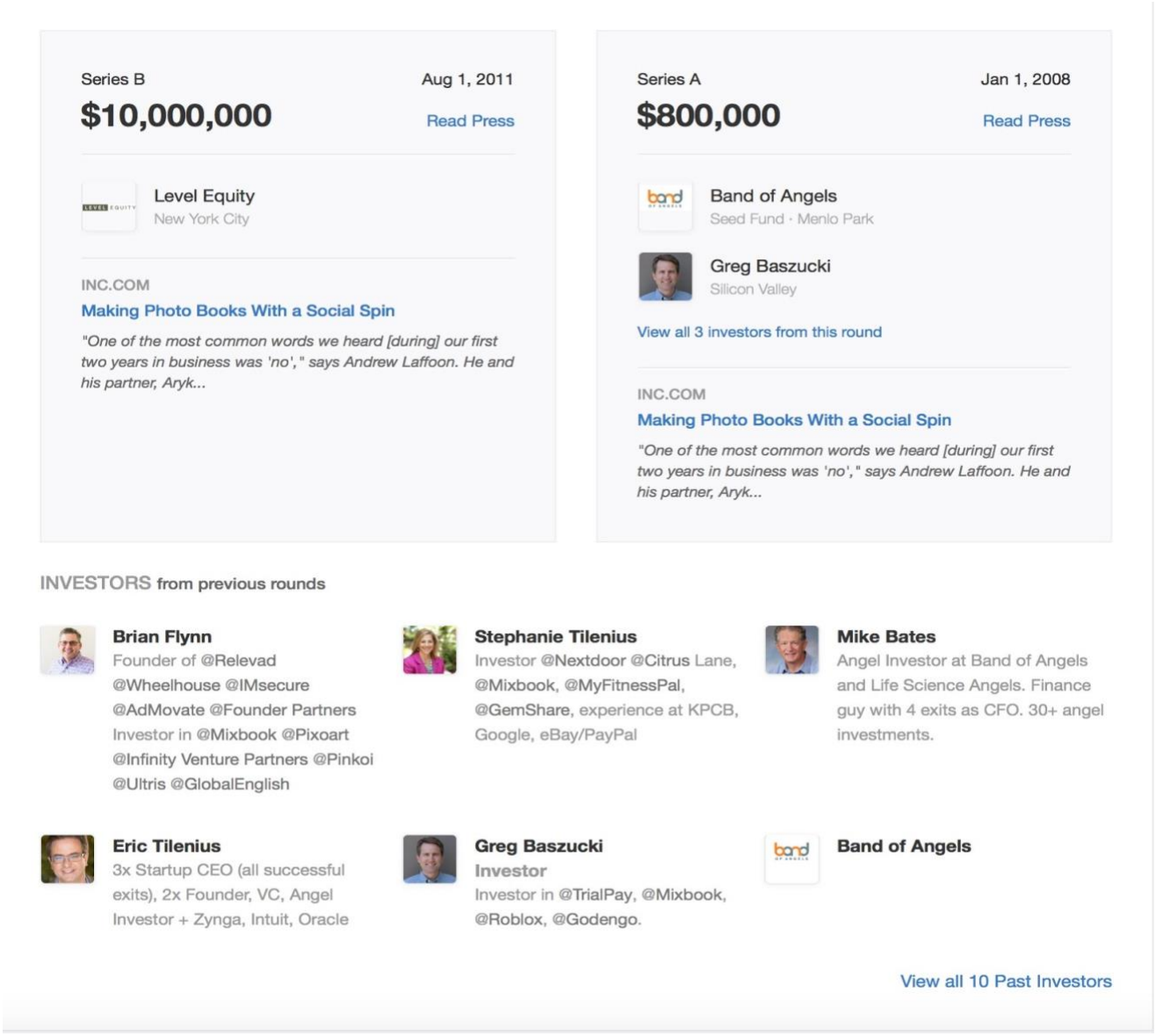


Exhibit 4 Forbes Profile

Mixbook on Forbes Lists

#43 America's Most Promising Companies (2013)

#43 Mixbook

Revenue As of February 2013

$25.1 Million

Industry	**Retailing**
Founded	**2006**
CEO	**Andrew Laffoon**
Website	**http://www.mixbook.com**
Employees	**60**
Founders	**Andrew Laffoon, Aryk Grosz**
Fiscal Year End	**Dec 31, 2012**
Headquarters	**Palo Alto, California**

A website and mobile application for creating photo books, cards and calendars. Customers use Mixbook's design software for free, but pay for print services. Prices range from $6.99 for mini photo albums to $54.99 for hardcover coffee table books. Founders Andrew Laffoon and Aryk Gosz began the company after winning a business competition as undergraduates at UC Berkeley in 2005.

