

The Little *Book*

of

BIG

Companies

Appalachian State University

The Little Book of Big Companies

by

CS 3100 Junior Seminar

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Prologue

This book is the product of the fall 2013 CS 3100 Junior Seminar class. Each chapter of the book is written by a different student in the class, and contains information about a company that the student investigated. The selected companies vary in size, in location, in what they produce, and in how well-known they are. We have grouped them into gaming companies, companies involved in producing other types of software or hardware, and companies that didn't fit into one of those other two categories. Students searched for information that would be of particular interest to prospective employees of the companies — workplace environments, types of available jobs, and starting salaries, for example. Together the class members have produced this book so they can share the information they discovered. Class members hope that this work is of benefit to you in your search for a job after graduation.

Part I

Gaming Companies

Chapter 1

Bethesda

Jacob Pollard

1.1 Overview

Bethesda Softworks is an American videogame publisher based in Rockville, Maryland. A subsidiary of Zenimax Media, Bethesda Softworks has been a developer and publisher since 1986 when it was founded by Christopher Weaver.

1.2 History

1.2.1 The Beginning

Bethesda Softworks was founded in Bethesda, Maryland, and moved to Rockville, Maryland, in 1990. In 1999, Christopher Weaver and Robert Altman founded Zenimax Media, Inc [4]. Weaver's vision was to use Bethesda Softworks as a hybrid-media company which would create cross-media properties for a diverse range of different platforms. Weaver brought Altman on board as CEO, contributing his stock in Bethesda Softworks so that the new shell company, named Zenimax Media, would be able to obtain funding. Since then Zenimax Media has obtained many subsidiaries, including id Software, Bethesda Game Studios, Arkane Studios, Tango Gameworks, MachineGames, and Zenimax Online studios [6].

1.2.2 Game History

Bethesda has a long history of PC and console games, including the first physics based sports game (Gridiron!) in 1986 for the Atari ST. "From 1986 to 1992 the company developed a number of games, including several Terminator titles and many sports

simulator games. In 1993 Bethesda released the first game in what is likely its most recognizable franchise, *The Elder Scrolls: Arena*. *Arena* is a first-person action role playing game (RPG) that puts a lot of focus on side quests and features an open ended world called, Tamriel. Company founder Christopher Weaver is recognized as the principal force behind the creation of the game. *The Elder Scrolls: Arena* was developed for the computer and released via CD-ROM and Floppy disc. Bethesda released its second title in *The Elder Scrolls* series in 1996, called *The Elder Scrolls II: Daggerfall*, for the computer [7].

1.2.3 Zenimax Acquisition

In 1999, Bethesda Softworks was acquired by ZeniMax Media Inc., a company founded by Bethesda Softworks founder, Christopher Weaver and current ZeniMax Media Inc [7]. Since Bethesda was taken over by Zenimax, the company has produced many award winning games including *The Elder Scrolls III: Tribunal*, *The Elder Scrolls IV: Oblivion*, *Skyrim*, and *Fallout 3*.

1.3 Company Environment

1.3.1 Overview

In order to apply for a career at Bethesda, job seekers must go to the Zenimax careers website. Once there, the screen will be bombarded with job offers showing the large spectrum of professionals employed. Beginning with administration and ending with sales, the company employees will be immersed in different fields of expertise, assuring that they can find someone with the answer to their problem.

1.3.2 Work Environment

Bethesda Softworks and Bethesda Game Studios represent the publishing and development arms of the brand, employing a staff of more than 100 people in areas like art, design, marketing, sales, and IT. The administrative offices keep it business casual, but in the studio shorts and flip-flops are the norm. The company has spent two decades cultivating its award-winning reputation, and there are no slackers here. The game industry is motivated by deadlines like any other business; when the pressure is on, the hours can be long. It isn't uncommon to find a programmer passed out on the office futon at 10 p.m. To hack it at Bethesda you must be truly passionate and dedicated to your work. To keep that staff healthy and happy, there's an on-site gym, theater, caf, and fully stocked kitchen. Regular games nights and other activities help foster a family bond [1]. The offices are situated in a large space within a nondescript professional complex. The employees here are allowed to decorate their workspaces as they

please, which would explain the desks with lava lamps and pop culture tchotchkes. This produces a vibe that is geeky, youthful, and fun. When an employee isn't working on software or designing a new 3D animation, they are encouraged to play the games they produce to help locate and resolve glitches. Alongside the stated benefits, the office also features an entertainment space that includes a theater, a lounge, a pool table, and various gaming consoles [8].

1.3.3 Salaries

Salaries at Bethesda seem to vary greatly. Network Operations Manager makes between \$101,000 and \$118,000 annually, while QA Tester makes 29,000-31,000 [2]. The average salary at the company is 43,000 [3].

1.3.4 Requirements - Programmers

The following are the suggested requirements for Programmers at Bethesda Softworks [5].

- B.Sc. in Computer Science and/or Mathematics
- Proficient with c and object-oriented programming
- Development experience in the games industry a plus.
- Development experience on game consoles (Xbox360/PS3) a plus
- Experience with DX9 2.0 or above level Shaders and HLSL a plus
- Ability to contribute innovative and original ideas towards all aspects of game production and development
- Strong communication and organizational skills
- Must work well under pressure and handle multiple tasks
- Passion for making GREAT games
- Experience playing previous Bethesda Games Studios games

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Chapter 2

Oculus VR

Joey Bennett

2.1 History

2.1.1 The Beginning

Oculus VR was founded by Palmer Luckey through a Kickstarter campaign. Luckey's vision was to create a virtual reality headset for immersive gaming. Gaming companies like Valve, Epic Games, and Unity supported Oculus VR from the start. With their support, and the support of all the Kickstarter backers, Oculus VR raised \$2.4 million. The goal of Oculus VR is to make "immersive virtual reality technology that's wearable and affordable." Before starting Oculus VR, Luckey was well known for having the largest collection of head-mounted displays in the world. He was a head-mounted display designer at the University of Southern California Institute for Creative Technologies. [4] Luckey's goal was to create a new head-mounted display for gamers because he was not satisfied with anything that was currently on the market. Many devices did not have a large enough radius of vision, so when looking through them, it still felt like looking at a faraway screen. Others had so much lag and latency when the display moved, that they were unusable for gaming.

2.1.2 Funding

Oculus VR had an extremely successful Kickstarter campaign. The campaign went from August 1, 2012 to September 1, 2012 with a goal of \$250,000. Within four hours, that goal was met, and within 36 hours, the campaign had already raised over \$1,000,000. Over the course of the one month Kickstarter campaign, Oculus raised \$2,437,429. [3]

2.1.3 Support

The successful Kickstarter campaign could not have happened without the support of major companies like Epic, Valve, and Unity. These three companies heavily supported Oculus, and urged other people and companies to do the same. John Carmack also heavily supported Oculus VR before he joined the Oculus team as Chief Technical Officer. He was one of the first supporters of Oculus, and urged many other big names in the business to take a look at it. Carmack is known for his innovations in 3D graphics. Carmack was also one of the co-founders of id Software, the company that made games like Wolfenstein 3D, Doom, and Quake. He is still working at id Software, but Oculus is now his priority. He recently said, “My time division is now Oculus over id over Armadillo [Aerospace]. Busy busy busy!” [6]

2.2 Products

2.2.1 Development Kit

As of right now, there are only a couple products Oculus offers since it is still a very new company. The main product is the Oculus Rift Development Kit. This is only meant for people trying to develop products to be compatible with the Oculus.

2.2.2 Other Products

There is also the Oculus Latency Tester to accurately measure latency of applications and games. [4] A consumer version of the Oculus Rift isn't available yet. With so few applications available now, there is not much use for one yet. Oculus VR is also still working on increasing the quality of the Oculus Rift before releasing a consumer version.

2.2.3 Third Party Products

There are only some games that are completely compatible and playable with the Oculus VR at this time. Valve's Half Life 2 and Team Fortress are two of the few games that are ready to play. Many other lesser known games like Museum of the Microstar and Tuscany Razer Hydra are also playable now. [1] There are hundreds of games and applications that are being developed that will be playable in the near future. The potential applications of the Oculus Rift are endless and go beyond just immersive gaming. An app called VR Cinema3D is being developed by Joo-Hyung Ahn at UX-Ground to be a virtual movie theater, with rows of seats and a big screen. It still has its share of bugs, but the picture looks stunning on the HD Oculus Rift. [1]

2.3 Reception

2.3.1 Praise

In 2012, the Oculus Rift was nominated Best Hardware of E3. In 2013, the new 1080p HD Oculus Rift prototype was shown off. This version had more than double the amount of visible pixels of the 720p version shown in 2012. This was a huge update to the previous version. With improved brightness, contrast, and color, this new HD version feels much more immersive. The 2013 E3 was also the first time that Oculus developers showcased their games with Oculus support. PC Gamer wrote, "The next generation of gaming hardware was indeed present at E3 this year, but it wasn't a console manufacturer that delivered it. Instead, it was Oculus VR." [2]

2.3.2 Critique

The Oculus Rift has received almost completely positive reviews. The only critique is that many people have experienced motion sickness when using the Oculus Rift. This is especially common in apps like a roller coaster simulator. The amount of people experiencing motion sickness has caused Oculus VR to make adjustments to fix this. Oculus VR's own CEO, Brendan Iribe, admitted to feeling sick after only two minutes in the first Oculus Rift model. Increasing the resolution and decreasing the latency in newer models will make motion sickness less common. [5]

2.4 Company

2.4.1 Jobs

Oculus VR is based in Irvine, California, near Disneyland and the California coast. A few benefits of working for Oculus are competitive salaries, great health care coverage, subsidized lunches, flexible hours, and top-of-the-line equipment. Each Oculus employee also receives their own Oculus Development Kit. There are job openings for many different software engineers. Software engineers looking to work at Oculus VR should be proficient in Unity, Unreal, kinematics, and Android. The hardware side is equally as important and also has many positions open. Electrical engineers, manufacturing test engineers, and embedded systems engineers are in demand. Oculus VR still needs people who do not necessarily have a background in computers. They also need people who could be administrative assistants, art directors, and financial analysts. These are all just a few of the many jobs that are still available at Oculus VR.

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Chapter 3

Riot Games

Nathan Mudford

3.1 Introduction

Riot Games, Inc. was founded in 2006 by Brandon Beck and Marc Merrill. It was meant to be a player-focused game development studio. In 2009 Riot Games released the only game it is currently known for, League of Legends. [2] The game has gained massive popularity, having 11.5 million monthly players and 4.2 million daily players in November 2012. It is played in the US, Australia, the Philippines, Singapore, Malaysia, Thailand, Canada, South Korea, Taiwan, China, Brazil, and most of Europe, the latest venture being in Russia in April 2013, when the Beta Test servers were launched there. The game has also joined the eSports arena, and will hold the next competition in the Staples Center after the last event sold out to an audience of 10,000 at the University of Southern California. In terms of growth, Riot Games has moved from the Santa-Monica company of about 100 employees at the release of League of Legends in 2009 to a current international company with about 1000 employees. It also made fourth on the list of Business Insiders 25 Top Tech Companies To Work For In 2013. [3]

3.2 Employee Salary

Riot Games pays its employees 10% higher than market average. One example is the Senior Web Developer position with Riot Games. The base salary is anywhere from \$66,000 to \$125,000, and bonuses start at \$3,000 per year after ten years of employment. The average amount gained from profit sharing is \$2,500. Other positions and salaries are Software Engineer from 83,000to114,000, Senior Software Engineer from 105,000to124,000, Game Engineer from 51,000to100,000, Systems Engineer from

115,000to130,000, Web Developer from 86,000to103,000, Associate Software Engineer from 62,000to110,000, and Engineering Manager from 170,000to187,000, etc. [4]

3.3 Company Positions

The following jobs are only a few of the jobs available for a computer science major. There are multiple web development positions, including positions pertaining to different mobile platforms and also different positions for different regions of the world, such as South America and Europe. There are about a dozen positions pertaining to Big Data, including Database Administrator, Software Engineer and Systems Engineer for Big Data, and Automaton Engineer. There are many positions under technical operations, such as Network Engineer, Information Security Engineer, System Engineer, and Web Producer. Platform Engineering also contains a few; Software Engineer in Java or Core, Platform architect, Database Administrator, and Engineering Manager. [3] The set of places a Rioter may work includes offices in Santa Monica, California; St. Louis, Missouri; Dublin, Ireland; Seoul, South Korea; Istanbul, Turkey; Moscow, Russia; Sao Paulo, Brazil; and Sydney, Australia. [3] The most popular skills according to payscale.com are, first, knowledge of Java, second, knowledge of HTML and JavaScript, and tied for third, leadership abilities and knowledge of PHP and HTML. [1]

3.4 Work Environment

The hours are said to be irregular. Computer programmers are usually allowed to make their own schedule due to the nature of the work. In regard to coworkers, the company is mostly younger adult males: men make up 85% of the full-time staff. Age-wise, 75% of the employees are under 34. [5] The offices are set up using open plans, which are supposed to better communication and creativity in companies. [3]

The culture is best described as fun-loving, and this is necessary for a game development company. Apparently presentations are littered with memes, and squirt guns are tolerated. There are also PC Bangs (Korean for rooms), a common attraction in South Korea where friends can get together and play games like Starcraft, Diablo, and World of Warcraft on high-powered computers for a low hourly fee. Games are taken seriously, and the phrase "just a game" is nigh taboo. The first day on the job starts with a playtest. Another tenet of Riot Games life is something like "Kick more ass, take less names," exemplifying the emphasis on action and new ideas over bureaucracy. [3]

There are monthly meetings where the employees get together and talk about new ideas and even just playing the game in general. There are also daily company playtests of the game, and there are also company-wide tournaments known as "Riot Rumbles." Board game nights or night pub crawls are organized on some weekends. There

are many events organized for employees to present what they have been working on to the company and also see what others are working on. There are also early screenings of some movies like *The Dark Knight Rises* and *The Avengers*. [3]

Regarding the approval level of Riot Games, 98% of employees look forward to going to work and do not consider it to be "just a job." 94% feel that they are being treated fairly regardless of their position and that management is approachable and easy to talk with. [5] On the down chance that you are one of the 2% that do not look forward to coming to work, Rioters work on a very flexible schedule. [3]

The benefits provided by Riot Games include a variety of subsidized medical, vision, and dental insurance plans, benefits coverage for domestic partners, a matching 401k, short term and long term disability insurance, life insurance, an on-campus gym, flexible hours, cheap dinners, annual all-company outings, an on-campus PC Bang, free snacks, tea and coffee, top-of-the-line computers and peripherals, weekly visits from masseuses, and early screenings of movies. And of course, the fully loaded League of Legends account.[3]

3.5 Conclusion

All considered, Riot Games is a pretty great place to work. 98% of the employees like working there, the work is interesting, and if you aren't playing games then you are at least programming parts of one. The company does extra things like putting on early showings of movies. The pay is higher than usual, and finally, there are locations all over the world.

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Chapter 4

Square Enix

Alyssa Tyler

4.1 Introduction

Square Enix is a multi billion-dollar company from Japan that is best known for its development and production of major video game series. Since its origin in 2003, it has acquired and created many subsidiaries outside of Japan, including groups in London and America. Square Enix specializes in game development and publishing, and its highest grossing products are series such as Final Fantasy and Dragon Quest. The company has produced such successful games that twenty-seven of them made it into Famitsu magazine's list of "Top 100 Games Ever".

4.2 Square Enix

4.2.1 History

The company formed in April of 2003 in Tokyo, Japan. It began as a merger between the two companies Square and the Enix. The majority of workers at the time came from Square and the president of Square transitioned to the president of the new corporation, while the president of Enix became its vice president. In 2008 the company became Square Enix Holdings.

4.2.2 Subsidiaries

After the merge, Square Enix Inc. acquired several other companies, expanding its capabilities into different markets. In 2005, the company announced its takeover of the Taito Corporation, a publishing company responsible for arcade hits Space Invaders

and Bubble Bobble. Several years later, Eidos Interactive became the newest subsidiary of Square Enix and was turned into Square Enix Europe, located in London, U.K.. Eidos productions include the popular games Tomb Raider, Hitman, Deus Ex, and Thief. Since Square Enix's formation, a subsidiary in North America has also opened, located in Los Angeles, California.

4.3 Output

4.3.1 Types of products

Although Square Enix is almost exclusively known for its major console/PC game series, their products do extend beyond the realm of gaming. Much of the music used in the games is created specifically for the game, and can be purchased on their website. The company tried an excursion into the massive multiplayer online gaming world in the form of Final Fantasy XI, which did not take as well as they had hoped. They also produce arcade, Facebook, and iPad games. Square Enix has even extended into printed media in the form of graphic novels, most of which are only printed in Japan. However, the successful series printed Fullmetal Alchemist is printed in America.

4.3.2 Crystal Tools

Square Enix prefers not rely on other studios and engines for its productions, so it makes its own. Crystal tools was developed by Square Enix as a standardized 3D engine. Its focus is primarily on cross-platform capabilities. This means that it was specifically designed to work on PlayStation, Xbox, and PC, with a modified version of the engine able to run on the Wii as well.

4.4 Working at Square Enix

4.4.1 Salary

There are approximately 3,780 members of Square Enix in the Tokyo building as of March 2013. It boasts the leading salaries of all gaming companies in Japan, including Sony and Nintendo, which equates to over \$270,000 a year. This number is much higher than in the U.S. subsidiary. Salaries in the Los Angeles division range from a senior software engineer, who would make about \$126,000 per year, down to a game tester for \$30,000.

