THE SPARKS FOUNDATION

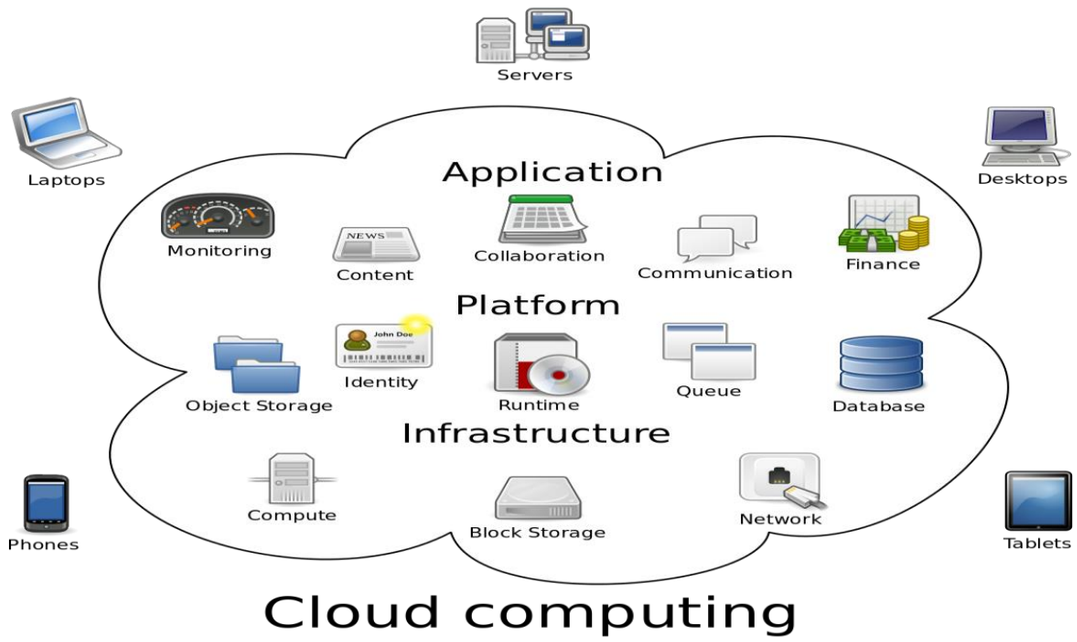
WEB DEVELOPMENT INTERNSHIP REPORT

TOPIC:

COMPARATIVE STUDY OF VARIOUS CLOUD INITIATIVES

BY:

NIVI PATODI



INTRODUCTION :

This report will help you understand different Cloud platforms with respect to their :

- Availability Zone
- Market Share
- Services
- Pricing
- Storage
- Popularity

AWS, Azure, and Google Cloud Platform stand out proudly as the top three cloud providers.

What is cloud computing, in simple terms?

Cloud computing is the delivery of different services through the Internet. These resources include tools and applications like data storage, servers, databases, networking, and software.

Instead of buying, owning, and maintaining physical data centres and servers, you can access technology services, such as computing power, storage, and databases, on an as-needed basis from a cloud provider like Amazon Web Services (AWS). It is helpful in different online services like online banking, social media networking, online shopping portals, Google drive, etc.

Practical Uses of Cloud Computing: Organizations of every type, size, and industry are using the cloud for a wide variety of use cases, such as data backup, disaster recovery, email, virtual desktops, software development and testing, big data analytics, and customer-facing web applications. For example, healthcare companies are using the cloud to develop more personalized treatments for patients. Financial services companies are using the cloud to power real-time fraud detection and prevention. And video game makers are using the cloud to deliver online games to millions of players around the world.

How does cloud computing work?

Rather than owning their own computing infrastructure or data centers, companies can rent access to anything from applications to storage from a cloud service provide .One benefit of using cloud computing services is that firms can avoid the upfront cost and complexity of owning and maintaining their own IT infrastructure, and instead simply pay for what they use, when they use it.

Now let us discuss few benefits of Cloud Computing. There are many benefits to moving your business to the cloud:

- Reduced IT Cost
- Scalability
- Business Continuity
- Collaboration Efficiency
- Flexibility of work practices

Now coming to our main topic of discussions we hereby discuss the major and most used Cloud Platforms which are:

- **AWS(Amazon Web Services)**
- **Microsoft Azure**
- **GCP(Google Cloud Platform)**

• AWS(Amazon Web Services)

Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud platform, offering over 175 fully featured services from data centers globally. Millions of customers—including the fastest-growing startups, largest enterprises, and leading government agencies—are using AWS to lower costs, become more agile, and innovate faster.

It is the best example of evolving cloud platform provided by Amazon .It Includes SaaS (Software as a service)

, IaaS(Infrastructure as a service) and PaaS(Platform as a service) , all these services acts as the working framework for AWS.