Exhibit 5 News Article on Andrew Laffoon

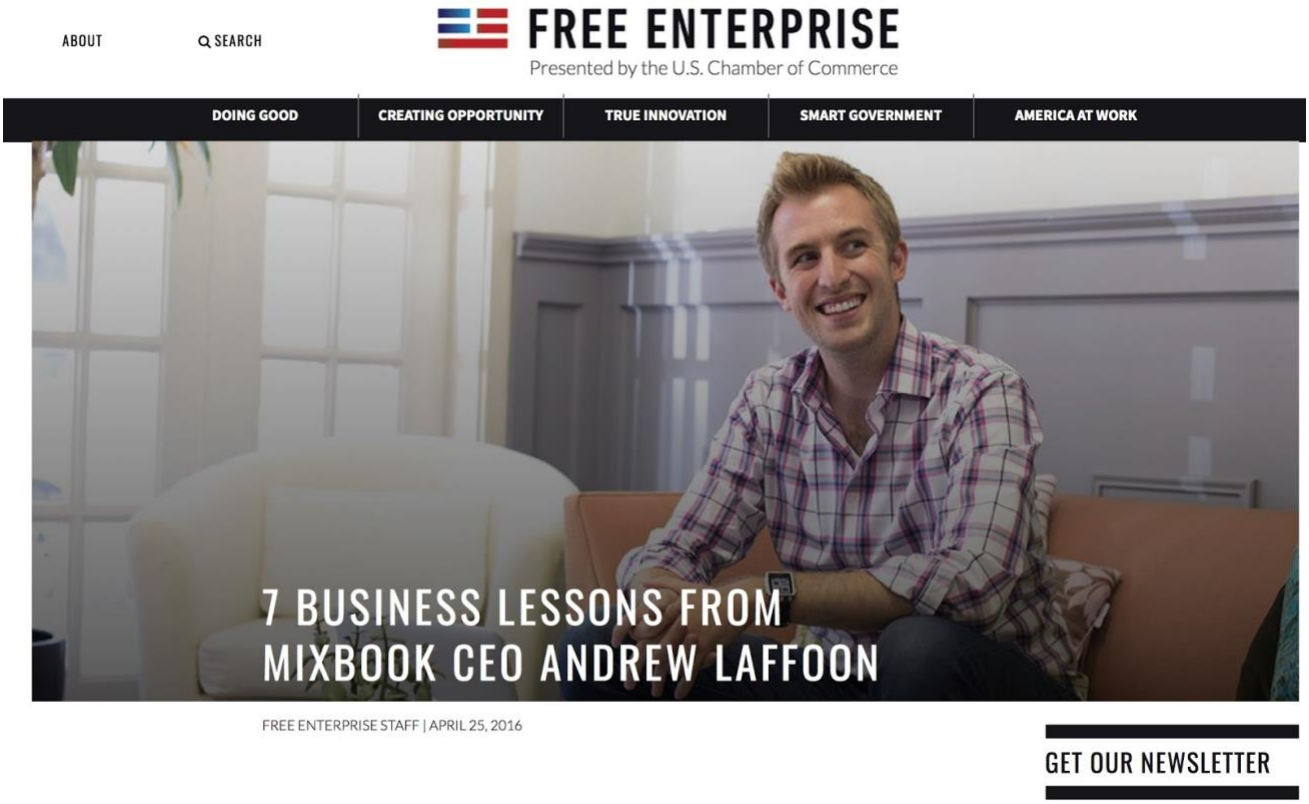


Exhibit 6 Mixbook's Old Logo

Exhibit 7 Mixbook's New Logo

Exhibit 8 The Sutardja Center for Entrepreneurship and Technology

Berkeley Leadership Case Series

20-180-005

January 4, 2018

David Chan's Dream Team

David Chan stood at the window of his second story office, tapping his fingers rhythmically against the windowpane as he watched the moist fall leaves dance in the wind. He had founded his first company Playtime just six months prior and already his goal of integrating remote control technology and a gripping story into smart toys was clearly within sight. It was a vision over 15 years in the making, but the speed with which he had arrived at this critical juncture for Playtime nonetheless caught him by surprise.

Chan felt that time was of the essence in executing his vision. He had built a broad network during his long tenure as an online gaming product manager at Electronic Arts. A network that was now rumbling about Disney developing a smart toy product quite like his own. While Chan had built a significant reputation in the online gaming community for forming strong teams that deliver quality products, he was aware of the formidable resources that a company the size of Disney could bring to bear.

As the rain pelted against the window, Chan barely heard his business partner and co-founder, Susan Radcliffe, enter the room. From her time with Chan making critical design decisions on a number of Electronic Arts projects, she knew that pensive look on Chan's face all too well. Only this time the stakes were much higher – Playtime was their company.

Radcliffe had been the creative genius behind much of their work at Electronic Arts and was concerned that the story behind the Playtime product had not been sufficiently fleshed out to be a strong draw for their primary target market, children and "tweens" (10-12 years old). If Radcliffe had just one more month, she was sure she could craft a truly compelling narrative. Chan had heard this argument from Radcliffe before, and her intuition in these matters was one of the key reasons he brought her on as a co-founder.

If the pressures from his partner Radcliffe and a potential strong competitor in Disney were not enough, finances were another consideration. Chan was proud of his ability to economize and

This case was prepared in the Sutardja Center for Entrepreneurship & Technology by lecturer Stephen Torres, editors Thomas Ferry and Mudit Goyal, and case team Varun Agarwal, Anthony Blair, Gwynevere Hunger, Faraz Kahen, and Keith Sollers prepared this case. It was reviewed and approved prior to publication by a company designate. Funding for the development of this case was provided by the University of California, Berkeley and not by the company. Berkeley Engineering cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

run a low-cost operation. Despite this, there was only so much he could do. Based on his estimations Playtime had a short runway of only about 3 months of cash left to fund operations. Playtime had a substantial number of pre-orders, yet any unanticipated delays in shipping the product could lead to Playtime's demise. Chan had leveraged his network and gauged some strong interest among a few angel investors, but he wasn't sure if he had enough time to get those investors engaged if the need presented itself. He had been reluctant to accept external funding in the past out of concern that he would lose control of his vision. Chan didn't see that fear abating anytime soon, even with these well-known potential investors.

Chan was close to achieving his vision with an interactive toy robot he had patented long ago as part of an engineering project in college, a project that ended in failure. This time, Chan felt he had the right team and that all the pieces for realizing his vision had finally fallen into place. If he failed this time, how many more opportunities would he have to realize his dream?

Early Life

David Chan was born in Hong Kong during the manufacturing revolution of the 1980's. Chan's father ran a consumer products manufacturing factory that produced a variety of goods, including umbrellas, electronics plastic flowers, novelty items, and toys. After spending time in the factory making toys, he became fascinated with toys and games, understanding the physical process that brought toys to life. He became very critical of toys in toy stores, always analyzing their manufacturing methods and flaws.

Chan left Hong Kong in the summer of 1989 to attend the Peddie School, a boarding school in New Jersey. The school promoted work, perseverance, and integrity, as highlighted by the school motto: "When we finish our labors, we begin them anew." Chan was active in sports there, playing varsity football and lacrosse, and he described his boarding school experience as "similar to the movie 'Dead Poets Society'."[1] When the time came to apply to university, Chan felt restless and desired a change of venue.

As a first-generation college student, Chan received little guidance from his family on selecting a college. He whittled down his choices to the University of California, Berkeley and the University of Southern California. He ultimately decided on Berkeley's Industrial Engineering and Operations Research (IEOR) program given its proximity to San Francisco and the Bay Area.

College Years

Chan matriculated at Berkeley in the fall of 1992. During his time at the university, Chan was tired of taking "the same old… IEOR classes"[1] so he decided to take a technology entrepreneurship course, Engineering 110 (E110), to spice things up. The course provided insight into the entrepreneurial process, customer discovery processes, market research, funding options, entrepreneurial finance and the creation of materials for a business plan. Unlike all the other courses Chan had taken at Berkeley which mainly allowed him to work individually or with other IEOR students, E110 gave Chan the opportunity to work with students of different backgrounds. In the process, he met many foreign students with varied majors outside of IEOR.