4.4.2 Job Opportunitites

Square Enix has announced a number of layoffs occurring in most of its subsidiaries. However, Square Enix has several job openings as QA Testers. Reviews on Glassdoor indicate that workers enjoy their team members, but do not enjoy working for Square Enix. There is a high turn around rate and very little opportunity for advancement. There is also no indication that Square Enix provides in-house amenities like many of the other companies competing for the best and brightest programmers.

4.4.3 A game making process

The making of a single game consists of teams no more than 200 people. There is also a particular process for game creation. Establishing plot and character creations are the first things to happen, along with deciding on artwork style of the game. After that is finished, the battle system and maps are created, followed by the laborious task of creating cut scenes.

4.5 Conclusion

I would not recommend working for Square Enix, although it is said to be a great job for getting your feet wet and gaining experience. However, as a long term career option, there is little room for moving up, nor does it provide many of the amenities that rivaling companies offer. For the salary and environment, other companies would offer a greater benefit package. The games are very well done, paying much attention to detail and quality, and include the top rated games of all times.

Bibliography

Chapter 5

Valve

Zachary Wright

5.1 History

Valve was started by Gabe Newell and Mike Harrington in 1996[7]. Earlier in the 1990's Gabe Newell had done a survey to find out what software was downloaded the most on a PC. The second most popular was Windows while the first was a small game called Doom. This inspired Gabe Newell to try to start his own video game studio. Valve Software was founded in Kirkland, Washington. They started with the game Half-Life which they planned to release in 1997 but was delayed until 1998[2]. Once Half-Life was completed they purchased the rights to various mods and turned them into stand-alone games. Following this early success Valve began work on their own engine code named Source [5].

5.2 Products

5.2.1 Source Engine

The Source engine was created in 2004 and currently all games created by Valve use the engine. The engine itself is known for being easy to use and having powerful physics in its games. The engine has also aged rather well since it is still being used today. The Source engine has been also known for its easy-to-mod interface. Whenever Valve releases a game using the Source engine, they also offer the same tools that they used to make the game. This allows the consumers to create user made content and increases the lifespan of the games much longer than they would have lasted[1].

5.2.2 Steam

Of all the different products Valve has created none have been as successful as Steam. Steam is a games platform in which one can download games digitally and play with friends. Steam was the first to allowed PC gamers to interact with other gamers on one central gaming network. It currently has over 1,400 games and over 30,000,000 users. This has brought PC gaming into the next level. Because of the digital distribution Steam's games have been cheaper and easier to access than on the consoles[3].

5.2.3 Steam Machine

Recently Valve announced its newest project, the Steam Machine. With the Steam machine, Valve plans on taking over gaming consoles by replacing consoles with cheaply made PC's. The Steam Machine will use a Linux based OS which will digitally distribute games in the living room. It will also allow anyone who owns one of the Machines to customize their own consoles. This has yet to come to fruition, but has potential to challenge mainstream consoles[4].

5.3 Positions and Salaries

- Senior Software Engineer: \$143,830
- Multi-media Artist: \$144,429
- Software Engineer: \$106,468
- Multi-media Artist/ Animator: \$130,000
- Senior Software Tools Engineer: \$143,500
- Multi-media Graphic Artist: \$73,424
- 3D Graphics Designer: \$191,750
- Commercial/Industrial Designer: \$43,037
- Partner Account Manager: \$75,000
- Sales Manager: \$42,000
- Artist: \$93,000
- Senior Software Developer: \$146,000
- Economist: \$376,000

- Programmer: \$79,000
- Hardware Engineer: \$153,000 [6]

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Chapter 6

Zynga

Alex Fitzgerald

6.1 Introduction

6.1.1 Zynga's History

In April 2007, Mark Pincus founded Presidio Media. In October 2007, Presidio Media became a Delaware corporation with Pincus as the CEO. Three years later in November 2010, Presidio Media became Zynga Inc, named after Pincus's dog, Zinga.

6.1.2 CEO

In July 2013, Don Mattrick became CEO of Zynga Inc. Mattrick was previously employed at Microsoft, where he served as the president of the Interactive Entertainment Business[1]. In addition to his history with Microsoft, Mattrick also was the president of Worldwide Studios at Electronic Arts. During his career at EA Games, Mattrick helped develop some of the world's most popular games such as Need for Speed, FIFA, and The Sims.[4]

6.1.3 Locations

Zynga has twelve locations, six of which are in the United States. The main headquarters is located in San Francisco, CA. Other US facilities are in Austin, TX; Mountain View, CA; Orlando, FL; San Diego, CA and Seattle, WA. International locations include Bangalore, India; Beijing, China; Bielefeld, Germany; Luxembourg, Luxembourg; Dublin, Ireland and Toronto, Canada. Former locations were in Japan and various states in the US.

6.2 What is Zynga?

6.2.1 Zynga's Mission

Zyngas mission is to connect the world through games. To make this possible, Zynga's games are accessible on social networks and websites such as Facebook, Google+, and Zynga.com. Games are also available on mobile platforms including Android and Apple iOS. This availability and popularity makes Zynga one of the worlds leading providers of social games. These factors increase with Zyngas main advertising scheme, in which players are asked to invite their friends to play in order to gain in-game bonuses.

6.2.2 Zynga's Donations

Zynga donates money to nonprofit organizations across the globe through its players. Since 2009, over a million players have made contributions through Zynga.

6.2.3 Zynga's Partnership

Zynga is also trying to make its games even more accessible by turning them into physical board games. In order to do this, Zynga has partnered up with Hasbro Games, the company behind iconic board games including Monopoly, Life, and Operation.[2]

6.3 Employment

6.3.1 CS Job Opportunities

Since Zynga is such a large company, it contains many job categories with a total of 2,916 full-time employees as of March 2012. All resumes and applications to Zynga are submitted and accepted online. While some are concentrated in public relations and sales, others are strictly computer science. These CS categories include game design and production and engineering.[5]

6.3.2 Job Benefits

Zyngas traditional benefit plan covers medical, dental, and vision in which the company pays 100% of the premium for employees, and 75% for family members. Zynga also offers short term and long term disability insurance, home and car insurance, open vacation policy, and retirement savings plans. It also has additional benefits like pet insurance, commuter benefits, and extra money for intercompany sports teams support. Also, Zynga has a bring your dog to work day that one fifth of the company participates in.[6]

6.4 Controversies

Zynga has copied or strongly derived ideas from other popular games by other companies. Nimblebit games, a small three-person company that developed the game, Tiny Tower won Apples iPhone game of the year award. Soon after, Zynga came out with a game called Dream Heights which looks and plays just like Tiny Tower. This has caused a lot of disdain for Zynga by the public. However, Zynga is not the only company that has stolen ideas from other companies. In fact, Zynga sued the developer behind casual sex app "Bang With Friends" under the claim that the title uses Zyngas trademark with friends.[3]

6.5 Conclusion

Many people feel like Zynga is not expanding because of recent major layoffs country-wide. There is a rumor that Zynga may go bankrupt due to copying other games to make profit. However, Zynga plans on pursuing its goals in creating an online gambling app using real money.

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Part II

Software/Hardware Companies

Chapter 7

Adobe

Gabriel Triggs

7.1 History

Founded in 1982 by John Warnock and Charles Geschke, Adobe Systems, Inc. grew out of the pair's work on PostScript, a computer language used to create vector graphics. Apple had a large hand in the origin of the company, shipping the first printer bundled with PostScript. The PostScript language eventually evolved into the PDF, the most widely used Adobe product [4]. The company quickly moved into the realm of desktop multimedia software, becoming widely known for their photo-editing and desktop publishing applications.

7.2 Products

Adobe offers a suite of multimedia software including After Effects, an application for post-processing movies; Dreamweaver, a website builder; Illustrator, a vector art program; InDesign, a program for making print copy; Lightroom, an application for batch-editing photographs, and Photoshop, a raster art program that is heavily used to edit photographs with greater control than Lightroom. In 2013, the company moved to a software as a service model, in which, rather than paying for a license of a given piece of software, users pay monthly subscription fees to have access to cloud-based versions of these softwares [6]. This change has been met with widespread criticism.

7.3 Culture

Adobe's image is that of "The Creative Company" [1]. They describe themselves as follows: "Who we are is best expressed by what we do with creativity and data and how the two can work together to turn ideas into impactful results." That being said, Adobe's employees do not always see the company as fostering creativity. Rather, some employees call the company stagnant, saying that it values dependability and longevity over innovation. Even if it is not the creative company it claims to be, Adobe has its share of perks. The company offers salaries competitive with other major technical companies, the health benefits Adobe offers its employees are good, and the company is touted as being among the more charitable major technical companies. There are also small perks common to technical companies, including onsite fitness facilities, free full-service coffee- and juice bars, and free use of the company's products.

7.4 Company

As of 2010, Adobe employed 9,022 employees worldwide, with about half of those in the United States and Canada. It had reimbursed \$1,347,000 of tuition costs to 333 employees. The company boasted a 88% satisfaction rate amongst its employees. It gave \$3,000,000 cash and \$46,600,000 worth of software to various nonprofits and charitable organizations [2].

7.5 Careers at Adobe

Adobe offers careers in everything from marketing to artificial intelligence research. Careers in research and development at Adobe require advanced degrees, many requiring Ph.D.s as a minimum qualification. Adobe employs people with backgrounds in IT, law, mathematics, statistics, marketing, computer science, computer engineering, business, financial analysis, and human resources.

7.6 Salary

There are several tiers of salaried employee at Adobe. A software engineer, responsible for application-level programming, makes, on average, \$98,000. A computer scientist, a research position requiring at least a M.S. in computer science, makes, on average, \$110,000. A senior computer scientist makes, on average, \$144,000. Finally, a computer scientist II, a position reserved for employees with Ph.D.s, makes, on average, \$164,000 [7].

7.7 Locations

Adobe is headquartered in San Jose, California. The company has North American offices in Arden Hills, Minnesota, where computer scientists work on Photoshop, Lightroom, and Creative Cloud; Lehi, Utah, where employees work on product development and marketing; New York, New York, devoted to marketing; Ottawa, Ontario, focused on technical support; European offices in the Netherlands, Switzerland, Romania, Ireland, Germany, England, France, and Sweden; and Australasian offices in Australia, India, China, Japan, and Korea [5].

7.8 Security Breach

In September of 2013, hackers gained access to Adobe's records, stealing credit card information for at least 3,000,000 users, login information for at least 38,000,000 active users, and source code for multiple flagship products, including Acrobat, Reader, ColdFusion, and Photoshop [3]. In an effort to help the users whose data was stolen, Adobe offered a year of free credit monitoring to the users whose credit card information was stolen.

7.9 Conclusion

Adobe Systems, Inc. is a large company with all of the baggage, both good and bad, that that carries. They are always hiring in droves, but they are also always firing just as rapidly. There is security, but there is a lack of upward mobility. The company values safety over innovation, even while billing itself as the "Creative Company." Adobe will continue to grow and change in the next decade as it moves to a completely cloud-based company, and it will be interesting to see how this affects careers at the company.

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Chapter 8

DataArt

Molly Lancaster

8.1 History

DataArt is a software development company that creates applications for companies in financial services, healthcare, and travel. They are known for their constant customer interaction and how they outsource work to their satellite branches all over the world. DataArt was founded in 1997 by Eugene Goland and a group of software developers of Russian origins. Goland founded the company in New York but also opened a development center in St. Petersburg, Russia in the same year. [2]

8.2 Goals

DataArt strives to create a product that can be easily adopted by the client. They like having a two-team development process that involves a team of developers and a team of their clients. This allows for the scope of the job to change without interfering with the developers' time line. This type of Agile development gives DataArt a fast project turnover time and a high client satisfaction rating. They also believe in complete transparency when it comes to their projects. The client is given the contact information of every member of the team that is working on their project so that they can ask questions during the entire process. [2]

8.3 Notable Work/ Recognition

DataArt has worked with many companies over the years, including Microsoft, HTC, Fujitsu, Pharos, fivespark, and Iris.[2] They were also named to the *2013 Inc. 5000 List*

of the Fastest Growing U.S. Private Companies for the fourth consecutive year.[3]

8.4 Employees

8.4.1 Development

The development team at DataArt is comprised of Software Engineers that all hold a Masters degree or PhD and a group of developers. The Software Engineers are led by senior management, most of whom helped found the company. Alltogether the company has around 800 employees. The developers all have at least five years of experience and most speak English even in the global branches. DataArt also has a very small employee turnover rate. This may be caused by the fact that they offer funding for staff education and funding for staff certifications. They also train their employees to speak the language of the area they are in so they can better communicate with clients. Since they are willing to pay for the betterment of their employees, it is easy to infer that the company actually values the people they hire. The DataArt site states, "We understand that there are many people who know how to code, but only a precious few know what to code, and go to great lengths in finding bright developers, educating them and making sure DataArt would be an interesting and comfortable place to work in". They also mention how all developers are placed into a small team when they first start working and are often kept in that team for the duration of their career. Each team bonds and gets to know each other which allows them to work together extremely well and get along with each other. [2]

8.4.2 Research

DataArt has a Research and Development division that is led by engineers with PhDs in math, physics, chemistry, and computer science. They specialize in everything from portfolio management, algorithmic trading, logistics, distribution, and digital signal processing. With this knowledge, they work on topics like computer vision, augmented reality, emotion recognition, natural language processing, machine learning, and mathematical modeling.[2]

8.4.3 Benefits and Salary

DataArt's benefit packages include a competitive salary, project bonuses, accident insurance, compensation for medical and dental services and the ability to combine work with study. They also have an internal program of vocational training, language training, and a sports hall that can be rented by employees at no cost.[1]

8.5 Positions

DataArt currently lists these as positions they offer:

- Java Developer
- C++ Developer
- Python Developer
- Ruby on Rails Developer
- .Net Developer
- PHP Developer
- Front-end Developer
- Web Master
- iPhone Developer
- Android Developer
- SharePoint Developer

[1]

8.6 Locations

DataArt has a wide variety of locations all over the world. Their branches are located in the following areas:

- New York
- London
- Switzerland
- St. Petersburg, Russia
- Voronezh, Russia
- Dnipropetrovsk, Ukraine
- Kharkiv, Ukraine
- Kherson, Ukraine

- Kyiv, Ukraine
- Odessa, Ukraine

[2]

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Chapter 9

Google

Paul Hopkins

9.1 In the Beginning

Google began in 1996 as a program called BackRub, a search engine that ran on Stanford University servers for more than a year. Eventually the program started taking up too much bandwidth and the creators, Larry Page and Sergey Brin, had to register it as a domain and that was when Google was born[9]. The following year the co-founder of Sun, Andy Bechtolsheim, wrote a check for \$100,000 to Google Incorporated, which didnt exist yet! On September 4, 1998 Page and Brin filed for incorporation in California and the entity, Google Incorporated, was established.

9.2 Competitors

With todays technology, almost anything can be done over the Internet, including grocery shopping, buying or selling a car, finding a place to vacation, or even ordering a pizza. A search engine lets users describe what they want to find and it returns numerous websites with information about each one for users. There are many search engines on the web today, all of which are competing. Yahoo is one of the largest competitors of Google. Other competitors are Kayak, a travel search engine, and Bing.

9.3 Culture

The culture at Google is very laid back but at the same time it is very upbeat and busy. Eighty percent of the time, senior software engineers are required to be working on their assignments from the company, but in the other twenty percent of their time they

can choose to work on something they choose. Some products that originated from this time are Gmail, Google News, AdSense, Google Sky, and Google Talk.

9.4 Facilities

Google has thirteen data centers total, six of which are in the United States, one in Chile, three in Asia, and three in Europe, all of which are used to store data and compute searches[1]. Googleplex is the corporate headquarters complex, located in Mountain View, California. The complex has 2 million square feet of office space and meeting rooms, which will be 3.1 million once the 2015 Bay View addition is finished. The complex includes multiple recreation centers, workout rooms, locker rooms, massage rooms, assorted video games, foosball, billiards, ping pong, and much more for the employees to enjoy[6]! Another very interesting facility is Google X, which is a secret facility run by Google. It is located about a half mile from the Googleplex facility. Reportedly there are 100 projects currently under development, including the self-driving car, augmented-reality glasses, and a space elevator.

9.5 Bad Publicity

Google has been involved in some questionable practices. One of the things that Google was questioned about was tax avoidance in the United Kingdom. Google generates a lot of profit in the UK, \$18 billion between 2006 and 2011, but it only paid a very small portion of that to the UK government for taxes. Google said that the advertising takes place in Ireland, not the UK, so it did not need to pay more taxes to the United Kingdom. That argument was very unconvincing, and it was proven that UK-based staff were engaging in sales. And that the Ireland staff were just processing the bills[8]. Google was also caught tricking Safari on Apple products into letting it use cookies so that other Google services or partners could adapt advertisements to send to the user. They were investigated by the FTC and fined 22.5 million dollars, the largest penalty ever for a violation of an FTC order, and forced to remove these cookies from Safari users[3].

9.6 Going Green

Since 2007, Google has been using and investing in renewable resources. They have committed over 1 billion dollars to renewable energy projects to help create a clean energy future that is better for their business and the environment. Google data centers use 50% less energy than the typical data center[5]. Google also helps boost the economy by having local advertisements on most of their webpages. In 2012, Google

search and advertising tools helped provide \$94 billion of economic activity for 1.9 million businesses, websites, publishers, and non-profits across the United States[4].

9.7 Products and Services

Google started as just a simple search engine, but since 1996 it has grown into a multi-billion dollar corporation with many products and services. Some of the products include Google Search, Google Books, Google Groups, Google Hotel Finder, Google News, and Google Trader[7]. There are also a few advertising services such as AdMob, Google Grants, and DoubleClick. Most of these services use cookies to track a user on the internet and then adapt the advertisements to that specific user. Google also has released mapping products, development tools, an android operating system, Google Chrome, and even a cell phone. These are just a few of the products and services available through Google and new ones are being released every week.

