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ASSESSMENT 2 CASE STUDY

CLOUD COMPUTING FUNDAMENTALS

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INTRODUCTION

The main purpose of this assessment is to analyze the different scenarios that arise according to the types of service models and deployment models used or used by the companies involved to solve the different technological, financial, operational and human resource challenges they faced.

Each work case presents a final reflection where the market in general where these changes are happening and my thoughts and ideas around the implementation of the different solutions provided by cloud providers such as AWS, Google Cloud and Microsoft Azure are analyzed.

ANALYSIS OF THE CASE iRobot

IRobot is a leading global consumer robot company that designs and builds robots that empower people to do more both inside and outside the home, the company created the home-cleaning robot category with the introduction of its Roomba Vacuuming Robot.

The first Amazon Prime Day was a good one for iRobot. On that day in 2015, the company sold 14,000 of its Roomba robotic vacuums.

Roomba vacuums are popular Prime Day purchases so there are certain days, particularly after big sales events like Prime Day, when many customers send their newly purchased Roomba vacuums on their first cleaning missions, large numbers of people trying out the new connected Roomba vacuums would result in large volumes of traffic through the iRobot HOME App, the mobile app customers would be using to set up and control their connected robots

Cloud connectivity provides Roomba customers with even more convenience and control, so they can use their phones to manage their Roomba, wherever and whenever it's convenient.

iRobot began to build out its family of connected Roomba vacuums—and as the sheer number of connected customers and services quickly multiplied—iRobot recognized it needed a solution that could scale more quickly and allowed for more direct control.

ANALYSING THE SERVICE MODEL FOR THE CASE STUDY INCLUDING THE SERVICES BY THE PROVIDER AND EACH SCENARIO UTILISED

IAAS

The iRobot company requires a solution that helps it support the operation at times when consumers connect to the application to access the Roomba devices, in the same way it is required to make resource management more efficient in order to make the costs related to maintenance and use of own infrastructure. For this reason, with the solution provided by AWS, the responsible team will be only 10 people in charge of handling everything related to technology.

	Public	Private	Hybrid	Community
Used in the case study	YES	NO	NO	NO
Reason	-Lower costs -Minimum maintenance -Near unlimited scalability -Resource optimization			

ANALYSE THE APPLICATION OF DIFFERENT SERVICES EACH CASE STUDY USED

AWS Lambda-. Runs code in response to events to provide function-based compute services for the serverless backend that powers the iRobot cloud application.

AWS IOT-. Platform powerful enough to process information from millions of devices connected to the IOT.

Amazon Kinesis -. Used to receive all the information generated by the robots in real time that can be used by different areas of the company to create different types of strategies.

REFLECTION

The use of devices connected to the Internet has been increasing considerably over the years. Today practically everything makes use of this technology in order to amplify its advantages and offer additional services. The company iRobot has been able to make use of this trend with the implementation of this technology in its products, which fit perfectly with the desired uses.

In this scenario, it can be seen how the different product marketing channels can influence the company's operational strategy. When offering products through marketplaces and various electronic stores, it is easy to predict peaks in the use of the company's application to a certain extent, since promotions or holidays such as Black Friday or Prime Day tend to attract more buyers than usual.

The AWS Cloud platform fits perfectly with companies like iRobot that have products that can be connected to the internet and powered by IOT services. Being able to offer our clients a product that is easily manipulated through our telephone, and that, on the company's side, can help us to know all the operational details perfectly, multiplies and increases the efficiency that is sought.

The approach that the company adopts in relation to the present and future of connected devices and especially to the vision they have of creating a completely connected home is extremely interesting. Personally, I believe that homes are already in this transition, especially due to the great popularity that devices such as Alexa or Google Home have acquired, although I believe that we will have to wait several years until we can see the complete automation and robotization of the homes of the future.

ANALYSIS OF CASE 3M

3M Health Information Systems, based in Salt Lake City, Utah, is one of the world's largest providers of software for the healthcare industry.

Its software applications benefit different actors within the health sector including patients, providers and payers, all this through systems that help those involved to interact with each other avoiding technical frictions.