At the time, educational technology software grew as a market segment, targeted toward young children. Games like Reader Rabbit, featured a variety of simple games designed to teach schoolchildren basic reading and spelling skills. According to a survey of school priorities conducted by the Northwest Regional Laboratory for Research and Development in 1995, education technology was one of the six top issues in schools:

> "Educational technology is increasingly available in homes and community settings. A study by the Software Publishers Association (Heller Report, 1996 as cited in "CD-ROM software," 1996) reported home sales of education-oriented CD-ROMs increased 136% during the first half of 1995. Another study reported that nearly one half of all American households own a computer, and 17% of those who do not already own one plan to buy a computer in 1996."[2]

Given this trend, the principle assignment of E110 was to create an educational technology product.

Chan struggled to come up with an idea for the class project. Pondering the question in his apartment unit, he turned on the TV and saw a commercial for a new computer game for children. He stared at the TV screen with disappointment. Chan felt this overwhelming urge to set those characters free from that very impersonal monitor. The focus of his class project became creating a physical smart toy that controls the character on the computer screen.

Chan knew for his smart toy to be successful it had to keep children continuously engaged. He created a prototype with a teddy bear and a microphone that transmitted signals to a computer. The character in the game moved forward when the child correctly said the word "apple"", for example. In spite of Chan's enthusiasm, the project ultimately failed due to a lack of technical expertise on the team to pull it off.

Gap Year

After finishing E110 at Berkeley, Chan decided to take a year off in 1995 to work on several projects. He convinced the College of Engineering to let him do an internship under E110's instructors, the Dickinson brothers. Throughout his internship, he did two things in parallel: continued to pursue the robotics project and started a karaoke studio.

To pursue his dreams of increasing interaction between customers, mainly young children and their content, Chan came up with the patent for an interactive computer controlled doll, Chan's timing was prescient – the patent was issued at the beginning of the Dot-com boom and has been widely cited by such giants in the toy industry as Sony and Mattel (Exhibits 1 and 2). The patent pertained to personal computers and interactive toys and, more particularly, to a system in which a three-dimensional articulating doll interacts with a person operating a computer. His goal for this project was to provide a new and improved system in which a person interacts with a three-dimensional animated doll rather than just interacting with a character on a screen. Chan wanted continuous interaction for a richer experience.

In addition to this project, together with a college roommate, Chan purchased a karaoke studio in Oakland that had gone bankrupt. While they saved greatly on the purchase price, the studio was in an impoverished part of Oakland. Chan and his roommate took on this risk as they were able to identify a niche market, under-21 undergraduate college students from Berkeley who weren't permitted to enter the karaoke bars prevalent at the time. Their karaoke studio offered an affordable yet quality experience for those under 21 to have a fun night out singing without needing to serve alcohol.

So Chan began building his first business experience working in the niche sector of "location-based entertainment." Close to many different Bay Area colleges, Chan spent numerous hours marketing on college campuses. He noted how this karaoke marketing was able to teach him product-market fit in which their target customer base led directly to the karaoke studio

business model. Pricing each room at $15/hour allowed Chan make money on his first entrepreneurial gig.

The success of the karaoke business did not come without its own challenges from its location and clientele. Chan had to overcome obstacles of customers fighting, at times with gunfire involved. On the upside, Chan didn't need a gun held to his head to recognize his future wife when she entered the karaoke studio one day.

After his educational hiatus, he went back to Berkeley to finish his degree and graduated with a Bachelor of Science with Honors in IEOR in 1997, becoming the first person in his family to graduate from college.

Chan next enrolled in and obtained his Master's Degree in Industrial Engineering and Engineering Management from Stanford University in 1998.

Making His Mark

After leaving Stanford, Chan served as a product manager for several Dot-com companies from 1998-2002 including AOL, Yahoo, and REALTOR.com, before joining Electronic Arts in June 2003. As an online game product leader at Electronic Arts, Chan was instrumental in transitioning Electronic Arts from a business-to-business to a direct-to-consumer model.

Chan led a number of social community gaming efforts, including several generations of The Sims life simulation game, where children in particular were enabled to design and share their creations with other players.[3]

Chan also developed basketball and soccer multiplayer online games, where he learned and marketed the free-to-play business model to Electronic Arts consumers. Part of this work included the use of social interactivity tools such as matchmaking, buddy lists, badges and live sports data feeds.

Chan held the distinction of live producing Electronic Arts' biggest budget project "Star Wars: The Old Republic", a 3-year project which at launch in December 2011 broke the industry record for massively multiplayer online role-playing games (MMORPG) at the time, reaching a million subscribers only a week later, also the fastest growth in MMORPG history.[4] "Star Wars" had rich character development with several expansion packs as well as spinoffs into other media such as novels and comic books.[5]

Playtime

Chan met Susan Radcliffe during his time at Electronic Arts, someone whose artistry and craftsmanship he felt complimented his more technical background. Radcliffe was considered a world-renowned artist in the gaming community, having won several Shorty Awards for Best in Gaming during her stint at Electronic Arts. Disney, among other companies, had tried in vain to poach Radcliffe from Electronic Arts to help jumpstart its own smart toy initiative. Instead, Radcliffe opted to leave Electronic Arts in 2012 with Chan to found Playtime and at long last realize Chan's "dream from the back in the robotic toy project in Berkeley…of freeing these characters from this trap, this prison, called a computer monitor or tablet."[1]

Playtime combined the physical and virtual worlds of play. With Playtime, Chan was able to launch a whole new cast of characters with a great storyline, using his smart toys. Early on, Chan realized that building intellectual property was a capital-intensive proposition. Playtime remained a "scrappy" company, keeping costs to a minimum to support intellectual property

development. Additionally, Chan chose to focus Playtime's initial smart toy line on the tablet technology space, a platform commonly used by children for education purposes.

Even with the acute focus on tablets, one aspect persisted to dog Chan and Radcliffe, that of distribution. Big players such as Disney had the lion's share of shelf space in physical stores, while Chan's chosen distributor possessed just a small fraction of that space. Ninety percent of Playtime's preorders were to be fulfilled in-store, with the remaining ten percent fulfilled online via Amazon, so distribution regarding initial launch was not a concern.