9.8 Goals

The mission of Google is to organize the worlds information and make it universally accessible and useful. Googles short-term objectives are to expand the workforce for anticipated growth, expand further into international markets, and continue developing new products. Expanding the workforce will help achieve the long-term objective of delivering new advertising technology. Google's organization structure is primarily functional but also includes a few geographical organizations. Google has a unique culture and policies to promote innovation. Google's long-term objectives are to deliver new advertising technology, develop tracking mechanisms, and enable users to search a larger base of information.

9.9 Changes

Google is known for their very impressive algorithms for returning quick and accurate data. The algorithm is changed around 500-600 times a year[2], almost twice a day. While most changes are minor, there are also some major algorithm changes a few times a year. The latest update at the time of this writing is Google Hummingbird, released on August 20, 2013.

9.10 Applying to Google

To become a Googler, the name given to new employees, applicants must make it through five stages of interview questions such as, how many golf balls will fit inside

a school bus? are asked to see how well applicants can think on the spot. Interviewers are looking for good critical thinking skills.

9.11 Jobs

At the end of 2012, Google had around 53,000 employees. The types of employees range from Human Resources, tasked at hiring new workers, to the Software Engineers who are implementing new software for Googles algorithms and websites. Google has many different types of jobs that they have to fill. There are teams of employees who make sure the networks are safe for all of the secure data they hold, and security officers who make sure unauthorized people do not get into the buildings.

9.12 Job Benefits and Perks

The benefits and perks of working at Google seem almost endless. As a Googler you get free food and drinks 24/7. There are multiple cafes and even video games to help employees Google has an onsite doctor, child care, and even workout areas to stay in shape at many of the facilities. The benefits are excellent. They offer all of the normal things that other employers offer and then add more things like travel insurance, more time off, and a bonus if you have a child. They even reimburse employees for classes or degree programs that help them get better at what they do.

9.13 Conclusion

Overall, I believe that Google would be a great place to work. The benefits are great, they pay well, and most of all you are helping one of the worlds largest growing companies sort all of the worlds data so that it is findable and useable. You can travel the world and learn about all of the sites used by Google if you would like to do that. No matter what type of job you may want, Google has something for you!

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Chapter 10

Intel

Neil Butcher

10.1 Introduction

Intel is the major semiconductor producer of the world. Intel is headquartered in Santa Clara, California. The company was founded July 18, 1968. The name of the company came from combining Integrated with Electronics. Intel was founded by Robert Noyce and Gordon Moore, who are pioneers of semiconductor technology. Throughout the years Intel has produced motherboards, network interface controllers, integrated circuits, flash memory, graphic chips, embedded processors as well as other devices related to computing.

10.2 Primary Development

Intel is the worlds largest and highest valued semiconductor chip maker. Throughout the first 13 years of the company Intel primarily developed SRAM and DRAM memory chips. Intel did create a commercial microprocessor in 1971 but was unsuccessful because no one owned a personal computer. Intel is the inventor of the x86 backwards compatible instruction set architecture which is found in most modern personal computers. Intel is a company that continues to be at the forefront of hardware development.

Intel has strong marketing campaigns every year to ensure they are a household name and a brand that is recognized globally. They have been the largest and highest valued semiconductor chip maker, based on revenue. Intel is a company that consistently sets standards for computer hardware. In 2006 even Apple moved over to using Intels x86 architecture marking the x86 as really the most widely used modern computer architecture.

A major product that Intel released is the Sandy Bridge core, which at the time of its release in 2011 was considered the fastest mobile processor. The release of this product caused Intel to increase its market share in the global processor market to 81.8%. Intel also plans to release a processor for tablets and smartphones called Medfield. Medfield is a 32-nanometer processor designed to be energy efficient. [1]

10.3 What x86 is

Throughout the years Intel has exerted its dominance in the microprocessor market with its x86 backwards compatible instruction set architecture. Its earliest version was introduced in 1978 and was based on the Intel 8086 CPU. It was one of the first microprocessors to efficiently use memory segmentation as a solution for addressing more memory. As Intel developed additions and extensions to the x86 they provide full backwards compatibility. When x86 was initially developed it existed initially on a 16 bit extension of Intel's 8-bit based 8080 microprocessors, and was eventually scaled up to 32, and finally 64.

10.4 AMD versus Intel Controversy

While it is hard to dispute that Intel is the top microprocessor developer in the world many different lawsuits have been brought up by the AMD corporation to claim that they use illegal business practices to exercise a monopoly over the microprocessor market. A major lawsuit AMD placed against Intel was filed by AMD in June of 2005 and claimed that Intel engaged in unfair business practices by offering rebates to Japanese PC manufacturers who agreed to eliminate the purchase of AMD microprocessors. [2] In 2009 Intel agreed to pay \$1.25 billion to settle all legal disputes between the 2 companies.

10.5 Company Culture

Intel employs 82,500 employees worldwide, 55% of these employees live in the US. In 2012 Intel's net revenue was \$53.3 billion. Intel is a company that makes an effort to take care of their employees. Computer Science related jobs at Intel range from Software Development to Hardware engineer. Intel is known to hire young, well educated employees. Overall employees who work at Intel tend to enjoy the laid back work environment and the ability to control the hours. Some of the major complaints of employees are many people perform the same task, and the company is slow to change. Intel attempts to have its workers maintain a social-work driven environment often having its employees work together on projects. The management is generally well liked

by employees which indicates a non hostile work environment for employees. Many employees say that it is a high-paced work environment with challenging work.

10.6 Locations and Revenue

In 2006 Intel had nearly 100,000 employees and 200 facilities throughout the world. Intel has facilities in 63 countries, and many states in the US. In 2005 Intel earned \$38.8 billion in revenue. Intel doesn't like to hire outside CEOs. Many of the companies CEOs throughout the years have spent many years working for the company before becoming the CEO, but a CEO must retire at the age 65, this is mandatory retirement policy. In Oregon Intel is the states largest private employer with 15,000 employees. Intel has the worlds biggest market share in both overall PC micro processors and mobile PC microprocessors. [3]

10.7 Salary

Intel pays its employees from \$30,000 – \$1,123,200 a year, with an average salary per year of around \$80,000. Most software and engineering jobs pay from a range of around \$70,000 – \$100,000 per year. Intel provides its employees and their families with health benefits that provide quality health care services. Employees are also provided a stock option, and they even provide a tutoring center for their employees and their family. Intel is a company that is heavily invested in employee health and service. [1]

10.8 Intel's contribution to Education

Intel has spent a great deal of money on developing tools to provide teachers with technologically advanced tools for their classrooms. Intel has named the program Mobile Learning because it allows teachers and students to learn through portable electronic devices. Teachers will be able to keep track of students through tablets and smartphones. Instead of having to purchase and keep track of books, books will be provided through electronic devices. This is just one of the many examples of how Intel is attempting to integrate technology into education. Their goal is to make technology as up-to-date and functional as possible at all levels of education. They have trained over 10 million teachers in their Mobile Learning program

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Chapter 11

Microsoft

Lacy Morrow

11.1 Overview

Microsoft is a multinational technology company that develops a slew of products related to computing, including the world's most widely used operating system, Windows. The company has influences in nearly every facet of digital technology including tablets, smartphones, gaming consoles, enterprise services and embedded systems [4, 10].

11.1.1 Founding

Microsoft began when college dropouts Bill Gates and Paul Allen got word of a new microcomputer, the Altair 8000, and struck a deal to write a programming language for the machine. In the 8 weeks that followed, Gates created the BASIC language, and Microsoft was born. The company was no more than a two-man operation when they landed a deal with IBM a few years later. Gates purchased the source code, QDOS, for a meager \$50,000, made a few conversions, then managed to flip the software to the technology giant as the MS-DOS operating system on a per-license basis. This is often regarded as one of the best business deals ever made [5]. This deal instantly put Microsoft on the board as a key player in the blossoming software industry [1].

11.1.2 Early Years

1977 The first international office is opened in Tokyo, Japan [5]. The company reaches \$1,000,000 in revenue [10]. FORTRAN, COBOL, PASCAL, and Assembler programming languages are released to the development community on a number of processors [2].

- 1980** Gates signs a deal with IBM to develop an operating system for their new personal computer (PC), licensing the software on a per-machine basis. Tim Paterson's QDOS is purchased for \$50,000 and rebuilt into the wildly successful operating system, MS-DOS [2].
- 1981** Microsoft becomes incorporated. IBM releases the PC. Apple Computer asks Microsoft to develop software for their computer, the Macintosh [10].
- 1985-1986** Windows 1.0 is released, revolutionizing the graphical interface for users [1]. Microsoft becomes a publicly traded company [10].
- 1989** Microsoft Office is introduced, becoming the de-facto work suite. [3].
- 1994-1995** Bill Gates launches the William H Gates Foundation. Windows 95 is launched, shipping with the web browser Internet Explorer [10].
- 1998** Steve Ballmer becomes president of Microsoft. Windows 98 launches [3].
- 2001** The most popular operating system in history - Windows XP - is released [3]. Microsoft dives into the console gaming market with the Xbox game console [10].
- 2008-2012** Bill Gates leaves Microsoft [10]. Windows 8 is released along with Windows RT, designed for use on touchscreens and mobile phones. Windows now runs on all electronic devices from laptops and desktops to Coca-cola machines and New York billboards [2].

11.2 Current Business

11.2.1 Products & Services

Microsoft's grasp stretches over most of the technology industry. Currently Windows is the most widely-used operating system in the world for desktop and laptop computers. Recently Windows RT has advanced the demographic of the software into the touchscreen, tablet and smartphone markets. Microsoft also retains almost a fifth of the console gaming market with its Xbox 360, and the upcoming Xbox One will continue evolving the system with its highly-touted Kinect motion-sensing hardware and software technology [4].

Microsoft is a publicly traded company (MSFT). Its current market value as of October 25, 2013 was \$35.73 [8].

11.2.2 Company Values

Bill Gates held the title as the world's wealthiest person from 1995 through 2007. Over the past three decades he and his wife have donated over \$28,000,000,000 to charity.

They also founded the Bill & Melinda Gates Foundation, the largest transparently operated charitable foundation in the world [7]. Microsoft is also notorious for matching charitable donations [4].

11.3 Employment

11.3.1 Positions

Microsoft employs some of the top technological minds in the world and is constantly hiring bright, technologically-savvy individuals spanning a range of specializations and talents. Some areas of focus are software design & engineering, hardware engineering, information technology, tech marketing, operations, research, services & consulting [4]. As with many other technology companies, Microsoft does allow working remotely or telecommuting [9].

Microsoft also offers internships in software development, hardware engineering, user experience, and other IT-related fields. The company has recruiters and recruiting events for students and recent graduates continually throughout the year at many locations internationally [4].

11.3.2 Benefits

The employee benefits at Microsoft rival the best in the industry. Microsoft offers 100% healthcare coverage as well as dental and vision coverage, on-site health screenings, health club memberships or discounts, programs to manage chronic health conditions and quit smoking, access to a 24-hour health-line, as well as office ergonomics resources and tools. Microsoft is also the first major corporation to offer a benefit for autism therapy, providing coverage for Applied Behavioral Analysis (ABA) therapy through Certified Autism Providers [4]. A solid 401(k) plan that includes a company match on contributions and a business-related tuition assistance program are just a couple of the amazing benefits offered [6]. Other benefits include free grocery-to-home delivery, on-site laundry, and significant flexibility in regards to hours and location [6]. Free soft drinks are also available [6].

For students, Microsoft is offering four different types of technical scholarships for the 2014-2015 academic year to current undergraduate students: General Scholarships, Womens Scholarships, Minority Scholarships, and Scholarships for Students with Disabilities [4].

11.3.3 Employee Satisfaction

Microsoft attempts to cultivate a culture of wellness and balance [4]. It is rated as one of the nation's Best Employers for Healthy Lifestyles by the National Business Group

on Health in 2010 [11]. Full-time employees at Microsoft enjoy amazing privileges not available by any other company in the world. Besides being surrounded by passionate and intelligent people, employees have full access to powerful hardware (Microsoft allows and will even foot the bill for custom setups), and every software program that Microsoft produces, as well as the source code (including browsers, Xbox games, and APIs[6]). A library of software resources and books are available to those interested in furthering their skills.

11.3.4 Locations

Finding a Microsoft office workplace location in the United States is easy, with over 100 locations in almost every state in the country. As the company puts it bluntly, they're "practically everywhere." The featured U.S. office locations are:[4] Seattle, WA; Boston, MA; Charlotte, NC; Dallas, TX; Fargo, ND

11.3.5 Future

As tablets, smartphones, and touchscreen laptops become more ubiquitous in our daily routine, Microsoft has rebranded its entire product line and begun manufacturing of the Surface, the first computer to be manufactured by Microsoft [12]. As CEO Steve Ballmer prepares to step down, he notes Microsoft's transformation from a software company to a provider of families of devices and services. A deal with Nokia will mean more integration of Nokia's devices and services [13].

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Chapter 12

National Instruments

Brian Clee

12.1 Introduction

National Instruments is a software company based out of Austin, Texas. They are primarily concerned with producing automate test equipment and virtual instrumentation software. Most of their products fall under the categories of data acquisition, instrument control, and machine vision. While they are located in the United States, they also have large international operation and in 2012 sold products to more than 35,000 companies with revenues of \$1.12 billion.

The company was founded in 1976 by the current CEO and Chairman, James Truchard. The company quickly separated itself from other technology companies in Austin, Texas and made a name for itself. Today it is traded on the NASDAQ and has over 6,800 employees. The company is still growing and continually grows its product line and customer base. One of the most notable features of the company is its frequent inclusion on many top lists for best companies to work for. National Instruments is frequently heralded for their great work community and benefits for employees. For these reasons and more, National Instruments should be at the top of any Software Developer's list for possible employers.

12.2 Company Overview

The current CEO, James Truchard, along with Jeff Kodosky and Bill Nowlin, originally founded National Instruments out of the University of Texas at Austin.

12.2.1 Founding

National Instruments was actually part of a project to conduct research for the United States Navy, using new computer technology for collecting and analyzing data. While they enjoyed their task, they quickly became frustrated with the industry standards for data collection methods and decided to create National Instruments to combat this problem.

Once the company had officially been created in 1976, they began working on a general purpose interface bus (GPIB) for the PDP-11 microcomputer. Their first sales were to numerous Air Force Bases and they began expanding into 1978 when they purchased their first office.

12.2.2 Early Operations

By the end of the 1970s, National Instruments was bringing more than \$400,000 in sales. As they expanded their product line to waveform generators for I.S. Navy sonar acoustic testing they reached over \$1 million in sales by 1981. Following this National Instruments continued developing products, such as working on their GPIB to communicate with IBM machines, and testing out integration with the new Macintosh.

In 1986, however, National Instruments released their flagship product LabVIEW, which is a graphical development platform for Macintosh computers. The software was designed to allow engineers to program graphically by hooking icons together instead of typing code. This development environment quickly became popular and a windows version was later released for the DOS environment.

After the success of LabVIEW, National Instruments continued to grow and release new products for an ever-increasing customer base. They also continued modifying LabVIEW for new demands, for example a C/C++ version was released.

Eventually, once they had reached the \$100 million sales mark they found themselves running out of room. Thus they decided to build an innovative new campus in northern Austin in 1994. This campus was designed to accommodate National Instruments over 1000 employees and was very employee-friendly. It was one of the first in innovative new work and play type campuses, including basketball and volleyball courts, an onsite gym, campus-wide walking trail, universal offices that all employees, regardless of position use.

Over the following years they continued to grow, went public on the NASDAQ, and made a name for themselves as one of the best places to work. National Instruments continued releasing new data collection products and became an industry standard.

12.2.3 Recent Endeavors

At the turn of the century National Instruments was primarily concerned with growing their international operations. They started this push by building a manufacturing plant in Hungary, which today provides nearly 90% of the company's production. Along with this, National Instruments also made great improvements on their web presence and website in order to better showcase their products and improve their web presence.

12.3 Portfolio

Even though National Instruments is well known for their data collection products, they are perhaps best known for their work environment. Perhaps their biggest achievement is being placed on *FORTUNE's* 100 Best Companies to Work For fourteen years in a row. This past year they placed in at number 35 on this list and were honored for National Instrument's commitment of creating an exceptional workplace [1]. Along with *FORTUNE's* list, National Instruments also placed 16th out of 25 for Business Insider's Top Tech Companies to Work For [2]. Clearly National Instrument's is worth taking note for its employee benefits and should be considered highly by software developers entering the work force.

12.4 Work Life

At National Instruments work life is a major part of an average employees love of the company. For one, at National Instruments equality and collaboration are stressed above all. This is illustrated by the CEO, James Truchard, whom works among the average workers by shifting his own cubicle among their own cubicles every week. Almost every non-entry employee who receives an office, as such, has a larger office than the CEO himself. This sense of integration and equality persists throughout National Instruments, and helps to encourage employees to work in teams and produce quality products.

12.4.1 Benefits

Even moreso than the collaborative work life, the benefits offered by National Instruments are reason enough to work there. Noted for being one of the first companies to invest in a massive campus complete with non-traditional facilities, National Instruments has always been at the fore front of employee offerings. For example, the main National Instruments campus in Austin, Texas, has a massive onsite gym which offers 16 classes a week and two sand volleyball courts. Of course, with the onsite fitness

center there are subsidized gym memberships offered. Furthermore, while National Instruments does not support telecommuting, they do guarantee a compressed work-week, which means when the day ends on Friday employees are not expected to work at all over the weekends.