Part of the solution uses natural-language processing to automatically create medical codes, which are critical to both clinicians and the business of healthcare delivery. Providers use the software solutions to efficiently manage revenue-cycle operations but can also use the results to identify deficiencies in clinical documentation and automatically recommend measures to eliminate them.

Previously, 3M HIS relied on multiple IT centers and developed environments to support its software solutions.

Within the daily operation of 3M HIS, there were times of the day when it was necessary to increase the computing and storage capacity to meet the needs of the different stakeholders. Computer services were required practically all day, however, during the remaining time, the use that was given was minimal, but even so, they had to continue carrying out maintenance tasks for the operation and the payment that this involves.

Being a data analytics company requires a flexible and agile mindset that adapts to the daily needs of customers. The virtual hardware platforms of multiple projects can share the same set of hardware resources, thus through integrating the development test project, the hardware investment will be greatly reduced. Furht, B. (2010).This means deploying applications at the right time. with the highest quality and under a safe environment that reduces friction between researchers, scientists and developers.

3M Health Information Systems determined that moving to the cloud was the best way to address its challenges. After choosing AWS, 3M HIS began migrating several important applications to the AWS Cloud.

Employing a multi-cloud strategy and hosting some applications in other data centers, it plans to rely more on AWS in the coming months.

ANALYSING THE SERVICE MODEL FOR THE CASE STUDY INCLUDING THE SERVICES BY THE PROVIDER AND EACH SCENARIO UTILISED

IAAS

The 3M company is dedicated to the commercialization of health data through its technological solutions that unite the different characters involved in the market. For this reason, a cloud solution that reinforces and expands the technological capacity of these services is vital for the company. An IaaS solution in which the technological infrastructure is managed virtually by third parties to avoid costs is the most viable and intelligent option.

	Public	Private	Hybrid	Community
Used in the case study	NO	NO	YES	NO
Reason			Security Scalability Deployment speed Testing capabilities	

ANALYSE THE APPLICATION OF DIFFERENT SERVICES EACH CASE STUDY USED

AWS Professional Services-. Global team of experts that can help you realize your desired business outcomes when using the AWS Cloud.

Amazon Elastic Compute Cloud-. Offers the broadest and deepest compute platform, with over 500 instances and choice of the latest processor, storage, networking, operating system, and purchase model to help clients best match the needs of their workload.

Amazon Simple Storage Service-. Object storage service that stores data as objects within buckets. An object is a file and any metadata that describes the file.

Amazon Relational Database Service-. Simplify the setup, operation, and scaling of a relational database for use in applications.

Code Commit-. Secure, highly scalable, managed source control service that hosts private Git repositories. It makes it easy for teams to securely collaborate on code with contributions encrypted in transit and at rest.

AWS CodePipeline-. Continuous delivery service that helps to automate release pipelines for fast and reliable applications.

AWS Cloud Formation-. Infrastructure as code service that allows to easily model, provision, and manage AWS and third-party resources.

AWS Identity and Access Management-. Provides fine-grained access control across all of AWS.

REFLECTION

When it comes to data, healthcare companies like 3M have very specific needs. Firstly, they must comply with ever-changing regulations regarding patient information. Secondly, they must work with very sensitive data, such as medical histories and other protected information. Thirdly, they have very high operational costs because they must have many servers dedicated to data storage. Finally, they must keep data secure to protect patient information.

The amount of data is immense, and it uses varied, it helps businesses to improve their products and services, target advertising, and make strategic decisions. Data is also helpful in increasing customer engagement, reducing operational costs, and mitigating risk. The main problem is that because the idea of networking appliances and other objects is relatively new, security has not always been considered in product design. Stergiou, C., Psannis, K. E., Kim, B. G., & Gupta, B. (2018).

Previously, 3M used its own infrastructure to take over the technology operation of the company, however the spikes in usage and the maintenance required around the network made it impractical and inefficient.

The transition to the cloud through the help of AWS professionals represented a great competitive advantage that is reflected in the current processes, which allow greater speed and flexibility at an adequate cost, characteristics that the company needs to continue satisfying its clients.