However, as word of mouth spread after the initial launch of Playtime's product, the challenge of continually exposing children (and their parents) to the physical toys on the shelf seemed daunting. If Playtime could even get a small foothold, though, Chan felt that Radcliffe's reputation along with the quality of their story could still result in a viral product. In particular, Chan felt he had found the "sweet spot", a unique niche of smart toy that intersected the three key areas that needed to be addressed (Exhibit 3). Chan hoped that that sweet spot, combined with the trending increase in online sales, would mitigate the risk of limited shelf space over time, as the story and demand evolved (Exhibit 4).

Playtime's team was very small and close knit, consisting of the two co-founders along with three young engineers to handle the technical leg work. Chan felt it was important to balance the stronger management and technical background of the founders with younger employees that possessed passion for his vision.

The Smart Toy Market

Chan started Playtime during a boom in the smart toy market.

The notion of a toy that you could communicate or interact beyond the physical sense started in the 1960s. Mattel, the toy giant, came out with a product line of dolls with strings you could pull to make them talk. Although these rudimentary toys aren't considered high-tech they were important to the development of smart toys.

The smart toy industry took a huge step forward with the invention of the microprocessor in the 1970s. This allowed toys to contain much more computing power and complex computing systems. Initial microprocessor toys were guessing or spelling games, followed by more physical interactive smart toys such as the Furby, iDog, and AIBO. At the end of 1999, the smart toy segment accounted for 2.5% of the $23 billion toy market. Current toys have built upon the rudimental toys such as iDog and Furby, and have started to incorporate current computing and artificial intelligence technology to make toys seem like true lifelike, sentient beings.

Smart toys were quickly advanced by exponential technology advancement in the 2000s. As technology advanced, prices of electronic components dropped, and availability increased, the smart toy market started to boom. These high-tech toys became affordable and very attainable for a very wide market.

In 2012, the year Playtime was founded, the smart toy market was worth less than $2 billion. As large players entered the space, the market value was forecast for strong growth, with an estimated market size of $10 billion (8.38 billion euro) by 2020 (Exhibit 5).

The Decision

After mulling over the feasibility of sustaining his business over the next few months in his office, Chan considered his options: keep going forward with the original release schedule or

put more time into Radcliffe's story development, at the risk of either running out of cash or relinquishing control to external financiers.

Continuing with Playtime would put the co-founders' livelihoods on the line. At the time immersive gaming was exactly what customers were interested in and Disney's rumored product could be extremely successful, mostly due to Disney's ability to draw from its rich catalogue of motion pictures. Without a long history on the market, Chan would have to first engage the right business and distribution partner to handle the marketing for the product.

On the other hand, delaying the release for any period of time could potentially cause him to miss out on one of the biggest shifts in the immersive entertainment industry, putting his dream out of reach, possibly for good. Realizing that he was onto something with Playtime made it that much more difficult to walk away.

Chan nodded in greeting to Radcliffe as she entered his office, observing the hopeful smile splayed across her face. Then he turned back toward the window, laughing to himself that perhaps those dancing leaves would give him some sign of what to do. But the time for laughter had passed; the most serious decision of his life awaited.

Exhibit 1:

