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The Cloud Analysis

The Cloud Computing industry is the unseen backbone of our digital lives. Since the beginning of the COVID-19 pandemic, most students and employees have relied on video conferencing and collaborative software such as Canvas, G-Suite, Slack, Teams, and Zoom to continue their education or work from home (Gottsegen, 2019). The Cloud Computing industry grew faster in the first two months of the global pandemic than it did in two years, according to Satya Nadella (Microsoft Annual Report, 2020). This rapid growth is because the cloud offers computing services that are accessible, reliable, and scalable. The technology behind Cloud Computing's success is virtualization. Virtualization allows for efficient usage of a server's resources by enabling the creation of multiple virtual machines which have access to all of the host's resources. Furthermore, global network infrastructure and computing technology improvement are also responsible for the success of the Cloud Computing industry.

Companies like Amazon, Alibaba, Google, IBM, Microsoft, and Oracle lead the Cloud Computing industry. They have built environments that offer a large variety of services. The key categories of benefits that cloud service providers offer are Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). These services reduce overhead for developers or new and small businesses as they can rent I.T. infrastructure, development tools or host their software on the cloud to make it accessible through a web browser or phone. These companies offer their services on a pay-as-you-go or monthly fee model. These services are not limited to businesses or developers. Many of these cloud service providers also provide data storage, music streaming, collaborative and productivity software for the everyday user.

Microsoft is one of the most renowned companies globally and one of the largest cloud service providers. Microsoft headquarters is in Redmond, Washington, USA, and they currently employ 182,268 employees across 177 branches and 96 countries (Facts About Microsoft, 2021). Microsoft offers a wide selection of products and services targeting every type of customer, ranging from the average home PC user to gamers to businesses and enterprises. Microsoft's most popular and successful products are Azure Intelligent Cloud, Office 365, Surface Pro, LinkedIn, GitHub, Windows O.S., and Xbox.

In 1975, Bill Gates and Paul Allen founded Microsoft in Albuquerque, New Mexico. Allen and Gates were inspired to form their own company after creating a BASIC interpreter for Altair 8800. Microsoft's BASIC Interpreter was wildly popular and had earned Microsoft over 1 million dollars within the first two years. As the company grew along with their need for programmers, Microsoft moved to Bellevue, Washington, in 1978. In 1980, Microsoft partnered with IBM to develop an operating system for the IBM PC Model 5150 home computer. Thanks to this deal, Microsoft could dominate the home PC industry for the next two decades. In the following years, Microsoft licensed and purchased the 86-DOS operating system from SCP and then repackaged it as MS-DOS. SCP later filed a lawsuit against Microsoft, claiming the company intentionally omitted that IBM was among the earliest licensees of 86-DOS which resulted in unfair competition. Regardless, Microsoft was able to earn over 55 Million Dollars in revenue in 1983 thanks to its contract with IBM, the release of Multi-Tool Word, and Xenix OS. Microsoft's Multi-Tool Word was one of the first software programs to rely on mouse input to interact with a Graphical User Interface (GUI). Finally, in 1985, Microsoft released its first operating system with a GUI known as Windows 1.0. In the following years, Microsoft released its first Office iterations, Windows NT, Windows 95, and Internet Explorer, all of which allowed

Microsoft to continue dominating (Shah, 2020). Microsoft has always been competitive due to Bill Gates's nature, and it has continued to evolve since its inception and remained at the forefront of technology. The company's competitive nature is visible in all aspects of its business. Currently, Microsoft dominates the personal and business operating system market, and it is competing directly with Nintendo and Sony in the game console market.

Currently, Satya Nadella is the CEO of Microsoft, Scott Guthrie is Executive Vice President of Microsoft Cloud and A.I., and Rajesh Jha is Vice President of Experiences and Devices (Facts About Microsoft, 2021). Nadella received his Bachelors in Electrical Engineering from Mangalore University. Nadella also holds a Master's degree in Computer Sciences from the University of Wisconsin and a Master's degree in Business Administration from the University of Chicago. He first joined Microsoft in 1992 after leaving Sun Microsystems. Nadella quickly moved up in ranks; he led the research and development for Microsoft's online services division, then became president of server and tool business and later executive vice president of Cloud Computing platform (Satya Nadella, n.d.). Nadella is known for making Microsoft successful once again and crucial to transforming the cloud infrastructure and services business. Scott Guthrie received his Bachelors in Computer Sciences from Duke University in 1997. Guthrie started working for Microsoft immediately after graduating from Duke. He has led multiple divisions at Microsoft, such as .Net Framework Development, Silverlight, XAML, and Azure. Guthrie is currently responsible for leading the company's cloud, server, O.S., Hardware, A.I., and Businesses (Guthrie, n.d.). Lastly, Rajesh Jha received his Bachelors in Computer Science from the Indian Institute of Technology, Madras, and his Master's degree in Computer Science from the University of Massachusetts. Jha began working at Microsoft in 1990 and worked on Microsoft's clients, servers, and services division. In 2016, Jha joined senior leadership as

Executive Vice President of the Office Product Division, where he led the development and service engineering teams for Office 365. Presently, Jha leads as Vice President of Experiences and Devices (Jha, n.d.). Both Guthrie and Jha lead integral divisions of Microsoft and have significantly improved Microsoft's products and services.