In addition to the standard benefits, National Instruments is also very accepting of all beliefs and lifestyles. This is illustrating by the offering of domestic partner benefits for same-sex couples, and a nondiscrimination policy that includes sexual orientation.

12.4.2 Current Employment

Currently, National Instruments is experiencing small job growth, of only 12% per year. As they only have 3,008 U.S. employees, this means they offer 311 new jobs every year. Balancing this between there nearly 21,000 applicants every year means that getting a job at National Instruments is difficult. This can be expected though, from a long-standing company with incredible benefits and a great work environment. In addition, the average annual pay for a Software Engineer, there most common job offering, is \$90,695. Therefore, it should come to no surprise that many Computer Science graduates seek employment at National Instruments for the high pay and great company. It should be noted it is not impossible to land a job at National Instruments, as they are always looking for bright minds.

12.5 Conclusion

National Instruments is a strong historical software development company that focuses on building products that help to integrate data collection tools into software and online solutions. They offer a wide range of competitive benefits and salaries which make them a high choice for any Software Engineers looking for employment. If you are just graduating with a Computer Science degree National Instruments is well worth checking out for starting an exciting career with amazing opportunities.

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Chapter 13

NetApp, Inc.

Benjamin Dummer

13.1 Background

13.1.1 Company Origins

NetApp was founded in 1992 [5] by Dave Hitz shortly after completing his development of the first storage operating system WAFL (Write Anywhere File Layout.)[7] This revolutionary advancement in data storage helped jump-start a new industry of third-party enterprise data solutions. The NetApp Unified Storage Architecture was released in 2002, marking yet another significant advancement in data management. This architecture greatly simplified data management by unifying SAN (storage area network) and NAS (network-attached storage) systems into a single platform.

13.1.2 Current Company Standings

NetApp today is a shining example of a modern, successful technology giant. Being a Fortune 500 company and earning the 6th spot on Fortune magazine's "100 Best" list[4] takes a lot success. With over 12,000 employees in more than 150 offices worldwide and a revenue exceeding \$6 billion[4], NetApp has certainly earned its merits. As a member of S&P 500 and NASDAQ, and as a major provider for enterprise data management solutions, NetApp has forged many strong relationships with some of the world's most influential companies.

13.2 Products

13.2.1 MetroCluster

No matter how large or complex a data storage solution might be, the fear of data loss due to system failure is ever looming. Solutions that demand constant data availability for mission-critical applications require that system failures be automatically recovered from without downtime. MetroCluster[9] software provides this functionality and more. MetroCluster manages storage systems and provides automated transparent failover, nondisruptive hardware and software maintenance, and end-to-end continuous availability.

13.2.2 Data ONTAP 8 OS

The Data ONTAP OS[8] is NetApps' premier enterprise storage operating system for clustered storage solutions. This highly popular enterprise operating system provides seamless scalability, high efficiency, and nondisruptive operation. Data ONTAP was designed to work on any size system, from a single NAS/SAN storage box, to massive data centers with storage capacities on the order of exabytes. It provides many cutting edge features that allow IT professionals to better manage large storage solutions. No longer must entire systems be taken offline to perform hardware upgrades or scheduled maintenance. This OS is highly dynamic and paves the way for future enterprise Big Data solutions.

13.3 Careers

13.3.1 University Recruiting

NetApp hosts a three-month summer internship program that quickly introduces students into the NetApp community[3]. Interns will work on meaningful, real-world projects with both current employees and other interns. Throughout the course of the internship, interns will be given opportunities to meet executives and other leaders as they give talks in the Summer Speaker Series. At the end of the three-month period, interns will be given the opportunity to showcase what they worked on during their summer at NetApp.

For those who are nearing graduation, NetApp provides many intro-level jobs that will propel entrants to fulfilling careers. Training programs led by senior engineering teams are the first order of business in introducing new members into the NetApp community.

13.3.2 Employee Benefits

Working for a top notch employer comes with lots of perks. In order to keep employees happy and productive, NetApp provides a comprehensive benefits package.

If an employee needs health insurance, several tiers of coverage are available; each tier includes coverage for health, dental, and vision[1]. The insurance plans offered can cover more than just the employee; they can also cover all the employee's family members. Coverage begins the first day of employment[1].

NetApp also offers insurance and income protection programs that can help employees who become disabled. The financial well-being of employees is also ensured through many financial and savings programs, such as a 401(k) plan, employee stock options, and provisioned financial accounts[1]. NetApp's work-life programs include paid vacation time, volunteer time off, educational assistance, and a prepaid legal plan[1].

13.3.3 Career Growth

Providing career growth facilities and opportunities is essential to building a successful business. NetApp U is the in-house "university"[2] and offers technical courses on just about everything one can come in contact with while working there. NetApp U also provides the necessary bridge from newly graduated to technical professional with a two-week intensive training course. The training course is taught by senior engineers and is meant to assimilate new employees into the corporate culture at NetApp as well as give a crash course on all the proprietary technologies that NetApp produces.

Once comfortable at NetApp, employees are given an endless stream of communication and learning environments to help further career success. TOAST (Training On All Special Things) gives a group of one hundred employees a full day of training on everything that goes on at the company. All-Hands meetings are organized each quarter by the senior management staff in order to inform employees of the company's progress — good or bad.

13.4 Culture

13.4.1 Work Environment

There's a reason why NetApp was ranked third on the Great Place to Work Institutes's list of the "World's Best Multinational Workplaces 2012" and sixth on Fortune magazine's "100 Best Companies to Work For 2013" list[4]. NetApp leads the way in innovating work environments as much as it leads in storage and data management

solutions. What really sets NetApp apart from other large companies is the open and friendly atmosphere; talking to the CEO or VP is just as easy as talking to the guy in the next office. The culture at NetApp can be described by several core values: trust and integrity, leadership, simplicity, adaptability, teamwork and synergy, go beyond, and get things done.

13.4.2 Environmental Responsibility

In today's world, we often look to the leading technology companies for examples of environmentally responsible practices - NetApp is no different. Each passing year demand increases for storage capacity and system performance - as a consequence, power consumption has increased too. In order to combat this increase of resource consumption while still satisfying the needs of customers, NetApp has developed a strategy guide that uses resources more efficiently and effectively.

The facilities and employees of NetApp are equally environmentally conscious. The Reduce, Reuse, Recycle programs in use at NetApp have earned the company a California Waste Reduction Award Program award[6].

13.4.3 Job Locations

In the few decades that NetApp has been around, it has spread its roots from the US to several countries around the globe. There are career opportunities at NetApp in exciting countries such as Singapore, India, Germany, and many other locations. For new graduates seeking a position, NetApp has graduate opportunities at Sunnyvale, California (headquarters); Research Triangle Park, North Carolina; Waltham, Massachusetts; and Pittsburgh, Pennsylvania.

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Chapter 14

Red Hat

Brent Simmons

14.1 History Leading to Red Hat

14.1.1 The early years

Red Hat is a software company based on the idea of open source software for the masses. They have taken this idea to new heights by building a successful business with the principle that when you purchase any software designed by them you get all of the source code with it, enabling you to modify the software to fit your needs without fear of legal action and even with help from Red Hat.

The beginnings take us back to the start of ARPANET in 1968 when the free flow of ideas was the driving force behind a network of systems linked together in rapid exchange. This gave birth to UNIX the following year by Ken Thompson who was working at Bell Labs at the time. Later in 1983 Richard Stallman starts the GNU project to create a UNIX based operating system that would be offered with the source code freely distributed to everyone. It was during this time that the other companies, like Microsoft, were getting started and building speed developing operating systems and programs for business use. They did not offer any source code and would not allow the customers access to the software to modify it as to make it a better fit to the companies making purchases.

The idea of offering the customer the ability to change the software they purchased was outrageous at best to most companies but not the the Free Software Foundation. The idea of open source found a foothold in others as well. Micheael Tiemann (the future VP of open source affairs for Red Hat) co-founded Cygnus Solutions. Cygnus was the first business solely focused on offering support and custom solutions to free software. All of this happened before the start of the 1990s, before the founding of

Cygnus and during the release of the version 1 GNU General Public License software which both happened in 1989 Microsoft started Windows. This will become the start of the David and Goliath battle yet to come between the open source and closed source.

The ground work for what will become Red Hat has been laid. It took Marc Ewing creating his own version of Linux (another form of UNIX) in 1994 and dubbing it Red Hat Linux. This was released in October of 1994 to which Red Hatters have taken to calling it the Halloween release. Though this was just the spark of life for the company, it took Bob Young of ACC Corp. in 1995 to buy out Ewing to formally form the Red Hat company we have today. Which in the same year released Red Hat Linux 2.0 and unveils RPM, a package management system. The following year Red Hat opens an administration and sales office in Durham, NC and makes it the official headquarters of the company.

14.1.2 Red Hat in the Industry

Red Hat as a company has been targeted by larger closed source companies since its humble beginnings. The largest proponent to the idea of open source software has of course been Microsoft. The official slandering of this idea of giving control of the product purchased by companies and individuals alike, has been called the Intellectual property destroyer and a cancer. [2].

The man behind such comments of course is Microsoft's own CEO Steve Ballmer. Large profit based companies fear Red Hat and the GNU ideals of releasing the source code with its products. These actions cut into the profit margins of these companies. They would have people closed off from the products they buy so they have to pay for any customizations or modifications. Give more money to the closed source companies so they will grant you a little more of what you need out of the product you have purchased.

14.1.3 Work place Environment

The working environment of Red Hat has the all hands on deck mentality. Meaning that you can and will be placed on many different projects, not all of which is in familiar territory for you. You are expected to hit the ground running and to work in groups that may have remote entities. [1].

The projects are fast paced and sometimes a bit overwhelming according to some employees of the company. The benefits and pay are comparable to other software companies, ranging from \$70,000 to \$110,000 for low to mid level programmers to upwards of 125,000 for supervisors. [1]. Health and other benefits are standard fare and hard to get exacts on, according to my research. To work for Red Hat you need to maintain the ideal that the information should not be held back from anyone. If you buy software then it is yours completely, you can do with it as you please. Making

a huge profit and cut throat styles of business are not practiced at Red Hat and those who are of a like mind will not do well there. The company was founded on the idea that the information is free and should be given freely.

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Chapter 15

SAS

Keith Miller

15.1 History

15.1.1 History And Growth

All information presented in this chapter was obtained and available at SAS website.[2] SAS began in the 1960s as a research project at North Carolina State University led by James Goodnight and Anthony J. Barr. It was intended to analyze agricultural data from the United States Department of Agriculture in order to increase crop output. A consortium of eight land-grant universities that made up the University Statisticians of the Southern Experiment Stations, which was primarily funded by the USDA, funded the project under a grant from the National Institutes of Health (NIH). When NIH discontinued funding in 1972, consortium members chipped in \$5,000 each per year to keep developing and maintaining the system.

By 1976, the project had more than 100 customers and the four leaders of the SAS project left the university to incorporate SAS Institute in Cary, NC. Its first SASware Ballot, where customers are asked for suggestions to improve the software, was introduced the same year. By 1978 the company had 21 employees and 600 SAS customer sites. In 1980 SAS moved its headquarters to its current location in Cary, NC.

During the 1980s, SAS was one of Inc. Magazine's fastest growing companies in America for six consecutive years. During the 1990s, SAS grew to 7,000 employees. As of 2011, SAS had more than 50,000 customer sites and 200 products.

Near the end of the year in 2013, SAS had over 13,000 employees worldwide, with about 6800 of those employees living in the United States. About 5100 employees work in the headquarters in Cary. Other locations for work include Canada, Latin America, Europe and Asian Pacific. Around the same time, SAS has over 65,000 customer sites

worldwide with 90 of the top 100 fortune 500 companies making use of SAS software and solutions.

15.1.2 Health of the Business

SAS has been profitable each year for 35 years as a private company. Approximately 25% of revenue is spent on research and development. SAS CEO Jim Goodnight has been able to keep the company private because the company has no debt and large cash reserves.

SAS had revenues of \$138,000 its first year in business in 1976. It grew to \$1.18 billion by 2002 and 2.87 billion in 2012. SAS' partners include Accenture, Capgemini, Deloitte, EMC Greenplum (a division of EMC), Hewlett Packard, IBM, Oracle and Teradata.

15.2 Products and Services

SAS focuses on analytics for other business. SAS has a software suite that is offered to customers to help them manage and organize data. The software suite can be tailored to work with data sets from many different fields. Some of the industries that SAS works with, of which there are a great many, include casinos, communication, hotels, insurance, manufacturing, media, and utilities. Typical solution lines for the various types of products offered include analytics, data management, financial management, security intelligence, performance management and risk management.

SAS software bundle is sold by product key that works for exactly one year. After this time, clients must renew their product key to continue to access SAS software and services. Also, SAS personnel work very close with their clients to help them achieve their goals and help provide solutions to problems that might arise concerning the software or any other type of business problems.

15.3 Career Path and Salary

SAS has three main career paths. These include Professional Opportunities, Internship Opportunities, and Fellowship Opportunities. Many of the Professional Jobs require a Bachelor of Computer Science and experience.

Typical jobs include programming across many different languages as well as experts from various fields of economics, sciences and statistics. The SAS software package has its own programming language where competencies and certifications can be acquired. SAS has a wide variety of individuals from all educational backgrounds.

Salaries range from \$30,000 all the way to over \$100,000 annually according to the nature of your involvement, background and experience. Entry level programming

positions usually star between \$50,000 and \$60,000 annually with these positions being considered full time. Employees work by contract or may be full time with full benefits.[1]

15.4 Culture

SAS is known around the world for having the best internal culture in the entire world. Employees with benefits get access to child care, an onsite gym, excellent medical, unlimited sick days, and stock options. It is very common to work right alongside your manager while working on projects and solving problems. There is little to no middle level management.

The fitness and recreation center is available to employees from six a.m. to eight p.m. five days a week and also open every other Sunday. SAS has quite a few fitness programs such as Commit to Quit which is designed to help individuals quit smoking. Other incentivebased programs award a unique for of currency which can be used to purchase items internally, such as sports gear, clothing, and other sundry sports paraphernalia.

SAS headquarters also includes many luxury based services. Book exchange, car detailing, skin care, massage therapy, nail salon are a handful of services provided to full time employees. The company also has an onsite store and discount services available.

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Chapter 16

Sony

Dylan McGoun

16.1 History

In May of 1946, Masaru Ibuka established the company, Tokyo Tsushin Kogyo, in Nihonbashi, Tokyo [4]. In 1950 the company released the Soni-Tape, a magnetite and paper-based recording tape. Later that same year they released Japan's first tape recorder, the G-Type. The company released Japan's first transistor radio, the TR-55, in 1955. Three years later the company changed its name to Sony Corporation. Sony launched the 'Trinitron' color TV, the KV-1310, in 1968, and later received the first Emmy ever awarded to a Japanese company for the development. The first portable music player, the Walkman, was created by Sony, in 1979. The Compact Disc was created by Sony, in collaboration with Philips, and the company then released the world's first CD player, the CDP-101, in 1982. Sony created the first digital camcorder, the Digital Handycam, available to consumers in 1995. Sony and Philips also worked in collaboration to create the Blu-ray Disc and player.

16.2 Branches

16.2.1 Sony Computer Entertainment (SCE)

SCE was established in November of 1993 [1]. This branch produces video game consoles and video games. SCE's headquarters is located in Tokyo, Japan. The first product released by SCE was the PlayStation, in December 3, 1994. It was the first video game console to achieve sales of 100 million units [3]. The success of the PlayStation led to the demise of cartridge based games. The most successful product was

the PlayStation 2, which was the best-selling console of all time. Along with releasing the best-selling console, they were the first company to release a console with Blu-ray capabilities, the PlayStation 3, which was cheaper than most Blu-ray players at the time of release and was sold at a loss. SCE is planning on releasing the PlayStation 4 on November 15, 2013. SCE also released two handheld consoles, the PlayStation Portable and the PlayStation Vita. Both were successful, but not ground breaking. The branch recently released the PlayStation Vita TV in Japan, and plans on releasing it internationally at a later time.

Nearly all consoles released by SCE have been successful, except for the PSX, which was only released in Japan and, due to high cost, did not sell many products. SCE has had an extremely large impact on the video game console market. Sony Online Entertainment, a branch of SCE, released Everquest, an MMORPG, which set the model that many other MMO's have used for over ten years. SCE's main competitors are Nintendo and Microsoft.

16.2.2 Sony Music Entertainment (SME)

Sony acquired CBS Records in November, 1987, and later renamed the branch to Sony Music Entertainment. It is one of the largest record companies in the world, second only to Universal Music Group. In 1995 Sony/ATV Music Publishing was formed, when SME and Michael Jackson formed a joint venture, which merged SME's publishing operations with Jackson's ATV Music [?]. In 2012, Sony/ATV acquired EMI Music Publishing, which makes Sony/ATV the largest music publisher in the world [7].

16.2.3 Sony Pictures Entertainment (SPE)

Sony acquired Columbia Pictures Entertainment in 1989. The acquisition cost Sony \$4.9 billion, and it was backed by five major Japanese banks [8]. The branch was unsuccessful for the first several years. SPE produces television shows and films. It is currently ranked third among movie studios. The CEO recently announced that SPE would cut its 2014 film output in order to shift emphasis from movies to television[6].

16.2.4 Sony Mobile Communications

Sony partnered with Ericsson to create mobile phones in October, 2001. The company was called Sony Ericsson. It struggled for years, until Sony bought Ericsson's stake and renamed the branch to Sony Mobile Communications and moved the headquarters to Tokyo, Japan. The first product released, after the acquisition, was the Sony Xperia S. Sony's phones initially ran on their own OS, but recently switched to the Android OS.