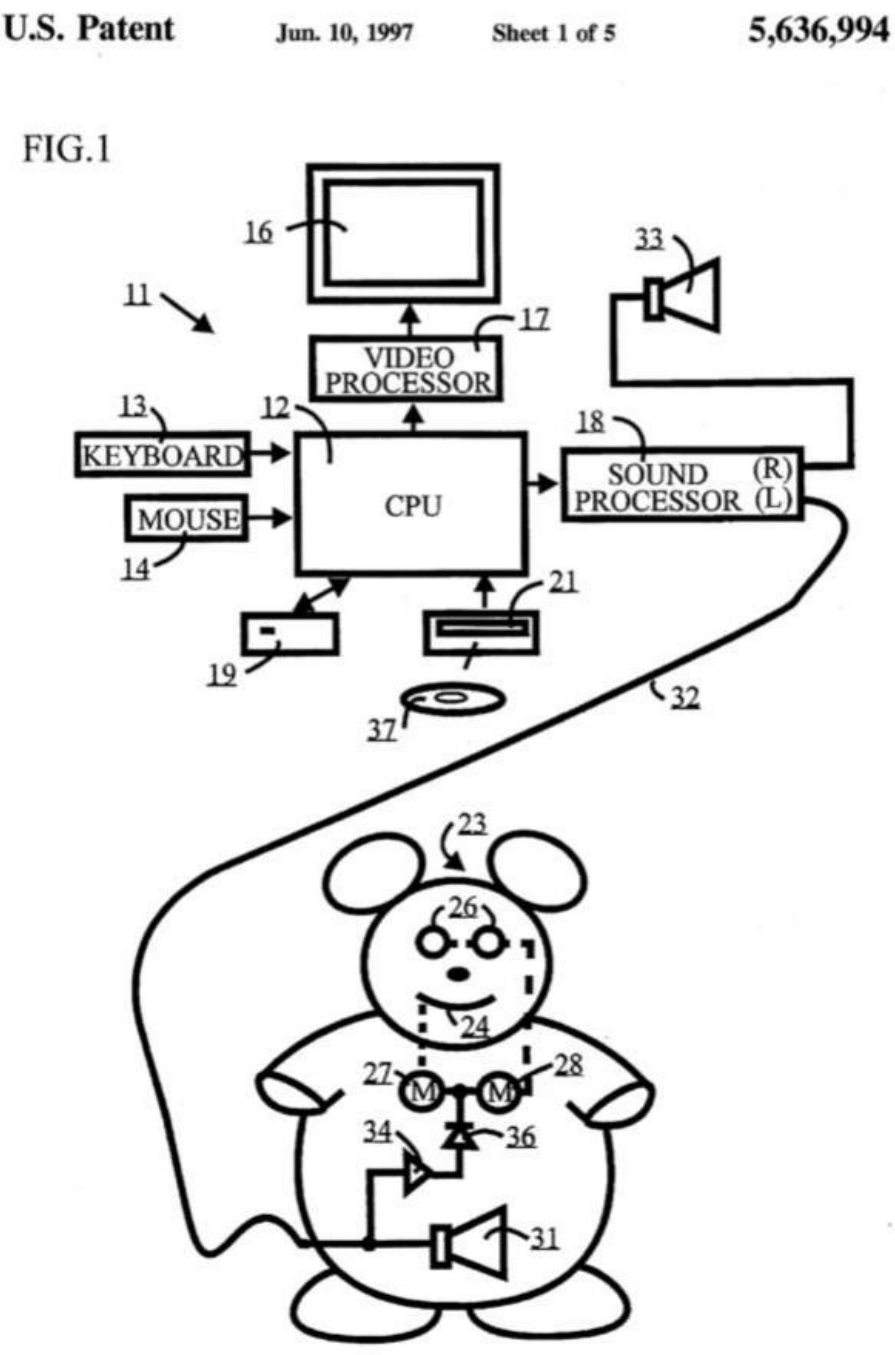


FIG.2

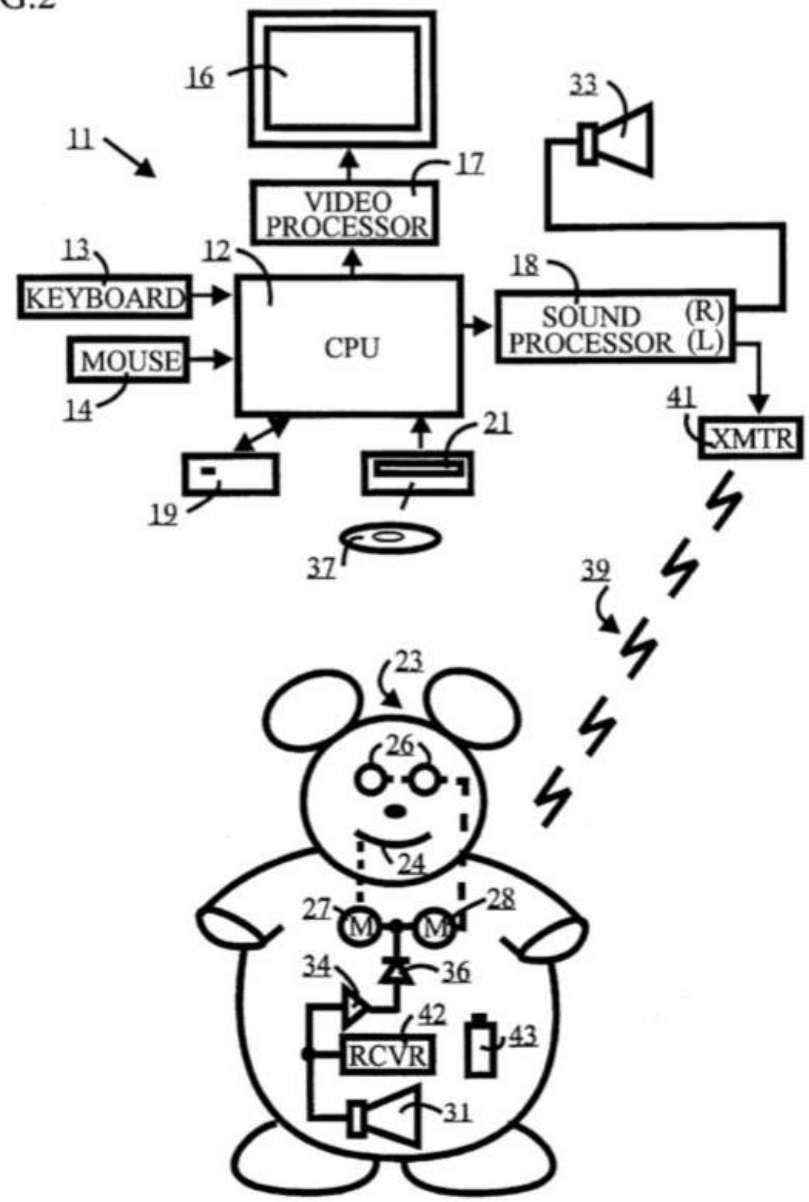


FIG.3

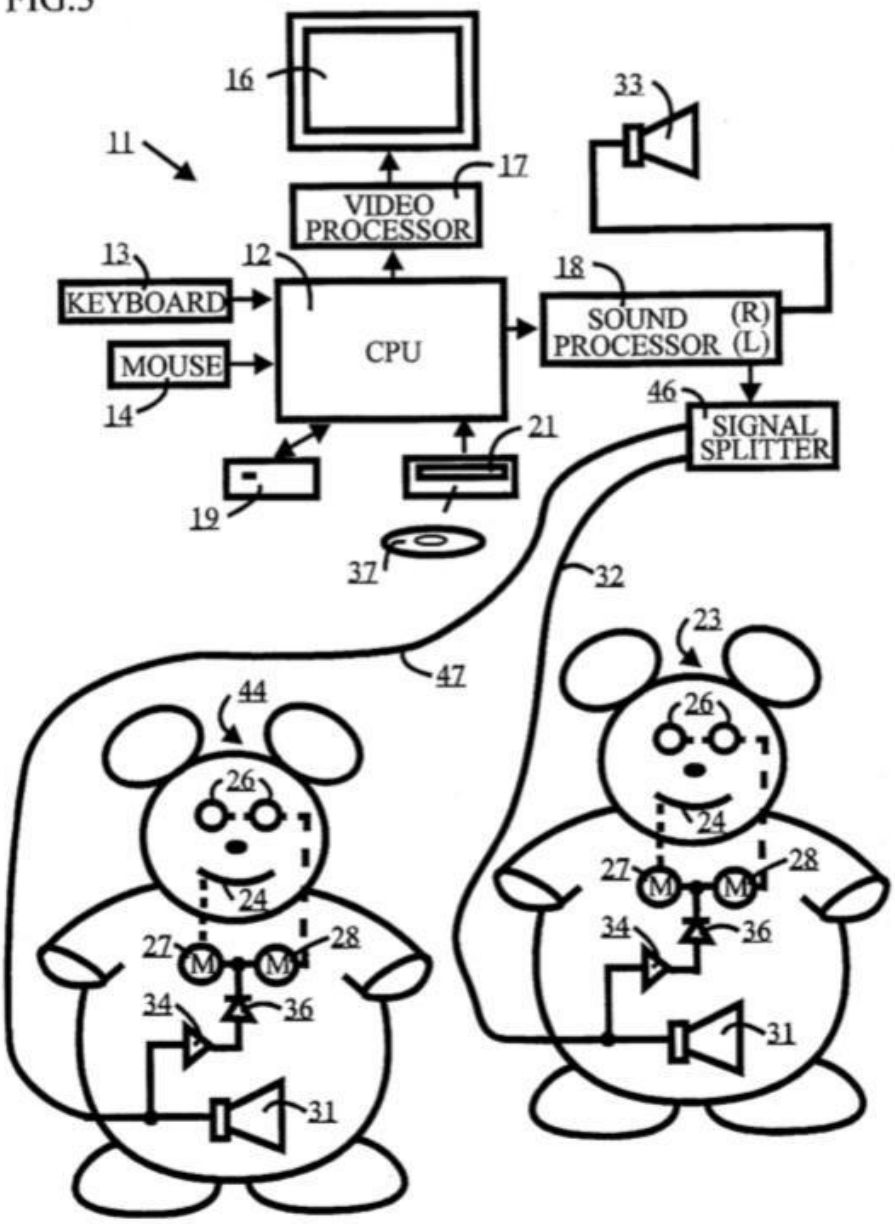


FIG.4