In Microsoft's 2020 Annual Report, it was reported that their Intelligent cloud sector was one of the fastest-growing and largest revenue sources, followed by their Productivity and Business Processes and lastly, Personal Computing (2020). Microsoft holds the second largest market share in the Cloud Computing industry, immediately behind Amazon Web Services. Microsoft also owns LinkedIn and GitHub, which are both leaders in their respected markets. Microsoft is highly profitable and is worth over two trillion Dollars.

According to RepTrak, a company that measures corporate reputation, Microsoft ranks 9th, just below Disney on their 2021 Global RepTrak 100, which shows that customers are willing to buy from, recommend, and trust Microsoft. Furthermore, employees have rated Microsoft 34,447 times and currently have a 4.4-star rating on Glassdoor, which depicts that employees enjoy the culture and work at Microsoft (Working at Microsoft, n.d.). While Microsoft rates well with employees and customers, Microsoft has faced multiple lawsuits from its competitors for antitrust, copyright, and trademark issues. In one of the most notable cases, Microsoft spent 21 years battling a lawsuit against the U.S. government for having a monopoly and taking actions to dominate competitors like Apple, Java, and Netscape (Shah, 2020).

The Cloud Computing industry is one of the fastest growing and competitive industries in the software world. It has grown faster throughout the global COVID-19 pandemic than ever before (Aggarwal, 2021). Cloud adoption is fueled by the need for accessible, reliable, and cost-efficient solutions for continuing education and working from home. Microsoft's cloud-related

business grew by 36%, according to their 2020 annual report which is in line with the current trend in the industry (Microsoft Annual Report, 2020). Furthermore, the cloud industry is penetrating the healthcare industry as companies are helping hospitals and other health organizations optimize operations and services. Companies like Medsphere provide an electronic health record platform that provides services to manage clinical, financial, and nursing. In contrast, Carecloud's platform assists healthcare providers in connecting directly to patients (Thomas, 2019). At the forefront of Cloud Computing technology is edge computing, which is a new paradigm of computing where data is processed closest to the source. With edge computing, data is sent to the closest localized datacenter where the data is processed and sent back to the device. The primary use case for edge computing is for Internet of Things(IoT) technology.

Employers in the Cloud Computing industry seek individuals with degrees in Electrical Engineering, Software Engineering, Computer Science, and IT Professionals who have experience with Network Engineering and Systems Engineering. Individuals who have experience or degrees in these fields can fill Cloud Architect, Cloud Developer, Cloud Dev-Ops Engineer, and Cloud Data Engineer positions. These roles call for individuals who have experience designing and building applications hosted in the cloud, who understand the networking principles for creating safe and secure networks, and who are able to guide clients to picking the right services for the job.

Personally, I am interested in the Dev-Ops engineer role. I have spent a lot of time learning the philosophy and technology used by Dev-Ops engineers. Dev-Ops engineers are responsible for creating continuous integration and continuous delivery (CI/CD) pipelines, automation and optimization of workflow, and cloud/system administration. As an aspiring Dev-Ops engineer, I would need to have a solid understanding of Linux operating systems, Shell

Scripting, Networking, and Programming. My approach to entering the software industry as a Dev-Ops engineer is to acquire a Bachelor's degree in computer science first. As part of CSUMB's CS Online program, students have to take CST 334, a course on operating systems, CST 311, a course on introductory computer networking, and lastly CST 336, a course on internet programming. The previously mentioned courses are crucial and fundamental to every Dev-Ops Engineer. In CST 334, students learn about how Linux manages processes and memory as well as how to use the Linux command line to create shell scripts and to build programs that utilize GNU tools like sed and make. In CST 311 students learn the basics of computer networking and networking protocols, and in CST 336 students learn about building web apps and web APIs. Before starting my educational journey at CSUMB I had taken courses that covered web servers, Docker, and Nginx which are also important skills for a Dev-Ops engineer. Outside of school, I try to learn on my own by staying informed, connecting with the Dev-Ops Slack workspace and practicing using Dev-Ops tools on my own servers at home to prepare myself for finding an internship. Companies like Microsoft and Amazon have Dev-Ops related internships focusing on the Cloud for the upcoming summer which I hope to start applying to.

The upcoming classes will definitely prepare me to enter the industry as a well-equipped individual although I believe my self-taught skills will give me an additional edge when applying for internships and jobs. Researching the Cloud Computing industry has given me a better idea of the industry and its needs. I believe the demand for Dev-Ops engineers will also grow in the Cloud sector.

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