16.3 Employment

Sony has around 146,300 total employees. The SCE branch offers the most jobs for computer scientists. The average salary at SCE is around \$94,000. A less experienced programmer's salary starts around \$74,000, while a programmer with 6 or more years of experience can make over \$125,000. Employees at SCE receive medical, dental, visions, and life insurance. SCE also offers a 401k SCEA that matches dollar for dollar up to 4%. Employees also receive discounts on SCE products.

16.4 Fincances

From the 1900s to the 2000s, Sony ran a very profitable business, but the company's profit fell greatly leading up to 2011. Sony has had to reduce its workforce greatly in the past few years and sold its US headquarters. Sony has recently increased its marketing spending in an effort to make more sales. The PlayStaion 3 has not been profitable for Sony, with an estimated \$4 billion loss over its lifetime [2]. 2013 is the first full-year profit in five years for Sony. The TVs shipped fell by 38%, while the smartphone shipped grew by 27% [5].

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Part III

Other Companies

Chapter 17

Audible

Chris Detsch

17.1 Introduction

Audible is an online website company which provides audiobooks to its clientele, allowing them to download files directly to their computer or mobile audio device. Audible is a company that was designed to be a literary service for avid readers who wished they could read more and for the less avid readers who wanted to read but did not have the time to read what they want.

17.2 History

17.2.1 Early Years

Founded by Donald Katz in 1995, Audible was one of the few start up companies to survive the dot-com bust. In 1997 Audible was the first company to produce a digital audio player, creating The Audio Player four years before the iPod was introduced by Apple. [3] [8]

17.2.2 Recent Years

As part of Amazons attempt to increase their audio download offerings and better compete with Apple's iTunes, Amazon bought Audible for \$11.50 per share, roughly \$300 million. Audible became a subsidiary company of Amazon, tying most of their products in with Amazons, most notably with the Whispersync technology, which will be discussed in the WhisperSync section of this report. [6]

17.3 Product

17.3.1 The Basic Product

Audible.com provides access to a library of audiobooks which a subscriber or customer can purchase. They provide the ability to buy audiobooks at a marked down price over buying the audiobook in cd/tape form. Audible customers also have the ability to subscribe much like Netflix. For \$14.95, subscribers can download one free book per month and purchase other at a reduced cost.

17.3.2 New Audiobooks

Audible has created two new ways to grow their library outside of purchasing from large publishing companies. The Audible frontiers is a program where by Audible creates brand new audiobooks from existing books to add to their library. They have also launched the Audiobook Creation Exchange which is an online platform that connects the rights holders of books with audiobook producers, allowing more books to be turned into audiobooks. [3]

17.3.3 Whispersync

Whispersync is a crossover technology which allows readers to switch back and forth between reading text on the Kindle and listening to the book in audio format. The Whispersync technology will save the users place from the Kindle, update the audio, and start at that place in the audiobook, doing the same for the users Kindle when switching back to text. In addition they are rolling out a new program on Kindle allowing the bundling of ebooks with Audible audiobooks. After you open a new ebook the Matchmaker service will allow you to make a one-click purchase of the corresponding Audible audiobook, sometimes with deals on the audiobooks for \$3.95 or less. [7]

17.3.4 Mobile Apps

In addition to creating programs to enhance sales on their own proprietary products, Audible has done well to capitalize on the growth of the mobile app world. The Audible app is available on Apple, Android, and Microsoft mobile phones and players. It allows users to download any audiobook currently in their library directly to their mobile phone or player. The app keeps the audiobooks separate from music and keeps bookmarks on all the books in your library across all devices, and keeps the app running efficiently with regular software updates. [2]

17.4 Employment

17.4.1 Jobs in Computer Science

The company's job listings are mainly seeking CS majors with Bachelors and Masters degrees, and require knowledge of several programming languages including Java, Perl, Ruby, Python, and C. The programming jobs, however, seem to seek primarily applicants with at least a Masters degree. Unfortunately, based on some of the reviews on Glassdoor.com, a large number of their positions are only available as contract work where, after 11 months of working with the company, the employee must go through a 3-month period where they cannot work for the company. [4]

17.4.2 Compensation

The pay offered by Audible is very competitive with most of the salaries reported on Glassdoor averaging close to \$100 thousand including bonuses. According to several of the reviews, the company is growing and has a large amount of work that requires employees to work long days and overtime. [5]

17.4.3 Benefits

Audible, as an Amazon company, provides a fairly comprehensive benefit plan including dental, vision, and a choice of several different health plans. They also provide company paid life and disability insurance, and provide several employee discount plans, which according to several reviews on Glassdoor, includes free audiobooks for their employees. The company provides salaried employees with vacation time of two weeks in the first year and three weeks of vacation time in the second year. Working at Audible also entitles an employee to Amazons 401k with matching program and for certain positions, stock options. [1]

17.4.4 Facilities

Audible.com is run out of the companies facility in Newark, NJ, but also has international locations including outlets in London, Berlin, and Paris. According to Glassdoor reviews by employees who work or who have worked at the company the work environment is very nice and they provide several perks like free lunch in their cafeteria. One current employee remarked on Glassdoor, "Physical space (lots of natural light, open floor plan, etc.) contributes to that healthy culture." [3]

17.5 Conclusion

Overall Audible seems like it has its pros and cons when looking at it as a potential employer. The company seems to overwork their employees some but also provides a strong work environment and competitive salaries and benefits.

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Chapter 18

Netflix

Alex Weidner

18.1 History

18.1.1 The Beginning

Netflix was founded in 1997, starting its subscription-based DVD distribution in 1999. It was founded in Scotts Valley, CA, by Marc Randolph and Reed Hastings. Randolph had experience with startups as he had co-founded a mail order company named MicroWarehouse and had spent time as vice-president of marketing for Borland International. Hastings was the founder of Pure Software, which is where he initially met Randolph. Hastings sold Pure Software for \$700M, \$2.5M of which he turned around and invested into Netflix [2].

18.1.2 Initial Growth

Netflix's popularity grew as its library of available titles grew. When Netflix began, it only had 925 works available for mail order on a per basis charge. In 2000, Netflix dropped that system in favor of a flat rate for unlimited rentals. In 2002, Netflix went public, selling 5.5M shares for \$15 dollars apiece. Netflix did not post its first profit until 2003, earning \$6.5M profit on revenues of \$272M. By 2005, Netflix had 35,000 titles available and was shipping over one million DVDs a day [2].

18.1.3 Expanded Markets

As Netflix grew, it expanded into the online market, offering an online streaming library alongside its mail-order DVD library. Netflix bolstered its libraries with a bevy of deals with media giants, such as an October 2008 deal with Starz Entertainment to

bring more than 2,500 new movies and television shows to Netflix Instant, and a five-year deal reached in August 2010 with Paramount, Lionsgate, and MGM. Netflix has spent money to move into foreign markets as well, releasing its services in Canada initially in 2010, and now the UK, Norway, Denmark, Sweden, and Finland. With the success of Netflix's streaming platform, they have also moved from pure content distribution to content creation, attaining the intellectual property of previously cancelled shows and creating their own intellectual property [2].

18.2 Products

18.2.1 Services

Netflix offers two services to its 33 million subscribers: an online streaming library full of titles (referred to as Netflix Instant), and a by-mail order system for delivering DVDs not usually offered by Netflix Instant. Netflix offers HD options both online for streaming and by mail. The Netflix Instant library boasts over 11,000 titles. In 2005, over 35,000 titles were available by mail via Netflix [2].

18.2.2 Relying on Other Markets

Because Netflix is still predominantly a content distributor instead of a content creator, the company must work with media corporations in order to purchase the rights to stream or rent their content. This worked to Netflix's benefit early on in the company's history because they were small and relatively unhead of. Since Netflix's massive growth, media corporations now understand how much Netflix can make from their content. As a result, the amount that Netflix has had to spend in order to retain old contracts or acquire new content has increased significantly. Netflix has lost content in recent years due to content studios or other corporations (such as Starz) hiking their prices upon contract renewal. Netflix also recently lost 1,800 titles as MGM, Universal, and Warner allowed their contracts to lapse in order to start Warner Archive Instant, their own competitive streaming platform [8].

18.3 Health and Outlook

18.3.1 Revenue and Stock Price

Netflix's stock price as of November 24, 2013 is \$347.85, which is almost a 200% increase since 2010, when the stock price grew by 179% to 175.70 [2]. Netflix suffered a steep stock price dip in 2011 when they announced separating the online and DVD portions of their service. Their current stock prices are \$34 higher than the peak (\$299) before the crash in 2011 [2]. With a 2012 revenue of \$3.61 billion, and although the

slightly lower 2012 net income of \$17 million, it is clear that Netflix is still a competitor in the market. Netflix also boasts assets of \$3.97 billion and an equity of \$745 million.

18.3.2 Size

Netflix had 2,045 full-time employees in 2012 [2]. Some estimate numbers including part time employees are as high as 5,000 employees [4].

18.3.3 Outlook

Netflix is no stranger to making unpopular decisions that lose them subscribers. In 2011, Netflix announced that it was going to split the DVD and popular streaming library into two separate services with two separate subscription fees. The company promptly lost over 800,000 subscribers in the third quarter of 2011 [2]. Despite the loss in overall subscribers, Netflix's earnings spiked by 63% in the third quarter. The next quarter, Netflix gained 610,000 subscribers and had regained the ground lost from splitting their services. Since then, Netflix has looked healthier than ever, spending more money on streaming content and going as far as to produce its own content. The number of Netflix subscribers is at an all time high currently, 33 million.

18.3.4 Rivals

Netflix, being in the unique position of being both a physical and digital content distributor, has rival companies on every front. Companies that offer direct competition via streaming like Hulu, Amazon Prime, Warner Archive Instant, and HBOGo are definitive rivals. Amazon Prime has been known to try and sweep up titles that have been dropped from Netflix Instant, and although Hulu focuses entirely on television shows, Netflix has to compete with Hulu for contracts with content creators [8]. Companies like Blockbuster and Redbox are direct rivals to Netflix DVD service, since they aim to allow customers to have the movie the same day they desire it, as opposed to days later via the postal service.

18.4 Company Culture

18.4.1 Salary and Employee Benefits

According to Glassdoor.com, the average Netflix software engineer that has submitted their salary to them is \$172k annually. Whereas hardware and platform engineers averaged \$135k [9]. Netflix is known for its policy of allowing an unlimited number of vacation days to a salaried employee. Some have attributed this policy to the overall happiness of the average Netflix Employee. Netflix offers any portion of an employee's

pay check in the form of stock options if they so desire [5]. Netflix employees, of course, have access to a free Netflix account [9].

18.4.2 Types of Employment Opportunities

Netflix offers many technical jobs across almost all disciplines. This includes data science engineering, cloud and platform engineering, user experience and user interface engineering, and IT operations. This means that jobs at Netflix can range from designing what the user sees and experiences when they use Netflix to processing and analyzing all the data gathered about user's actions. Despite a wide array of employment opportunities, most of the jobs available are for senior positions. Even the more basic employment opportunities listed on the Netflix website require at least 5 years of experience in the position [3].

18.4.3 Work Environment

Netflix has a reputation for centering the workplace around the employees. This is seen in the previously mentioned unlimited vacation day policy and the perk of Netflix allowing any employee to take any amount of their wages in the form of stock options. Former employees report that teamwork takes high priority at Netflix to the point of team members contributing to peer employee reviews [9]. Hastings is known to judge success not by hours worked but by amount of productivity [5]. Recently some former employees have come out voicing concerns over management and issues stemming from the large amount of turnover experienced at Netflix [1].

18.4.4 Employee Mobility

Previous employees have complained about lack of upward mobility offered to them [9]. There is a large amount of reported turnover from former Netflix employees as well, limiting the potential for upward mobility [1]. Despite this, most employees say they felt secure in their job but did not feel they could move upwards in the company [9].

18.5 Location

Netflix has several main branches: Los Altos, CA (headquarters); Beverly Hills, CA; Hillsboro, OR. Netflix also has operations branches throughout the US. Netflix's job website also lists positions available in Fremont, CA and Santa Clara, CA for technical positions. Almost all job opportunities at Netflix are on the west coast, so a person who would like to work for Netflix should be willing to relocate [3]. Not many former employees mention working from home specifically [9], but salaried employees are

offered unlimited vacation days, meaning employees could potentially choose to use that time to work from home.

18.6 Global Responsibility

A study done in 2007 showed that it actually expended less energy to have a DVD mailed to you via Netflix than to drive to the local video store and rent it yourself [6]. Otherwise, Netflix's global impact is very small compared to traditional brick-and-mortar stores. In terms of charity, Netflix CEO Reed Hastings has been in the spotlight previously for his charity work, including his involvement in the Giving Pledge [7].

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Chapter 19

Red Bull

Adam Van Hine

19.1 History

19.1.1 The Beginning

In 1987 Red Bull was founded by Dietrich Mateschitz after he left Blendax, a toothpaste company. He began selling the energy drink at a home market in Austria. The drink was inspired by functional drinks that were popular in the Far East. At this time there were no other products like Red Bull on the western market. The headquarters are based in Fuschl am See which is not far from Salzburg, Austria.[3]

Early Production Although the company was created in Austria the drink we know as Red Bull was concocted many years earlier. In 1976, a Thai billionaire named Chaleo Yoovidhya created Red Bull in Thailand. At this time the drink was very popular with truck drivers in the region. Chaleo and Dietrich partnered in the company and invested \$500,000 into the company. They each held 49% of the company and gave the remaining 2% to Chaleo's son.[1]

19.1.2 Market Success

In 1992 Red Bull expanded from Austria. At this point they were found in Hungary and Slovenia. It was not until 5 years later in 1997 that Red Bull landed in the United States. After the company became popular in California the company spread all over the world in the following years. The owner of Red Bull, Mateschitz, was named by Forbes magazine as the 250th richest people in the world. In 2008 he had a net worth of \$4 billion.[2]

19.2 Marketing

19.2.1 Sponsorship

Red Bull has sponsored extreme athletes from its very beginning. Just 1 year after the company was founded in 1988, Red Bull held an event known as Dolomitenmann. This marathon continues to be held in Austria and consists of climbing mountains, paragliding, kayaking, and mountain biking. Today the company sponsors athletes from a wide variety of extreme sports including BMX, skiing, flying, downhill mountain biking, and skateboarding. Red Bull is most known for its racing sponsorships. Red Bull Racing has become a huge name in racing and continues to grow all around the world. The company funds all different kinds of racing, from formula 1 to NASCAR even Air Racing. Recently Red Bull has sponsored driver-less car races including the DARPA Grand Challenge in 2005, which was won by the team Red Bull was sponsoring.

19.2.2 Team Ownership

19.2.3 Racing

Red Bull Racing consists of a Formula 1 team which is based in Italy and an American NASCAR Team. The Formula 1 team became championship winners with only 7 years of experience. Red Bull NASCAR also has many championships under its belt.

19.2.4 Soccer

This company has been very active in the European and Austrian Soccer leagues. Red Bull also owns the MetroStars which are a Major League Soccer team that represents New York City.

19.2.5 Ice Hockey

Ice Hockey is another sport that Red Bull is involved in. In 2000 the company purchased Salzburg's hockey team and renamed it 'Red Bull Salzburg.'

19.2.6 Racing

Formula 1 World Drivers' Championships(2010, 2011, 2012)
Formula 1 World Constructors' Championships(2010, 2011, 2012)

19.2.7 Football

Austrian Bundesliga(2007, 2009, 2010, 2012)

19.2.8 Ice Hockey

Erste Bank Eishockey Liga(2007, 2008, 2010, 2011)

Continental Cup(2010)

European Trophy(2010)

19.3 Locations

The Headquarters of the company Fuschl am See, Austria. This is very close to Salzburg which aided the growth of the drink. The company had a very positive impact on the region right from the start. It was just one year after they were founded that they began to hold extreme sports events and sponsor competitors. Red Bull gmbH has focused on making sure that the production of their product is very environmentally friendly. There are many reasons they use cans for their products. Cans are 100% recyclable and also much lighter than bottles, making them cost much less to transport. Red Bull has 80% of their energy come from renewable resources. Another way they help keep the environment safe is by using something called Wall-to-Wall production. This essentially means that they produce their cans and fill them in the same site to reduce on transportation.

19.4 Products

Red bull has had many issues with selling their product around the world. The drink is caffeinated and some places are hesitant to allow a company to distribute their product in their country. For this reason you will find that the amount of caffeine found in Red Bull varies from country to country. According to Red Bull's web site they have produced 35 Billion cans since they began production back in 1987. For such a successful company just doing a bit of research will show you that the company does not have positive media attention. Many people worry about the negative impacts an energy drink has on health. As a result of this negative attention many countries have put restrictions on, not only the product, but on the way that the company is allowed to advertise. In 2001 the UK put advertising restrictions on the company due to many complaints made by the public.

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Chapter 20

Samaritan's Purse

20.1 History

Samaritan's Purse is a non-denominational non-profit evangelical christian organization founded by Bob Pierce in 1970 to assist in disaster relief and mission work across the globe. After World War II, Pierce travelled throughout Asia doing evangelical and journalist work. Pierce eventually met some women in China that were giving everything they had to share Christ's love with lepers and orphans. These women inspired Pierce, perhaps more than anyone else he had come in contact with. It was not long before Bob Pierce had a vision for a ministry that would some day change the world. "He dedicated himself to finding and supporting other such Christians who were caring for the poor and suffering in the distant corners of the world." [2] His original mission for the organization was "to meet emergency needs in crisis areas through existing evangelical mission agencies and national churches. [2] The inevitable success of the the company allowed Samaritan's Purse to be much more.