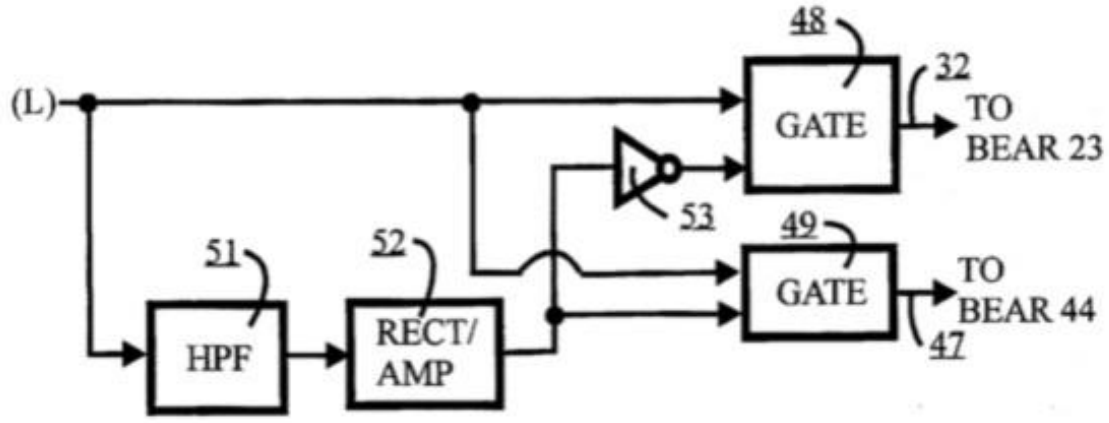


FIG.5

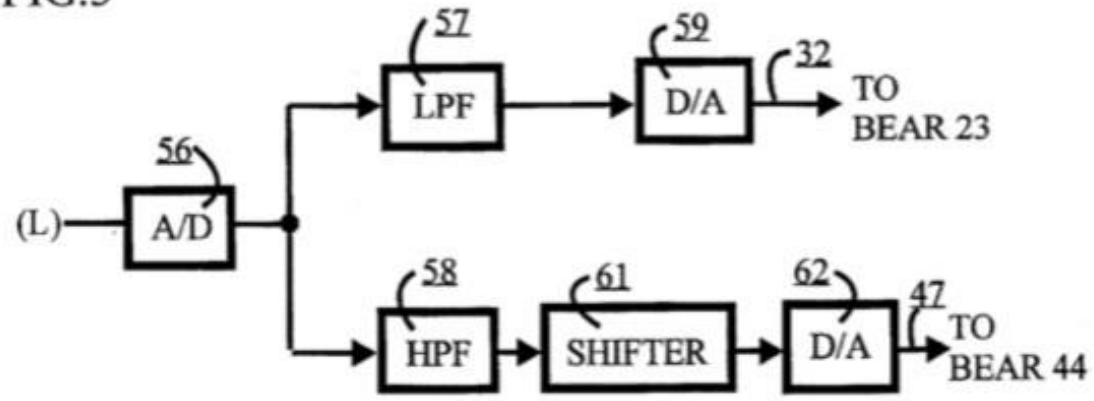
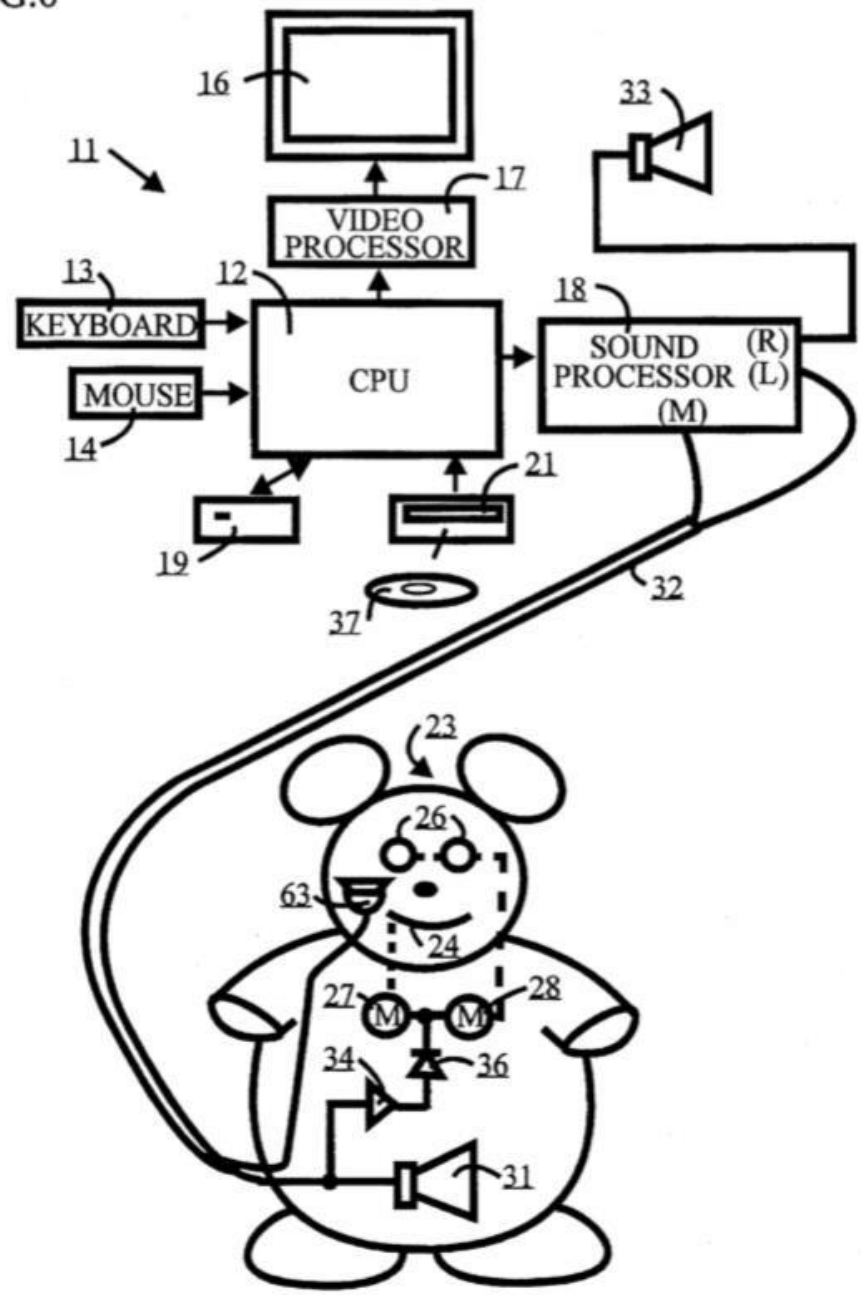
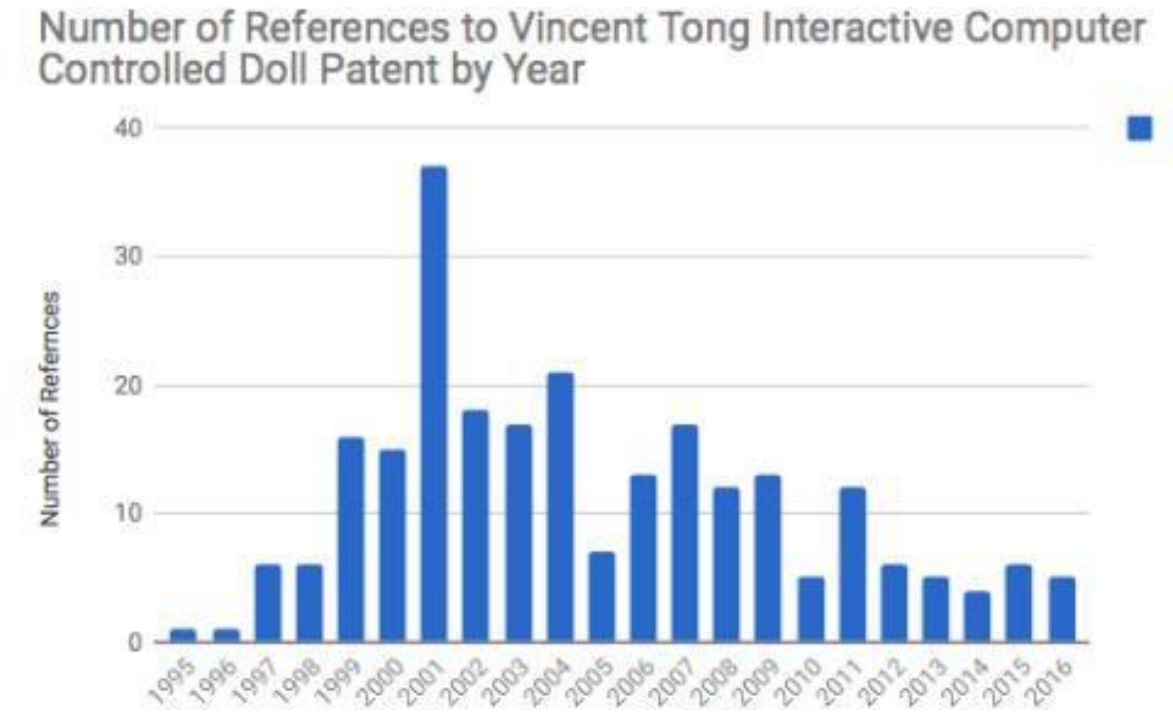