ANALYSIS OF THE CASE DAIMLER

Daimler AG is digitally transforming its business, from vehicle design to core business systems, using the cloud. Daimler replaced its companywide procurement system with a software as a service system running in Microsoft Azure.

Launching Azure-based connected car, truck, and van projects to outfit its vehicles with Internet of Things (IoT) intelligence and remote monitoring capabilities, Daimler is moving the company's core operational systems to Azure.

Contract management is at the forefront of procurement transformation, for this reason Daimler chose the Icertis Contract Management (ICM) platform, Icertis runs its solutions in Azure.

Icertis developed ICM in Azure and hosts it there using a software as a service (SaaS) model and multiple Azure infrastructure and platform services, for the remaining NPS functionality, Daimler chose to use a suite of SAP products.

In moments of peak functionality and robustness —such as year-end supplier contract renewals -it was decided to put the rest of NPS in Azure,

Daimler engaged the help of a global services integrator- Infosys- to deploy, test, and move into production the large, complex NPS infrastructure and to provide managed services for the application once operational. Azure was used to transform a key operational system many months faster than it would have been using traditional on-premises methods. The new system is easier to maintain and extend with new functionalities and capabilities.

Daimler is not only moving faster but saving money in Azure, it is estimated that the company's hardware costs have dropped by about 40 percent and that IT operational costs for managing NPS are about 50 percent less than for managing the previous system.

ANALYSING THE SERVICE MODEL FOR THE CASE STUDY INCLUDING THE SERVICES BY THE PROVIDER AND EACH SCENARIO UTILISED

SAAS

In this case study SaaS is used and provided by Microsoft Azure, the company requires a Saas solution that is accessible in a simple and reliable way without additional infrastructure services.

	Public	Private	Hybrid	Community
Used in the case study	NO	YES	NO	NO
Reason		Velocity Scalability Networking Cost savings		

ANALYSE THE APPLICATION OF DIFFERENT SERVICES EACH CASE STUDY USED

Azure Virtual Machines-. It uses virtual machine scale sets to build scalable applications.

Azure SQL Database-. Relational database service built for the cloud.

Azure Active Directory-. Cloud-based identity and access management service.

Azure Machine Learning services-. Collection of services and tools intended to help developers train and deploy machine learning models.

Azure VPN Gateway-. Sends encrypted traffic between an Azure virtual network and an on-premises location over the public Internet.

Azure Service Bus-. Cloud messaging system for connecting apps and devices across public and private clouds.

Azure Site Recovery-. Help businesses to keep doing business even during major IT outages

Microsoft Cognitive Services- Brings AI within reach of every developer and data scientist.

Azure Bot Service-. Manage, connect, and deploy enterprise-grade conversational AI bots across devices.

REFLECTION

The car industry is expected to shift towards cloud-based software in the next few years. With the emergence of technologies such as 5G, there will be more bandwidth, reduced latency, and quicker response times, which will be crucial for connected cars. With the cloud, car manufacturers can have secure and scalable software to power their connected cars, which will allow them to bring new products to the market faster. At the same time, car owners can expect connected car software that is updated remotely and works with their current model.

Daimler, being a global company, knows that there are many competitors trying to enter the automotive business, focusing mainly on autonomous vehicles. For this reason, the company has adopted a strategy focused on cloud services that makes all its products, services and operations are more determined and effective.

By partnering with Microsoft Azure and making use of its services, Daimler lays the groundwork to be at the forefront of this very crowded industry. Initially with the migration of its procurement services, it is about streamlining the processes that involve stakeholders, mainly suppliers, in order to be more agile and flexible than other industry participants.

The benefits are not only concentrated in the development of services and products, a large part can also be seen in the costs associated with infrastructure maintenance, which according to executives have dropped by around 40%.

ANALYSIS OF THE CASE PAYPAL

PayPal has over 377 million active accounts in 200 global markets what makes it one of the most important financial platforms in the world, all this generated thanks to its strong technological culture using its own infrastructure and third-party networks.

Recently, the company has leaned towards a cloud-based transactions strategy, which is why it has started migrating its applications to the cloud, choosing Google Cloud as a provider.

The series of events that have occurred since 2020 have led the company to accelerate its strategy, which is why it has relied on Deloitte to help it define and execute a multi-year strategy that does not depend on its own technological infrastructure.