Bob Pierce and Franklin Graham (Billy Graham's son) met in 1973. The friendship between these two men would prove to be vital to the future growth and success of Samaritan's Purse upon Bob Pierce's passing. "Bob Pierce died of leukemia in 1978, and a little over a year later, Franklin Graham became the President and Chairman of the Board of Samaritan's Purse. Through over thirty years of earthquakes, hurricanes, wars, and famine, Franklin has led the ministry in following the Biblical example of the Good Samaritan all across the globe. God has blessed the organization under Franklin's leadership, and the ministry has seen explosive growth." [2]

20.2 Mission Statement

Samaritan's Purse is a non-denominational evangelical Christian organization providing spiritual and physical aid to hurting people around the world. Since 1970, Samar-

itan's Purse has helped meet needs of people who are victims of war, poverty, natural disasters, disease, and famine with the purpose of sharing God's love through His Son, Jesus Christ.

The organization serves the Church worldwide to promote the Gospel of the Lord Jesus Christ.

20.3 Ministry Projects

- Operation Christmas Child
- US Disaster Relief
- World Medical Mission
- Children's Heart Project
- HIV/AIDS Project
- Turn on the Tap

Franklin Graham developed Operation Christmas Child in 1993. Each year, Samaritan's Purse collects shoe box donations from partnering ministries to distribute around the world. The shoe boxes are filled with toys, school supplies, children's books, small clothing items, and Christian literature. From the year Operation Christmas Child began through this past year, "some 100 million gift boxes have been handed out in more than 130 countries." [3]

U.S. Disaster Relief is a ministry in which volunteers respond to domestic disasters, along with those in Canada, by repairing damaged houses, distributing food/clothing, and providing medical assistance whenever necessary. "The organization has four tractor-trailer units loaded with emergency supplies and equipment. Each can serve as a self-contained base in a disaster zone." [3]

"World Medical Mission, the medical arm of Samaritan's Purse, was founded in 1977 by brothers Dr. Richard Furman and Dr. Lowell Furman to enable doctors to serve short-term assignments at overwhelmed missionary hospitals. The Post-Residency Program supports physicians as they serve two-year terms in mission hospitals and consider becoming career missionaries. World Medical Mission also operates a warehouse that ships equipment and supplies to mission hospitals and provides them with technical support." [3]

Children's Heart Project is a ministry where Samaritan's Purse reaches out to children who were born with or developed heart defects and are living in countries that are not able to provide them care. The children are brought to the U.S. where their surgery and needs are taken care of by surgeons through donations from churches and hospitals.

“HIV / AIDS Projects mobilize private, church, corporate, and government resources to respond to the AIDS pandemic. In partnership with the President’s Emergency Plan For AIDS Relief, Samaritan’s Purse is working in East Africa with education about the disease and abstinence-based prevention programs.”[3]

“Turn on the Tap is a campaign to provide safe drinking water in the developing world. Samaritan’s Purse-Canada holds the license to build BioSand Water Filters, which can provide a family with a perpetual source of safe drinking water. Samaritan’s Purse also drills and repairs wells, sets up large-scale filters in disaster zones, and helps to educate communities in hygiene and sanitation.”[3]

20.4 Employee-Testimonial

I conducted an interview with a former Samaritan’s Purse employee who is also a CIS graduate of Appalachian State. I have made an agreement to keep his name and certain additional details disclosed as a matter of company confidentiality. I will refer to the former employee under the pseudonym Dan. Here is Dan’s interview in question and answer format:

Me: “When did you work for Samaritan’s Purse and what was your official title?”

Dan: “From 2003-2006. My official title was Help Desk Hardware Technician.”

Me: “What were the specific qualifications necessary for acquiring the job?”

Dan: “At least a two-year degree, and they preferred an A+ certification.”

Me: “What was a typical day in the office like? What were your responsibilities each day?”

Dan: “General tech support, answering telephone calls, assisting office workers, assisting office workers internationally over the phone, preparing computer donations and computers to be used on the field.”

Me: “Who made up the IT department when you worked with the company.”

Dan: “Approximately five-seven programmers as well as five employees in the network department assisting in phones, servers, network equipment, and spamming.”

Me: “Finally, did you enjoy working for Samaritan’s Purse? Why or why not?”

Dan: “Yes, the company was very responsible with their funds (budgets had to be approved, financial statements are open to the public, etc.), and I really enjoyed the benefits of serving in a ministry and serving the Lord as a job.”[1]

20.5 Financial

Samaritan’s Purse makes approximately \$300 million annually. The organization is transparent about how this money is distributed with 88

“Its financial statements are prepared in accordance with generally accepted accounting principles, and an annual audit is performed by Dixon Hughes Goodman

LLP, an independent public accounting firm. A financial report is available on the organization's website.”[3]

20.6 Locations

“Samaritan's Purse works in more than 100 countries around the world. International headquarters are in Boone, North Carolina, with additional U.S. facilities in Charlotte and North Wilkesboro, N.C. Affiliate offices are in Australia, Canada, Germany, Ireland, Hong Kong, Netherlands, and the United Kingdom. Field offices are located in some twenty countries across five continents.” [2]

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Chapter 21

SkyLine Membership Corporation Report

Michael Pestrak

21.1 Company History

21.1.1 Founding

The company was founded as the SkyLine Telephone Membership Corporation on January 4, 1951, as a cooperative organization. Its purpose was to provide telephone service to every resident in Alleghany, Ashe, and Watauga counties. The Articles of Incorporation were written on December 30, 1950 [1].

21.1.2 Major Changes

On December 16, 1961, SkyLine's Board of Directors approved a merger with Cherokee Telephone Membership Corporation, adding two exchanges in Banner Elk, North Carolina, and Shady Valley, Tennessee. SkyLine moved to a new office building on Highway 193 in West Jefferson, SkyLine's current corporate office location, in April 1962. Expansion, in 1976, of the Baldwin, Creston, and Lansing Central Offices added a total of 1300 new lines and 1200 new telephone numbers during a time that the company served approximately 5,000 subscribers in Ashe County. In 1988, SkyLine began the placement of fiber-optic cable into its network. Skyline joined with three other regional telephone cooperatives to form Carolina West Cellular (now Carolina West Wireless) in 1990. SkyBest Communications, Inc., a wholly-owned subsidiary was established in 1996. SkyLine announced plans to deploy fiber-to-the-home services throughout its five-county service area during the next two decades in 2004. Digital television service

was launched in limited areas after many years of testing and field trials in July 2008. In August 2009, SkyBest introduced a new suite of state-of-the-art security systems as well as Medical Alert Monitoring for customers [1].

21.1.3 Major Accomplishments

In July 1954, SkyLine purchased the Watauga Telephone Company, thus commencing its first commercial operations. Operations began in Ashe County with the purchase of Riverside Telephone Company in September 1955. Initial dial service began on March 1957 upon the completion of the Sugar Grove exchange in Watauga County. Dial service began in Ashe County during June of the same year with the completion of the Baldwin exchange. SkyLine members were able to call residents served by Central Telephone in West Jefferson and make long distance calls for the first time in June 1957. During December 1958, SkyLine acquired Central Telephone Company's Sparta facilities which allowed SkyLine to service residents of the town. The 20,000th telephone installation was completed by SkyLine in 1978. The Board of Directors established the SkyLine Telephone Scholarship program for children of SkyLine members in 1987 with over 200 local students receiving support to further their education since that time. SkyLine introduced caller ID, call trace and call return in 1993. The cooperative became the first area business to introduce local Internet access in late 1995. In February 2006, SkyLine unveiled a new educational grant program for area public schools to increase student access to technology in the classroom. In September 2006, Skyline received the Employer Support of the Guard and Reserve's 2006 Secretary of Defense Employer Support Freedom Award. On August 26, 2010, SkyLine was the recipient of a \$28,900,000 grant from the USDA Broadband Initiatives Program as part of the American Recovery and Reinvestment Act to expand the provision of advanced fiber-to-the-premises services via a fiber-optic network in Alleghany, Ashe and Johnson counties [1].

21.2 Current Organization

21.2.1 Hierarchy

The SkyLine Board of Directors consists of R.C. Mitchell, President; Buster Burleson, Vice-President; Jimmy Blevins, CEO; Joseph McNeil, Treasurer; James L. Shepherd, Secretary; Molly Gambill, Assistant Secretary; Olan Bentley; Raymond A. Parker, II, Attorney; Jerry Roten; D.C. Smith; and Ray Ward. The SkyBest Board of Directors consists of Jimmy Blevins, President; Buster Burleson, Chairman; Dennis Gambill, Vice-President; Haskell McGuire, Secretary; R.C. Mitchell, Assistant Secretary; Joseph McNeil, Treasurer; James L. Shepherd; Sharon Kasel; and Raymond A. Parker, II, Attorney. SkyLine is a cooperative owned by its members who elect the board of directors.

SkyLine wholly owns the subsidiary SkyBest Communications, Inc. SkyLine, along with partners Wilkes Telephone and Surry Telephone, jointly own Carolina West Wireless. SkyBest Communications, Wilkes Telephone, Surry Telephone, and Carolina West Wireless own Clear Stream Communications, LLC which has a partnership with Verizon Wireless to enable 4G wireless solutions to Ashe and Alleghany counties [1].

21.2.2 Departments

The various departments in SkyLine SkyBest include Support Services, Financial Services, Field Services, Marketing, Community Relations, Engineering, and Information Technology. Support Services is further divided into Internal Support, External Support, Customer Centers, and Call Centers. Field services is composed of plant and construction. Field Services and Engineering handle construction along with Palmetto, a contractor that handles Stimulus fiber installations, to construct and maintain facilities, lines, cables, and installations. Support Services assist with any issues that may arise during installations due to software or equipment. Support Services also handles the taking and provisioning of customer orders which includes preparing the software and hardware needed to perform a successful installation. Information Technology maintains Internet connectivity, software, and hardware within the company's main offices. Technicians within Field Services and Engineering handle facilities throughout the service area such as the Central Offices that contain the equipment needed to provide phone, television, and Internet services throughout the 12 exchanges in Ashe, Alleghany, Avery, Watauga, and Shady Valley.

21.2.3 Locations

The Corporate Office and the West Jefferson Customer Service Center are both located in West Jefferson, NC. The Sparta Customer Service Center is located in Sparta, NC. The locations of the Seven Devils Customer Service Center and the Avery Retail Store are both in Banner Elk, NC. The main location for each of the departments is the Corporate Office, with specific local customer service functions being provided within each of the Customer Service Centers. A smart home / retail store that demonstrates the full array of products and services offered by SkyLine SkyBest is scheduled to be completed in West Jefferson, NC in November 2013 [2].

21.3 Functions

21.3.1 Services and Products Provided

The services that SkyLine SkyBest provide include both copper-based and fiber-optic based phone and Internet services along with digital television service through fiber-

optic based services only. These services are available to individual customers, businesses, and public facilities such as schools and hospitals. SkyLine SkyBest also provides security systems to protect against fire, theft, and other dangers as well as Medical Alert systems for customers with health concerns [2]. Smart home solutions will be available to automate home electronics including wall sockets, televisions, cameras, fans, lights, and speakers. Set-top-boxes are provided for rent to customers requesting television service. Modems are also available for rent for customers who do not own a modem of their own. SkyLine SkyBest manages a television channel on its digital television service that covers local sports such as Ashe County High School athletic events. Customer Service Centers and retail locations offer tablets, Roku streaming players, and other devices to enhance Internet and television services for customers [2].

21.3.2 Service Agreements with Other Companies

SkyLine SkyBest makes arrangements with various channel providers to include the provider's channel packages on SkyBest TV's digital television services. Verizon Wireless made an agreement that allows SkyLine to lease spectrum to provide 4G national network roaming for SkyLine's customers [1]. The cooperative has a contract with Palmetto to provide stimulus fiber-optic installations at customer locations. Local telecommunication companies, such as SkyLine, have agreements with national telephone companies to facilitate long distance calls.

21.4 Economic Status

21.4.1 Profits and Costs

Revenues for SkyLine Membership Corporation during 2010 were \$33,658,133 with expenses at \$28,773,583. While, revenues for SkyBest Communications, Inc. during 2010 were \$13,253,759 with expenses at \$13,038,011. During the previous year, revenues and expenses for SkyLine Membership Corporation were about \$2,000,000 less. This results in a general operating income of about \$5,000,000 per year. Operating incomes for large telecommunication companies tend to be near \$20,000,000 while operating incomes for smaller local telecommunication companies tend to be around \$1,000,000. All of this means that SkyLine falls into a healthy medium-to-small telecommunication income range [1].

21.4.2 Size

SkyLine had 28,323 members and 130 employees at year's end in 2009. In 2010, Skyline had 27,596 members and 133 employees. Thus, SkyLine is a relatively stable com-

pany in terms of size. SkyLine also has 32,638 total access lines which is 2ND among North Carolina Telephone Cooperatives. The SkyLine cooperative is at the upper end of small-to-medium-sized telecommunication companies [1].

21.5 Culture

21.5.1 Employee Characteristics

The average time an employee stays at SkyLine is twenty five to thirty years. This corresponds to an early turnover rate of less than 1% which is usually due to retirement. The ages of employees are distributed as follows: 4% are 20-29; 32% are 30-39; 35% are 40-49; and 29% are 50-62 [3]. The company generally consists of employees in the prime of their career. The employee culture is generally open with employees regularly sharing information and problems that they come across with one another. Business casual is the preferred dress code. Open communication between employees and superiors is encouraged.

21.5.2 Pay and Benefits

Employee pay is either hourly or salary based. The sales group has a base pay scenario plus an overall incentive payout if they meet their goals. All full-time employees are eligible for a performance bonus. Pay tends to be very competitive compared to similar positions in other businesses. SkyLine offers paid holidays, vacation leave based on time with the company, and paid sick leave after six months. There is a service award every five years of employment, a group health/dental program where 100% of the baseline premium is covered, spouse / dependent care coverage at a reduced rate, or a flex plan if the employee elects to participate in a pretax dollars plan for medical and dependent expenses. Life insurance, dependent life insurance, and business travel insurance is available to employees. Employees are also covered under long term disability and can purchase long term care insurance with SkyLine covering up to \$10 per month. A savings or 401-K plan and defined benefit retirement plans are available to SkyLine employees. Pre-retirement death benefit life insurance is provided by the cooperative. Local telephone, Internet, and DSL service is available at a discount to employees of SkyLine. Employees will be reimbursed for expenses related to tuition and books for pre-approved higher education or related education up to \$5,250 per year or employees can participate in the NTCA Educational 529 plan that utilizes payroll deductions [3].

21.5.3 Promotion Track

Promotions are available to employees who show merit. Management positions are generally offered first to current employees before being released to the public. Open positions do not come up very often due to low turnover. However, in-house promotions are encouraged and every effort is given to provide access to promotions for deserving employees.

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Chapter 22

SpaceX — Space Exploration Technologies Corporations

Nathan Hernandez

22.1 Overview

Space Exploration Technologies Corporations, or SpaceX, is a privately funded space transport company with three vehicles, a manifest of over 40, and over 3000 employees. The companys ambitions are far reaching and are hard to describe better than as it is on the company website; SpaceX designs, manufactures and launches advanced rockets and spacecraft. The company was founded in 2002 to revolutionize space technology, with the ultimate goal of enabling people to live on other planets. SpaceX holds many worlds first titles; it is the first privately held company to develop and launch into orbit a liquid fueled rocket, the first to have a private spacecraft attach itself to the international space station, and the first company to be awarded contracts by the United States Department of Defense to launch cargo into space. [4]

22.2 History

SpaceX was founded in June of 2002 by current CEO Elon Musk, who is also known for founding several other businesses: Zip2, PayPal, and Tesla Motors. As far as companies go its still young, but that hasnt had a major impact on the rate or scale of the companys accomplishments. [8]

22.2.1 Timeline

A brief history of SpaceX is highlighted below by year. [2]

22.2.1.1 2002

- June of 2002; SpaceX is founded by Elon Musk. ...

22.2.1.2 2003

- March 19th; Successful firing of the company's Falcon rocket main engine.
- December 4th; SpaceX unveils in Washington DC its Falcon orbital launch vehicle.
...

22.2.1.3 2004

- January 7th; SpaceX announces plans for the Falcon 5 launch vehicle.
- September 20th; SpaceX awarded \$8M by the Defense Advanced Research Projects Agency (DARPA) and U.S. Air Force to demonstrate highly responsive, affordable launch capability.
- October 5th; SpaceX transfers its Falcon I rocket to Vandenberg launch complex.
...

22.2.1.4 2005

- January 12th; SpaceX purchases a 10% stake in Surrey Satellite Technology Ltd.
- May 2nd; SpaceX awarded \$100 million contract by U.S. Air Force for Falcon 1.
- September 8th; SpaceX announces the Falcon 9 fully reusable heavy lift launch vehicle.
- November 18th; SpaceX announces launch date for Falcon 1, the worlds lowest cost rocket to orbit.
- December 15th; SpaceX announces launch date for Falcon 1, the worlds lowest cost rocket to orbit. ...

22.2.1.5 2006

- By 2006 Elon Musk had invested over \$100 million of his own money into SpaceX.
- August 18th; SpaceX wins NASA commercial orbital transportation contract to demonstrate cargo delivery to International Space Station. ...

22.2.1.6 2007

- April 11th; SpaceX completes primary structure of the Falcon 9 first stage tank.
- September 14th; SpaceX signs deal for first commercial geostationary satellite launch.
- November 1st; SpaceX breaks ground at Cape Canaveral's Space Launch Complex 40.
- November 13th; SpaceX completes development of Merlin regeneratively cooled rocket engine.
- December 18th; SpaceX successfully completes NASA Systems Requirements Review for Dragon spacecraft demonstration to berth at International Space Station. ...