FIG.6



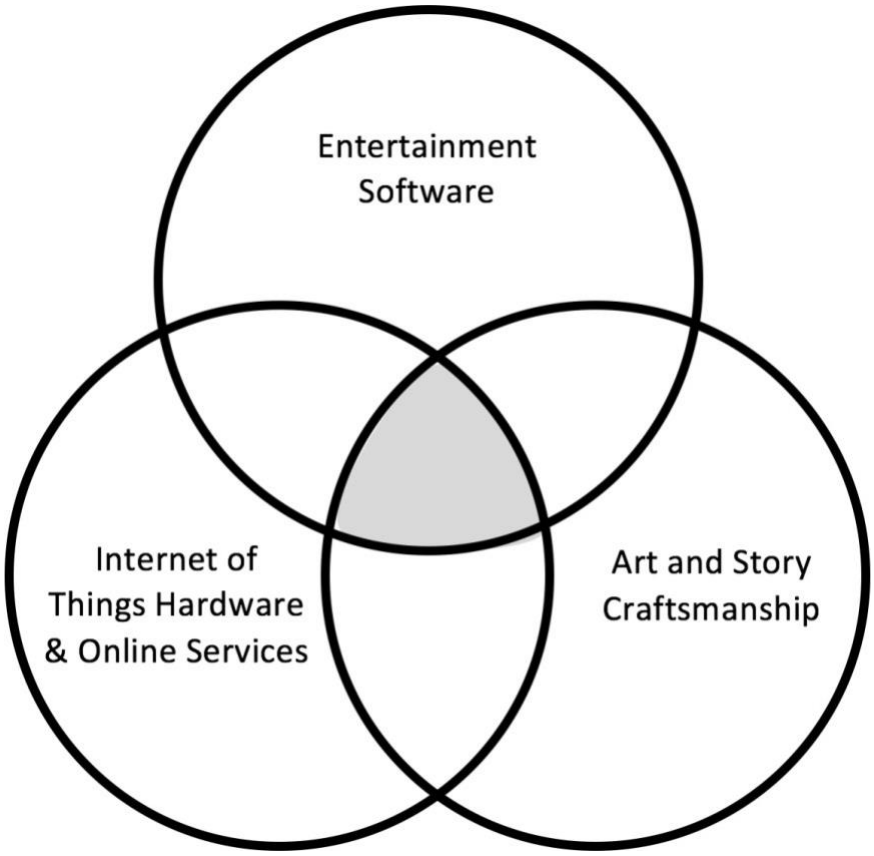
Source: Compiled by Case Researcher with data from the patent financial reports