Among the benefits that Google Cloud offers is access to lower latency, enhanced scalability, and better end-user customer experiences.

Previously, when PayPal handled all its infrastructure related to its operation, it had to build onto its infrastructure to prepare for peak transaction load and always maintain it, for example, on days like Black Friday or Cyber Monday, the company processed 1,000 payments per second. Google's cloud platform helped manage these high-traffic events by staggering workloads while also scaling up or down to manage off-peak times effectively.

Now, PayPal can quickly adjust without the cost of continually maintaining that infrastructure. In fact, the company experienced significant savings during the 2020 holiday season by utilizing Google Cloud. Nowadays, approximately 20% of PayPal’s core infrastructure is now on Google Cloud, with plans to increase it more.

ANALYSING THE SERVICE MODEL FOR THE CASE STUDY INCLUDING THE SERVICES BY THE PROVIDER AND EACH SCENARIO UTILISED

IaaS service provided by Google Cloud, where, according to the company's policies, they want to have a company that is zero dependent on their own data centers, for which an entire infrastructure is required that is outsourced and managed by a third party.

	Public	Private	Hybrid	Community
Used in the case study	NO	NO	YES	NO
Reason			Access to data anywhere Flexibility Migration in progress	

ANALYSE THE APPLICATION OF DIFFERENT SERVICES EACH CASE STUDY USED

Open Banking APIs -. Simplify and accelerate secure delivery of open banking compliant APIs

High Performance computing for risk simulation -. A flexible and powerful infrastructure that clears the way for innovation

High Performance computing for quantitive analysis-. Google Cloud gives quantitative analysts and researchers the scale and speed they need to convert ideas into profitable strategies easily.

Regulatory reporting-. The regulatory reporting framework can produce reliable reports in minutes rather than weeks in a highly cost-effective manner.

REFLECTION

The financial services industry has seen an increase in the adoption of technology, which has led to the emergence of fintech, the sector is characterized by a high level of technological advancement, especially in the fields of artificial intelligence and big data. Investment in these technologies has led to an increase in investments in fintech, resulting in exponential growth of this sector as a whole.

Cloud computing provides an environment where data is stored in the CSP's site, and manage it by the CSP or third party. Namasudra, S. (2018). Over the years, fintech has undergone an evolution and has become more sophisticated and has greater implications for the industry. At present, there are several fintech trends that are shaping the future of the financial services industry. For this reason, PayPal is dedicated to transforming the financial services industry by bringing products to market that focus on ease of use and adoption by all socioeconomic groups.

It is important to highlight that in this specific scenario the company PayPal received technical assistance from the consulting company Deloitte which together with Google oversaw facilitating the process of design, execution and migration of the company to the Cloud trying to reach the goal of being a company without its own data centers.

Currently, approximately 20% of Paypal's infrastructure is in Google Cloud, which reflects the size of the operation that needs to be carried out in order to meet the objectives set by the company.

CONCLUSION

The importance that the cloud services industry has gained over time is remarkable. Despite being a relatively young industry, it has been consolidating and diversifying, becoming a key aspect for the operation of many companies that were born from it.

The variety of applications offered by companies such as AWS, Microsoft Azure or Google Cloud, allow companies that use them to take a leap in quality in terms of effectiveness, scalability and productivity.

In this work it was possible to appreciate how different companies dedicated to different commercial activities make use of these technologies to enhance each of the areas of the organization regardless of its scale or size. The approach given by each company will depend on the interests, the infrastructure, the competition and the type of product or service that is being marketed.

My previous knowledge of the cloud was not limited but I consider it did not have the necessary depth to be able to identify the immense number of uses that can be given to it, practically any area of the company can be positively impacted by the benefits that the services in the cloud offer, making this a determining tool when competing in the modern business world.

The increasing adoption of cloud-based applications such as collaboration software and ERP systems, alongside the fact that businesses are now more comfortable with the security of the cloud, is expected to drive the growth of cloud-based services. Therefore, it is crucial that businesses start exploring the benefits of cloud computing and start migrating their workloads to the cloud as soon as possible.

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