22.2.1.7 2008

- January 18th; SpaceX conducts first multi-engine firing of Falcon 9 rocket.
- December 18th; SpaceX successfully completes NASA Systems Requirements Review for Dragon spacecraft demonstration to berth at International Space Station.
- March 10th; SpaceX signs contract with Department of Defense Falcon 1 to launch operationally responsive space satellite on next flight.
- March 27th; SpaceX conducts first three-engine firing of Falcon 9 rocket.
- April 22nd; NASA awards launch services contract to SpaceX.
- June 3rd; SpaceX conducts first five engine firing of Falcon 9 rocket.
- June 25th; SpaceX conducts static test firing of next Falcon 1 rocket.
- August 1st; SpaceX conducts full thrust firing of Falcon 9 rocket.
- August 2nd; SpaceX sets August 2nd for Falcon 1 launch.
- August 4th; SpaceX receives \$20 million investment from Founders Fund.

- September 28th; SpaceX makes history by successfully launching its Falcon 1 rocket into orbit.
- November 3rd; SpaceX introduces DragonLab spacecraft.
- November 23rd; SpaceX successfully conducts full mission-length firing of its Falcon 9 launch vehicle.
- December 2nd; SpaceX adds two DragonLab missions to manifest.
- December 9th; SpaceX Draco thruster performs long-duration firing and restart.
- December 17th; SpaceX names Gwynne Shotwell company president.
- December 23rd; NASA selects SpaceX's Falcon 9 booster and Dragon spacecraft for cargo resupply services to the International Space Station. ...

22.2.1.8 2009

- March 4th; Rob Peckham joins SpaceX as Vice President of Business Development.
- April 16th; SpaceX signs Argentina's Space Agency for two Falcon 9 launches.
- June 16th; former astronaut Bowersox joins SpaceX as Vice President of Astronaut Safety and Mission Assurance.
- July 15th; SpaceX's Falcon 1 successfully delivers RazakSAT satellite to orbit.
- August 5th; veteran aerospace leader Vander Weg joins SpaceX as Vice President of the EELV Customer Office.
- September 3rd; ORBCOMM and SpaceX reach deal to launch satellite constellation.
- September 8th; SpaceX and Astrium announce groundbreaking deal.
- September 25th; SpaceX's DragonEye navigation sensor successful demonstration on space shuttle.
- October 21st; SpaceX successfully completes first Stage 9-engine rocket firing.
- November 9th; Colonel Scott Henderson joins SpaceX to serve as the director of Mission Assurance and Integration.
- December 3rd; SpaceX hosts preliminary training for NASA ISS astronauts in preparation for Dragon spacecraft rendezvous and station berthing. ...

22.2.1.9 2010

- January 7th; SpaceX and Spacecom sign contract for Falcon 9 geosynchronous transfer mission.
- March 15th; SpaceX and Space Systems/Loral sign contract for Falcon 9 geosynchronous transfer mission.
- March 29th; SpaceX activates new communication system aboard International Space Station for control of upcoming Dragon spacecraft visits.
- June 7th; SpaceX achieves orbital bullseye with inaugural flight of Falcon 9 rocket.
- June 14th; SpaceX and The National Space Organization (NSPO) sign contract to launch earth observation satellite.
- June 16th; Iridium and SpaceX sign major commercial launch contract.
- August 20th; SpaceXs Dragon spacecraft successfully completes high altitude drop test.
- September 9th; SpaceX and EADS Astrium announce agreement to bring Falcon 1 launch capabilities to the European Institutional Market.
- November 22nd; FAA awards SpaceX first-ever commercial license to re-enter spacecraft from orbit.
- December 8th; SpaceXs Dragon spacecraft re-enters from low-Earth orbit successfully. ...

22.2.1.10 2011

- January 31st; SpaceX continues rapid growth with new office in Chantilly, Virginia.
- February 23rd; SpaceX named One of 50 Most Innovative Companies in the World by MITs Technology Review.
- March 4th; astronaut Garrett Reisman joins SpaceX as a senior engineer working on astronaut safety and mission assurance.
- March 14th; SpaceX and SES announce satellite launch agreement.
- April 5th; SpaceX announces launch date for the world's most powerful rocket: Falcon Heavy.

- April 19th; SpaceX wins NASA contract to complete development of successor to the space shuttle.
- May 11th; SpaceX names Bret Johnsen as Chief Financial Officer.
- June 13th; SpaceX secures launch contract in major Asian market.
- July 13th; SpaceX breaks ground on launch site for Falcon Heavy. . . .

22.2.1.11 2012

- February 1st; SpaceX test fires advanced new engine: SuperDraco.
- February 8th; SpaceX announces plans to launch AsiaSat 6 and AsiaSat 8 in 2014.
- March 13th; SpaceX signs launch agreements with Asia Broadcast Satellite and Satmex.
- May 10th; SpaceX and Bigelow Aerospace join forces to offer crewed missions to private space stations.
- May 22nd; SpaceX successfully launches the Falcon 9 in a historic mission to dock with the International Space Station.
- May 25th; SpaceX's Dragon becomes first commercial spacecraft to attach to the International Space Station.
- May 29th; Intelsat signs first commercial Falcon Heavy launch agreement with SpaceX.
- May 31st; the Dragon splash lands safely.
- June 25th; SpaceX's Merlin 1D engine achieves full mission duration firing.
- August 3rd; NASA selects SpaceX to return Americans to space.
- September 12th; SES and SpaceX announce contract for three satellite launches.
- September 24th; SpaceX and NASA target October 7th as launch for the first contracted U.S. cargo resupply mission to the International Space Station.
- October 7th; SpaceX launches first official cargo resupply mission to International Space Station.
- October 10th; SpaceX's Dragon successfully attaches to International Space Station.

- October 28th; SpaceXs Dragon spacecraft safely returns to Earth, completing SpaceXs first-ever cargo resupply mission to the International Space Station.
- December 5th; SpaceX awarded two EELV-Class missions from The United States Air Force. . . .

22.2.1.12 2013

- January 28th; Spacecom and SpaceX announce agreement for AMOS-6 satellite launch.
- March 1st; SpaceX achieves fifth consecutive Falcon 9 launch during second official cargo resupply mission.
- March 10th; Grasshopper completes highest leap to date.
- March 20th; SpaceX's Merlin 1D engine achieves flight qualification.
- June 21st; SpaceX will launch Turkmenistan satellite for Thales Alenia Space. . . .

22.3 Products and Services

The services that SpaceX offers are well-documented on their website; it currently provides space transportation via their Falcon 9 and Falcon Heavy rockets, thus is heavily reliant on governments and companies looking to launch satellites and other cargo into orbit. Cargo and people can be delivered into orbit using the Dragon spacecraft. SpaceX offers open and fixed pricing for its launch services. Modest discounts are available for contractually committed, multi-launch purchases. Prices shown below are paid in full standard launch prices for 2013. SpaceX can also offer crew transportation services to commercial customers seeking to transport astronauts to alternate [Low Earth Orbit] destinations. [10]

22.3.1 Dragon

The following is information detailing the Dragon from SpaceXs website. [5]

22.3.1.1 Pricing

It seems that currently the Dragon spacecraft can be used during any SpaceX flight at no additional charge to the initial launch fee. [10]

22.3.1.2 General Information

Dragon is a free-flying, reusable spacecraft designed to deliver both cargo and people to orbiting destinations. Dragon made history in 2012 when it became the first commercial spacecraft in history to deliver cargo to the International Space Station and safely return cargo to Earth, a feat previously achieved only by governments. It is the only spacecraft currently flying that is capable of returning significant amounts of cargo to Earth. Currently Dragon carries cargo to space, but it was designed from the beginning to carry humans. Under an agreement with NASA, SpaceX is now developing the refinements that will enable Dragon to fly crew. Dragon's first manned test flight is expected to take place in 2-3 years. At launch the the total payload mass can reach 6,000 kg and a total payload volume of 25 m³. Upon return the total payload mass will be as low as 3,000 kg and have a total payload volume of 11m³.

22.3.1.3 Pressurized Section

The pressurized section of the spacecraft, also referred to as the capsule, is designed to carry both cargo and humans into space. Towards the base of the capsule but outside the pressurized structure are the Draco thrusters, Dragon's guidance navigation and control (GNC) bay and Dragons advanced heat shield. The capsules payload volume is 11 m³.

22.3.1.4 Trunk

Dragons trunk supports the spacecraft during ascent to space, carries unpressurized cargo and houses Dragons solar arrays. The trunk and solar arrays remain attached to Dragon until shortly before re-entry to Earths atmosphere, when they are jettisoned. The trunk payload volume is 14 m³.

22.3.2 Falcon 9

The following is information detailing the Falcon 9 from SpaceXs website. [6]

22.3.2.1 Pricing

The Falcon 9s launch price for 2013 is set at \$56.6 million. [10]

22.3.2.2 General Information

The Falcon Nine was designed from the beginning to be fully reusable. It carries landing legs which are used to land the rocket after takeoff. The Falcon 9 is a two-stage rocket designed and manufactured by SpaceX for the reliable and safe transport of

satellites and the Dragon spacecraft into orbit. As the first rocket completely developed in the 21st century, Falcon 9 was designed from the ground up for maximum reliability. Falcon 9s simple two-stage configuration minimizes the number of separation events – and with nine first-stage engines, it can safely complete its mission even in the event of an engine shutdown.

Falcon 9 made history in 2012 when it delivered Dragon into the correct orbit for rendezvous with the International Space Station, making SpaceX the first commercial company ever to visit the station. Since then SpaceX has made a total of three flights to the space station, both delivering and returning cargo for NASA. Falcon 9, along with the Dragon spacecraft, was designed from the outset to deliver humans into space and under an agreement with NASA, SpaceX is actively working toward that goal.

22.3.2.3 First Stage

Falcon 9s first stage incorporates nine Merlin engines and aluminum-lithium alloy tanks containing liquid oxygen and rocket-grade kerosene (RP-1) propellant. After ignition, a hold-before-release system ensures that all engines are verified for full-thrust performance before the rocket is released for flight. Then, with thrust greater than five 747s at full power, the Merlin engines launch the rocket to space. Unlike airplanes, a rocket's thrust actually increases with altitude; Falcon 9 generates 1.3 million pounds of thrust at sea level but gets up to 1.5 million pounds of thrust in the vacuum of space. The first stage engines are gradually throttled near the end of first-stage flight to limit launch vehicle acceleration as the rockets mass decreases with the burning of fuel. The burn time for the nine engines is 180 seconds which provide a thrust at sea level of 5,885 kN and a thrust of 6,672 kN in vacuum.

22.3.2.4 Interstage

The interstage is a composite structure that connects the first and second stages and holds the release and separation system. Falcon 9 uses an all-pneumatic stage separation system for low-shock, highly reliable separation that can be tested on the ground, unlike pyrotechnic systems used on most launch vehicles.

22.3.2.5 Second Stage

The second stage, powered by a single Merlin vacuum engine, delivers Falcon 9s payload to the desired orbit. The second stage engine ignites a few seconds after stage separation, and can be restarted multiple times to place multiple payloads into different orbits. For maximum reliability, the second stage has redundant igniter systems. Like the first stage, the second stage is made from a high-strength aluminum-lithium

alloy. The burn time for the single second-stage engine is 375 seconds which provides a thrust of 801 kN in vacuum.

22.3.2.6 Payload

Falcon 9 delivers payloads to space aboard the Dragon spacecraft or inside a composite fairing.

22.3.2.6.1 Dragon Spacecraft Dragon carries cargo in the spacecrafts pressurized capsule and unpressurized trunk, which can also accommodate secondary payloads. In the future, Dragon will carry astronauts in the pressurized capsule as well.

22.3.2.6.2 Composite Fairing SpaceX's payload fairing, used on both Falcon Heavy and Falcon 9, is a composite structure fabricated in-house by SpaceX that protects satellites during delivery to low-Earth orbit (LEO), geosynchronous transfer orbit (GTO), and beyond. The fairing is 13.1 meters (43 feet) high and 5.2 meters (17 feet) wide. It consists of an aluminum honeycomb core with carbon-fiber face sheets fabricated in two half-shells.

After first and second stage separation and prior to second stage cutoff, the pneumatic system along the vertical seam push open for satellite deployment. The satellite is then delivered the rest of the way to orbit by the second stage, and released.

22.3.3 Falcon Heavy

The following is information detailing the Falcon Heavy from SpaceXs website.[7]

22.3.3.1 Pricing

The Falcon Heavys launch price for 2013 is set at \$77.1 million for up to 6.4 tons of geostationary transfer orbit cargo and \$135 million for cargo greater than 6.4 tons.[10]

22.3.3.2 General Information

The Falcon Heavy is the worlds most powerful rocket, a launch vehicle of scale and capability unequaled by any other currently flying. With the ability to lift into orbit over 53 metric tons (117,000 lb)—a mass equivalent to a 737 jetliner loaded with passengers, crew, luggage and fuel—Falcon Heavy can lift more than twice the payload of the next closest operational vehicle, the Delta IV Heavy, at one-third the cost. Falcon Heavy draws upon the proven heritage and reliability of Falcon 9. Its first stage is composed of three Falcon 9 nine engine cores whose 27 Merlin engines together generate nearly 4 million pounds of thrust at liftoff. Only the Saturn V moon rocket, last flown

in 1973, delivered more payload to orbit. Falcon Heavy was designed from the outset to carry humans into space and restores the possibility of flying missions with crew to the Moon or Mars.

22.3.3.3 First Stage

Three cores make up the first stage of Falcon Heavy. The side cores, or boosters, are connected at the base and at the top of the center cores liquid oxygen tank. The three cores, with a total of 27 Merlin engines, generate 17,615 kilonewtons (3.969 million pounds) of thrust at liftoff. Shortly after liftoff the center core engines are throttled down. After the side cores separate, the center core engines throttle back up to full thrust. The three cores, consisting of twenty-seven engines provides a thrust at sea level of 17,615 kN and a thrust of 20,017 kN in vacuum.

22.3.3.3.1 Boosters Each of Falcon Heavys side cores, or boosters, is equivalent to the first stage of a Falcon 9 rocket with nine Merlin engines. At liftoff, the boosters and the center core all operate at full thrust. Shortly after liftoff, the center core engines are throttled down. After the side cores separate, the center core engines throttle back up.

22.3.3.3.2 Propellant Cross-Feed System For missions involving exceptionally heavy payloads greater than 45,000 kilograms or 100,000 pounds Falcon Heavy offers a unique cross-feed propellant system. Propellant feeds from the side boosters to the center core so that the center core retains a significant amount of fuel after the boosters separate.

22.3.3.3.3 Three Nine-Engine Cores Inside each of Falcon Heavys three cores is a cluster of nine Merlin engines. These same engines power Falcon 9, enabling efficiencies that make Falcon Heavy the most cost-effective heavy-lift launch vehicle in the world. With a total of 27 first-stage engines, Falcon Heavy has engine-out capability that no other launch vehicle can match under most payload scenarios, it can sustain more than one unplanned engine shutdown at any point in flight and still successfully complete its mission.

22.3.3.4 Interstage

The interstage is identical to the Falcon 9s interstage. The interstage is a composite structure that connects the first and second stages and holds the release and separation system. [Falcon Heavy] uses an all-pneumatic stage separation system for low-shock, highly reliable separation that can be tested on the ground, unlike pyrotechnic systems used on most launch vehicles.

22.3.3.5 Second Stage

Falcon Heavy draws upon Falcon 9s proven design, which minimizes stage separation events and maximizes reliability. The second-stage Merlin engine, identical to its counterpart on Falcon 9, delivers the rockets payload to orbit after the main engines cut off and the first-stage cores separate. The engine can be restarted multiple times to place payloads into a variety of orbits including low Earth, geosynchronous transfer orbit (GTO) and geosynchronous orbit (GSO). The burn time for the single second-stage engine is 375 seconds which provides a thrust of 801 kN in vacuum.

22.3.3.6 Payload

Falcon Heavy missions will deliver large payloads to orbit inside a composite fairing, but the rocket can also carry the Dragon spacecraft.

22.3.3.6.1 Dragon Spacecraft Dragon carries cargo in the spacecrafts pressurized capsule and unpressurized trunk, which can also accommodate secondary payloads. In the future, Dragon will carry astronauts in the pressurized capsule as well.

22.3.3.6.2 Composite Fairing SpaceX's payload fairing, used on both Falcon Heavy and Falcon 9, is a composite structure fabricated in-house by SpaceX that protects satellites during delivery to low-Earth orbit (LEO), geosynchronous transfer orbit (GTO), and beyond. The fairing is 13.1 meters (43 feet) high and 5.2 meters (17 feet) wide. It consists of an aluminum honeycomb core with carbon-fiber face sheets fabricated in two half-shells.

After first and second stage separation and prior to second stage cutoff, the pneumatic system along the vertical seam push open for satellite deployment. The satellite is then delivered the rest of the way to orbit by the second stage, and released.