Exhibit 2:



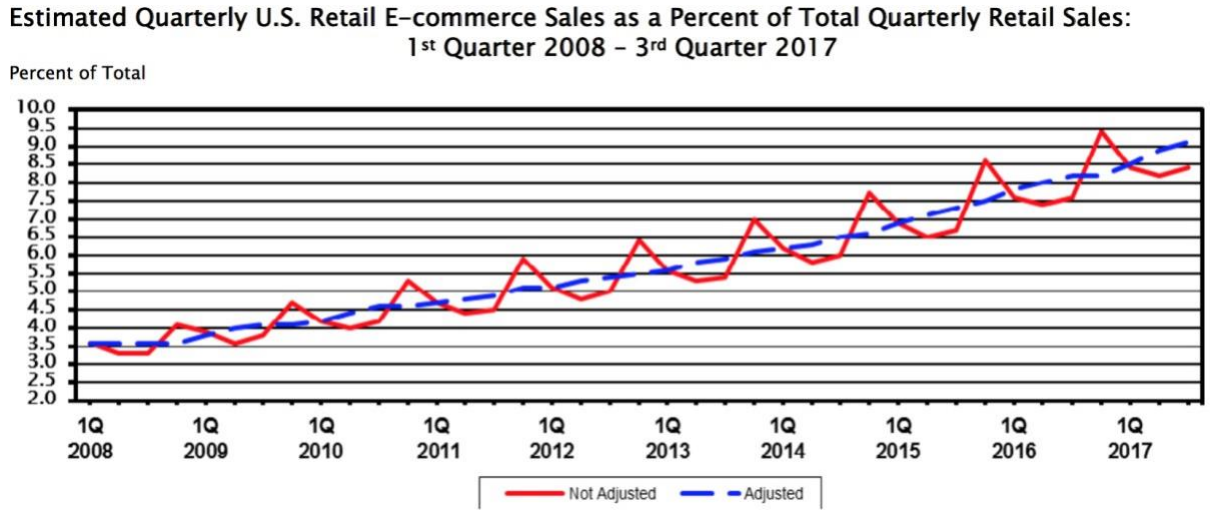
Source: Compiled by Case Researcher with data from the patent financial reports

Exhibit 3:



Source: David Chan Interview

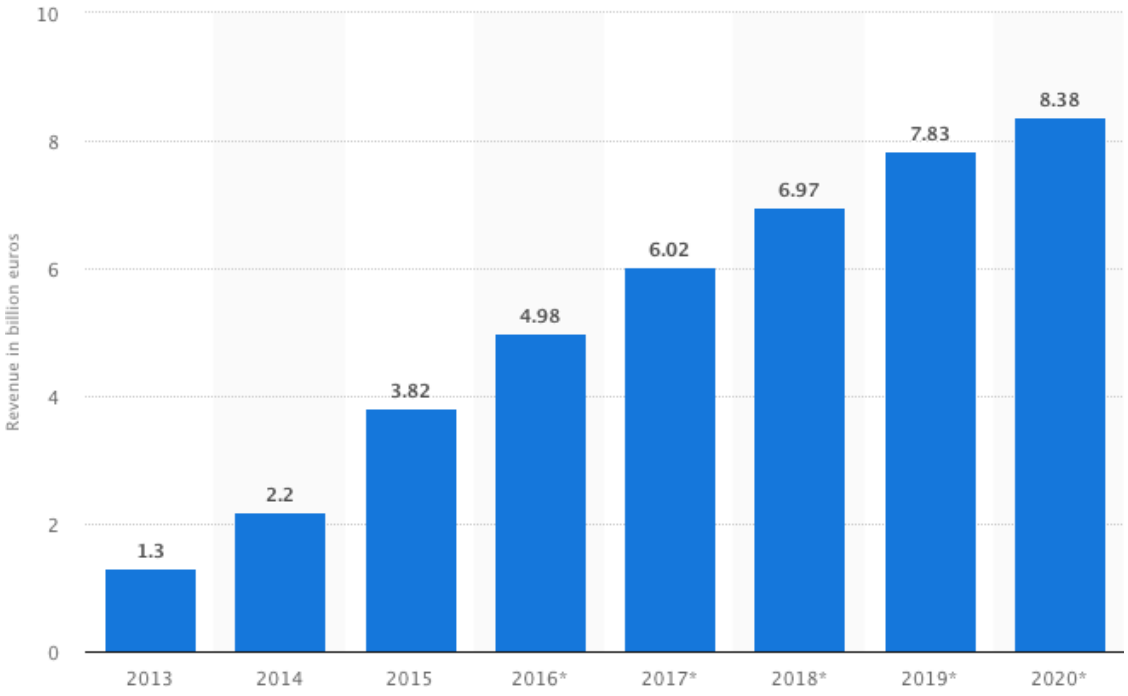
Exhibit 4:



Source: https://www.census.gov/retail/mrts/www/data/pdf/ec_current.pdf

Exhibit 5:

Forecasted Smart Toy Sales Growth: 2013-2020 (in billion euros)



Source: https://www.statista.com/statistics/320941/smart-toys-revenue/

End Notes

[1] David Chan Interview, November 14, 2017

[2] Plotnick, Eric. "Trends in Educational Technology 1995. ERIC Digest." Clearinghouse on Assessment and Evaluation, ERIC Clearinghouse on Information and Technology Syracuse NY., 30 Nov. 1995, ericae.net/edo/ed398861.htm.

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[4] Waugh, Rob. "Record-Breaking Star Wars Epic Is First to Beat World Of Warcraft at Its Own Game." Daily Mail Online, Associated Newspapers, 28 Dec. 2011, www.dailymail.co.uk/sciencetech/article-2079294/Record-breaking-Star-Wars-epic-beat-World-Warcraft-game.html.

[5] "Star Wars: The Old Republic." Wikipedia, Wikimedia Foundation, 26 Nov. 2017, en.wikipedia.org/wiki/Star_Wars:_The_Old_Republic.