22.4 Business Health

It can be hard to determine just how well SpaceX is doing as a business because its still a privately owned company, but it is reported to have been profitable for the past several years. Currently the company owns three vehicles, has a manifest of over 40+ flights, and over 3,000 employees. SpaceX has contracts for flights as far into the future as 2018. SpaceXs major competitors are companies such as Virgin Galactic and Orbital Sciences. Orbital Sciences and SpaceX are both competing for major contract opportunities funded by NASA to transfer cargo to the International Space Station. In June of 2013 CEO Elon Musk stated that he did not plan on having SpaceX go public until after the Mars Colonial Transporter was flying regularly, this isnt expected to be finished for

quite some time. The reputation of SpaceX as an employer seems to vary depending on the position and person. Reviews can be found online that claim they have a high turnover rate and lie about the opportunities for advancement, others claim its one of the greatest places to work for, with plenty of opportunities for advancement if youre willing to work hard. Overall the ratings seem to be high, with employees enjoying the work they do, but working very hard.[3]

22.5 Company Culture

The company culture has been described as that of a large start-up, requiring tons of extra hours, and having a high burnout rate. The tech culture doesnt seem any different, it is likely worse. Im not sure just how many opportunities there are for growth, it seems like every employee wants, and is expected, to give 100% effort. The salary varies dramatically depending on the position, it seems like a tech-oriented job can earn one anywhere from \$50,000 to \$160,000 a year. Presumably \$50,000 would be a entry-level salary and \$160,000 a high-level job requiring several years of experience.

According to software engineers of SpaceX who did an AMA on Reddit, there are four separate software teams:[1]

1. The Flight Software team is about 35 people. We write all the code for Falcon 9, Grasshopper, and Dragon applications; and do the core platform work, also on those vehicles; we also write simulation software; test the flight code; write the communications and analysis software, deployed in our ground stations. We also work in Mission Control to support active missions.
2. The Enterprise Information Systems team builds the internal software systems that makes SpaceX run. We wear many hats, but the flagship product we develop and release is an internal web application that nearly every person in the company uses. This includes the people that are creating purchase orders and filling our part inventory, engineers creating designs and work orders with those parts, technicians on the floor clocking in and seeing what today's work will be per those designs...and literally everything in between. There are commercially available products that do this but ours kicks major ass! SpaceX is transforming from a research and engineering company into a manufacturing one - which is critical to our success - and our team is on the forefront of making that happen. We leverage C#/MVC4/EF/SQL; Javascript/Knockout/Handlebars/LESS/etc and a super sexy REST API.
3. The Ground Software team is about 9 people. We primarily code in LabVIEW. We develop the GUIs used in Mission and Launch control, for engineers and operators to monitor vehicle telemetry and command the rocket, spacecraft, and

pad support equipment. We are pushing high bandwidth data around a highly distributed system and implementing complex user interfaces with strict requirements to ensure operators can control and evaluate spacecraft in a timely manner.

4. The Avionics Test team works with the avionics hardware designers to write software for testing. We catch problems with the hardware early; when it's time for integration and testing with flight software it better be a working unit. The main objective is to write very comprehensive and robust software to be able to automate finding issues with the hardware at high volume. The software usually runs during mechanical environmental tests. . . .

22.6 Locations

Its important to first note that, due to government regulations, its very difficult to land a job with SpaceX if you are not a US citizen. There are five locations that SpaceX offers for job opportunities, all within the US: Cape Canaveral, FL; Hawthorne, CA; McGregor, TX; Vandenberg, CA; and Washington, DC. I think its very unlikely that for a job in this field you would be able to work from home; due to the nature of the work that is performed at SpaceX I believe you must necessarily be physically present at one of the various operation locations.[9]

22.7 Global Impact

SpaceX very clearly has a major global impact: socially, economically, technologically, and environmentally SpaceX has major responsibilities. SpaceX is probably as environmentally responsible as a company that has a business plan based around launching multi-ton rockets into geosynchronous orbit can be. It is the first organization to create a cheap, and fully reusable rocket ship; an impressive accomplishment considering how young SpaceX is as a company and how old the space-faring business is. Technologically SpaceX has improved space-faring capabilities on many fronts, by several folds, making space travel much cheaper than it once was, with promises to cheapen it even further. Socially SpaceX is changing the way people perceive space travel. Its hard not to be in awe and impressed with SpaceX and their far-reaching goals; time will tell if SpaceX can continue to progress at the rate it has been.

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Chapter 23

Wells Fargo Research

Chris Mitchell

23.1 History

23.1.1 Origins, Foundation, and Expansion

On March 18, 1852, Henry Wells, William Fargo and their small group of investors signed charter documents to create Wells Fargo & Company. Its mission was to provide banking and express services at the start of the Gold Rush. Wells Fargo & Company carried people, money and goods across the continent in red, horse-drawn stagecoaches from 1858 - 1869. Such a cross-country trip was a disconcerting experience as the elements and gun-slinging bandits presented a risk to the passengers' lives. An editor of the Omaha Herald chronicled the realities of hazardous overland travel in 1859: "If a team runs away, sit still and take your chances; if you jump, nine times out of ten you will be hurt. ...Be sure and take two heavy blankets; you will need them. ...Don't discuss politics or religion, nor point out places on the road where horrible murders have been committed. ...Don't grease your hair before starting or dust will stick there in sufficient quantities to make a respectable 'tater' patch." Fifteen of the passengers on the cross-country trip Wells Fargo & Co. co-founder Henry Wells took in 1853 died along the way [2].

Wells Fargo sent its business by the fastest means possible: stagecoach, steamship, railroad, pony rider or telegraph. In 1858, Wells Fargo helped start the Overland Mail Company - the famed "Butterfield Line" - to meet the demand for speedy communications across the west. In 1861, Wells Fargo also took over operations of the western leg of the famed, but short-lived, Pony Express and then in 1866, Wells Fargo combined all the major western stage lines. Stagecoaches bearing the name Wells, Fargo & Co. rolled over 3,000 miles of territory, from California to Nebraska, and from Colorado into the

mining regions of Montana and Idaho. After the completion of the transcontinental railroad in 1869, Wells Fargo increasingly rode the rails. In 1888, after expanding along the new steel network across the Northeast into New York, Wells Fargo became the country's first nationwide express company. It adopted the motto "Ocean-to-Ocean" to describe its service that connected over 2,500 communities in 25 states, and "Over-the-Seas" to highlight its lines linking America's increasingly global economy. Wells Fargo agents in towns large and small offered basic financial services like money orders, travelers checks, and transfer of funds by telegraph. By 1918 Wells Fargo was part of 10,000 communities across the country. That year, however, the federal government took over the nation's express network as part of its effort in the First World War. Wells Fargo was left with just one bank in San Francisco.

The famous image of the stagecoach and the reputation of the name saw Wells Fargo well through the mighty events and fantastic growth of the 20th Century. In prosperity, depression and war, even greater post-war prosperity, social changes and ever faster communications technologies, Wells Fargo's attention to customers' business has seen it through these monumental events and brought success. In 1905 Wells Fargo & Co's Bank of San Francisco formally separated from Wells Fargo & Co Express. The bank then survived the disaster of the 1906 San Francisco Earthquake and Fire. Afterwards, bank president I.W. Hellman confidently stated that credit would be unaffected and thus began rebuilding its banking business across the West. In the 1910s and '20s Wells Fargo served as a commercial bank in San Francisco, supporting the West's growing business and agriculture, including developing auto, aerospace and film industries. Sound management helped the bank weather the Great Depression, serve the nation during World War II, and positioned the bank to meet new consumer banking needs in the prosperous post-war era.

New banking concepts not only changed where peopled banked, but also how they banked. Drive-up teller, banking by phone, express lines, credit cards, automated teller machines and online banking are some of the innovative solutions to modern customers' needs. As in the stagecoach days, Wells Fargo has been a pioneer in bringing banking convenience to its customers. Through the 20th Century, Wells Fargo rebuilt from just one office in San Francisco. Expanding in 1923 to two marbled banking halls, Wells Fargo was a "bankers bank" that served all the west. In 1960s prosperity, Wells Fargo became a northern California regional bank with branch offices in most residential areas. In the 1980s Wells Fargo expanded into a state-wide bank and became the seventh largest bank in the nation. Shortly thereafter, the company launched its online service. In the 1990s Wells Fargo returned to its historic territory throughout the Western, Midwestern and Eastern states. Today in the 21st Century, with extensive and diversified financial services, Wells Fargo is now a globally comprehensive service provider [5].

23.1.2 Aquisitions

In October of 2008, Wachovia agreed to be purchased by Wells Fargo for roughly \$14.8 billion in an all-stock transaction. This in turn lead to a temporary injunction after Citigroup proposed that they had exclusive rights to negotiate with Wachovia regarding a purchase agreement. The injunction was eventually overturned leading to Wells Fargo's success and Citigroup's intention to seek damages of \$60 billion for the breach of their alleged exclusivity agreement with Wachovia. The acquisition of Wachovia was an enormous success [1].

23.2 Objective/Culture

Wells Fargo is a company that primarily seeks financial and revenue goals. The company believes that the key to the bottom line is the top line, that is, the ability to grow profits is consistently based on sustainable revenue growth driven by the ability to satisfy all of Wells Fargo's customers' fundamental financial needs. According to Wells Fargo, revenue growth is the most important measure of service, sales and customer satisfaction. When customers hold service at high esteem, Wells Fargo will ultimately receive more business and in turn, increased revenue. Wells Fargo maintains and measures their conservative financial position by asset quality, capital levels, lack of complexity, diversity of revenue sources and sound accounting policies. Risk is dispersed by geography, loan type, industry segment and by building risk management into every aspect of modern culture. The company aims to measure their financial success by the financial success of their customers. Financial success, in this case, is defined by the education of customers and employees to make wise financial choices. Financial education is the gateway to economic self-sufficiency and Wells Fargo provides several tools and programs to make such an education possible. In 2011 alone, more than 1,500 employees delivered 2,282 financial education lessons to 111,975 stuent and families during Teach Children to Save and Get Smart About Credit campaigns [6].

Above all else, Wells Fargo aims to acquire their customers' trust. For business customers, Wells Fargo makes it easy to manage their interest rate risks, payrolls, treasury functions, 401K plans, international operations, investments, insurance, equipment leasing, and their trustee and custodial services. Wholesale customers often place their trust in Wells Fargo when dealing with their commercial real estate, treasury management, investment banking and international banking needs. Retail bank customers often trust Wells Fargo to assist in reducing debt, increase savings, be financially secure and prepare for retirement, or in some cases consider whether to delay or redefine retirement. In a period of economic uncertainty, customers are fearful, anxious, averse to risk, and not sure whom they can trust with their money and assets. Wells Fargo hopes to improve customers' personal accountability for their own financial well-being. A customer's financial plan is molded to their needs and helps them make wise finan-

cial choices so they're "credit ready" and know when and how to move their cash into investments that are right for them [6].

23.3 Social Responsibility

Wells Fargo outlines five areas of social responsibility in which they aim to excel: ethics, products and services, community investments, team member engagement, and environmental commitment. By 2020, Wells Fargo will increase their energy efficiency by 40%, increase their waste diversion by 65% and reduce their absolute green house gas emissions by 35%, compared to 2008 levels. Over the next eight years, \$30 billion will be invested in environmentally sustainable businesses to accelerate a greener economy and provide nonprofit organizations with \$100 million to create healthier community environments and foster environmental innovations [6].

According to Tammy Phifer, a Client Service Officer for Treasury Management Services, Wells Fargo does an excellent job supporting social responsibilities. The company is involved in the American Heart Association, Domestic Violence Awareness, Susan G. Komen for the Cure, United Way, Arts and Science Council, Habitat for Humanity, and many more. Additionally, all employees are given four hours per quarter to volunteer in their communities such as schools, churches, and soup kitchens.

In illustration of their professional ethics, Wells Fargo is almost systematically obsessed with customer privacy and security of personal information. The company is highly sensitive of printing customer information and employees having cell phones or cameras in office environments. Top priorities include disposing of confidential information properly, identifying customers properly before releasing information, and being cautious not to volunteer information about a customer.

The company is interested in providing new products and services, but at the same time they don't like to take unnecessary risks. "Wells Fargo in my opinion is very low risk," says Tammy Phifer, "They would rather spend time and money in preventing loss than having the latest and greatest product." Wells Fargo offers plenty team member engagement opportunities, team member surveys, and an Idea Builder website which distributes financial rewards for the best ideas [7].

23.4 Employment

23.4.1 Common Positions

Common computer science-related positions at Wells Fargo include development programmers, business analysts, project managers, and database analysts. Due to the nature of the business, database-related positions are in high demand at Wells Fargo.

Database analysts are not expected to have any previous work experience but are expected to have an undergraduate degree related to Computer Science. Wells Fargo does not, in most cases, differentiate between a Bachelor of Arts and a Bachelor of Science degree for this position. Administrative duties are inherent but limited in a DBA position. For example, organized updating, editing, and manipulation of data is expected but for security purposes, permissions are limited to protect customer data. Further duties of a DBA involve monitoring and drawing reports. This allows Wells Fargo to keep a record of employee logins and minimize the severity of an insider threat. Furthermore, if Wells Fargo encountered an issue such as simple data corruption, a server crash, or the loss of an entire data center, a DBA would be responsible for appropriate backup and security techniques so that the problem may be remedied. When major issues such as these are not prevented, Wells Fargo typically enacts new standards requiring a significant period of adjustment. Luckily, preventative measures are so thorough that these issues can usually be rolled-back with a few clicks [3].

Among the careers offered to Computer Science undergraduates is Wells Capital Management Analyst. An aspiring Wells Capital Management Analyst will enroll in a development program and spend 24 months as a participant in one of the following three tracks: Investment Management Track, Business Management Track and Technology Track. In the Technology Track, an employee will rotate through three technology areas: Infrastructure, Data Management and Fixed Income Development. Each technology track is responsible for leveraging a wide range of technology processes to consistently meet business expectations. The assignments within cross a broad spectrum of technology activities which are required to deliver technology solutions to business problems. The Infrastructure track may involve process automation, information security and project life cycle tasks. The Data Management track may involve working with large industry standard databases to collect and distribute investment related data. The Fixed Income Development track may involve developing and/or configuring business applications for traders, portfolio managers and relationship managers. All three tracks will require working across multiple groups within both technology and business units. Through these tracks, an employee is expected to gain the necessary work experience to successfully deliver Information Technology projects for a large institutional investment management firm. In addition, the desired skill set of such an employee includes: project life cycle methodologies (Waterfall, RAD, etc.), proficiency in standard development tools like .net and java, practice working with databases including writing SQL, Batch and user interactive processing, and formal testing processes [4].

23.4.2 Benefits

Database Analysts are given varying benefits often including health, dental and vision insurance. A common Database Analyst is given a three week minimum and approxi-

mate month maximum of vacation time. In addition, a DBA has the ability to split their working hours between home and their office; however, with that freedom comes the fact that when a DBA is senior enough to be the primary (in charge) on a database, he or she is expected to be available in a worst-case situation [3]. Wells Fargo has a competitive benefits package, including health insurance, life insurance, 401K, profit sharing, paid time away, employee discounts on banking and other discounts for services like Verizon Wireless [7].

23.4.3 Upward Mobility

Wells Fargo loves to promote from within through a website called Jobs on Line which lists all positions available throughout the organization. An employee can search by a variety of criteria such as location, salary and department specialty [7]. Occasionally promotional availability is dependent on the position itself. For example, a Junior DBA may be hired with the intention of filling the role of a soon-to-retire Senior DBA [3].

23.4.4 Routine and Employee Value

Common CS-related positions such as Database Analysts or Administrators are not beholden to a particular routine. Database Analysts are provided with as much assistance as necessary but are expected to carry out their responsibilities in a timely manner. That being said, Wells Fargo also ensures their employees do not go too long without breaks. Since Wells Fargo employs support teams in various regions of the world, employees such as DBAs are not expected to work nights. This is in contrast to smaller or upstart companies in which DBAs are often expected to work several shifts. In contrast, Client Service Officers and other positions at the Customer Information Center (CIC) are held to a routine of set office hours. While management generously accommodates most employee's needs, being available for a customer is the highest priority. Practices such as these illustrate Wells Fargo's commitment to an employee's well-being. Most managers take an active interest in their team. They typically ensure their employees are aware of training and experience opportunities. Such opportunities are intended to satisfy an employee's desire to move to a new environment or promotion. It is the goal of all managers to work with their employees to help them be promoted [7][3].

23.4.5 Workplace Environment and Locations

Database Administrators and Database Analysts consistently interact with other teams because of separation of duty. DBAs typically interact with the server but such interaction is segmented due to federally regulated security purposes. In doing so, it is common for a DBA to interact with three to four departments in order to satisfy the

needs or demands of said department. In essence, a DBA acts as a window – permitting database access to underprivileged departments.

Client Service Officers and similar roles commonly interact with different departments including local and national research teams, Technical, Cash Vaults, Lockbox, and Wells Fargo Branches. While a Client Service Officer is hardly a CS-related role, the context in which it exists provides multiple insights into how a CS-related role might influence the front-end environment [3].

Both of the aforementioned positions are available at the Customer Information Center (CIC) located in Charlotte, NC. The CIC is a hub for CS-related occupations but commuters to the CIC are seriously disadvantaged as it is located in a heavily trafficked area. The CIC employs thousands of employees on any given day but those employees with a computer science background are likely to split their working hours between home and office. The Wells Capital Management Analyst Development Program extends to employees located or willing to relocate to Boston, Massachusetts; Menomonee Falls, Wisconsin; San Francisco, California or Walnut Creek, CA [4].

23.5 Development/Production

23.5.1 Future Markets

Wells Fargo aggressively pursues satisfactory technical support to customers, especially large corporate customers. These customers need tools to submit information electronically to and from the bank safely, efficiently and reliably. For this reason development is always pursuing mobile and online banking data transmission [6].

23.5.2 Target Consumers and Product Use

Anyone affiliated with Wells Fargo will benefit from the development of better products and common bank tasks such as balancing a checkbook, posting payments from a customer, depositing checks quicker and cheaper, keeping fraudsters from stealing information or money, and transferring funds from one place to another efficiently and securely. Treasury Management Product Development is seeking quality programmers to meet these goals [7].

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