- One of AWS services is Amazon Elastic Compute Cloud (EC2), which allows users to have at their disposal a virtual cluster of computers, available all the time, through the Internet. It also provides storage with ec2 instances.
- S3 (Simple Storage Service) — Storage service of AWS in which we can store objects like files, folders, images, documents, songs, etc. It cannot be used to install software, games or Operating System.
- AWS includes various tools and services designed to help users migrate applications, databases, servers and data onto its public cloud.
  AWS also provides you with developer tools, Management and monitoring, Security and governance, analytics, AI, app development and many more services.

- **Microsoft Azure**

Azure is Microsoft's cloud platform, through which we can use Microsoft's resource. Microsoft Azure provides us with virtual machines, fast processing of data, analytical and monitoring tools and so on to make our work simpler. The pricing of Azure is also simpler and cost-effective. Popularly termed as "Pay As You Go", which means how much you use, pay only for that.

Microsoft Azure is getting bigger and better in coming days. More tools and more functionality are getting added. It has two releases as of now. Its famous version Microsoft Azure v1 and later Microsoft Azure v2. Azure includes Virtual Machines, Virtual Machine Scale Sets, Functions for server less computing, Batch for containerized batch workloads, Service

Fabric for micro services and container orchestration, and Cloud Services for building cloud-based apps and APIs.

The Azure Service Platform is comprised of three cloud centric products: Windows Azure, SQL Azure and Azure App Fabric controller. These are in addition to the application hosting infrastructure facility.

- **GCP (Google Cloud Platform)**

Google Cloud is a suite of Cloud Computing services offered by Google. The platform provides various services like compute, storage, networking, Big Data, and many more that run on the same infrastructure that Google uses internally for its end users like Google Search and YouTube.

Google server hasn't gone down in years. So, if you are planning to run your application on the Google Cloud infrastructure, then you can be assured of your applications being safe and secure.

Google Cloud has been one of the top cloud providers in the IT industry. The services they offer can be accessed by software developers, as it provides a reliable and highly scalable infrastructure to build, test, and deploy their applications.

GCP provides a numerous features like other cloud services like :
Compute Services, Storage Services, Networking, Big Data Services, Security and Identity Management, Management Tools, Cloud AI,etc.

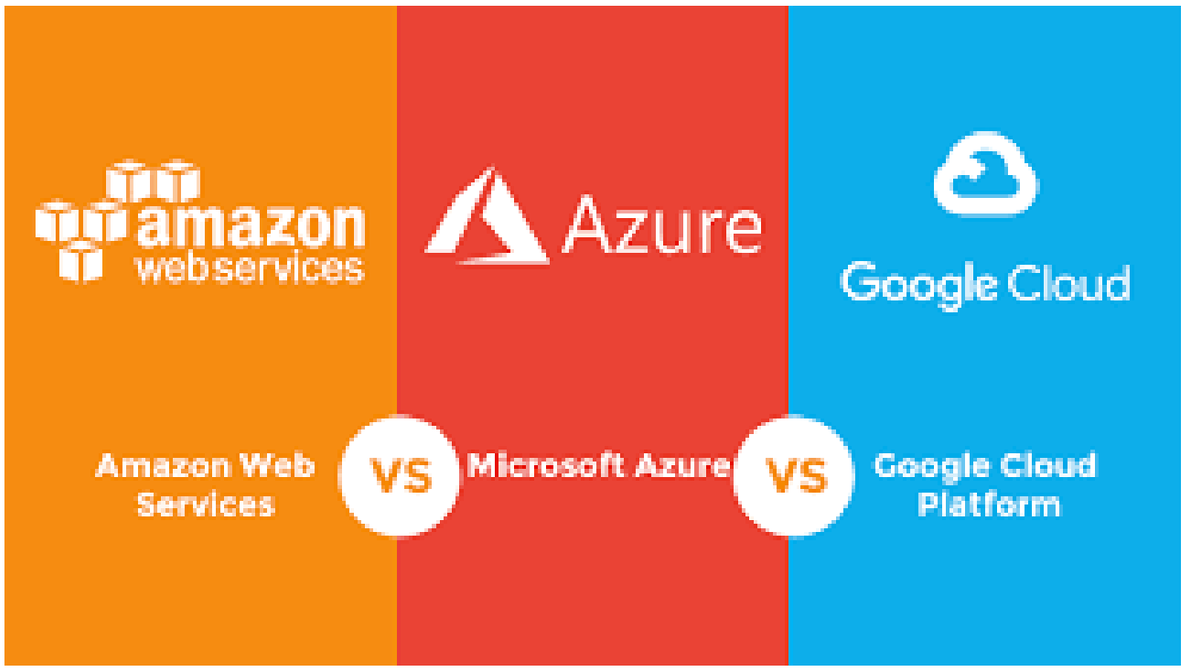
Google uses Platform as a Service to deploy Java, PHP, and other applications.

It provides online file storage web service for storing and accessing data.

It uses VPC (Virtual Private Cloud) ,CLB(Cloud Load Balancing) and CDN(Content Delivery Network for IP allocation , routing, distributing workloads on different users, etc. Cloud IOT Core allows you to easily and securely connect, manage, and ingest data from devices that are connected to the Internet.

Now comes the Final point who wins the Race :

Is it AWS, Azure or GCP , Lets evaluate each taking different parameters as a cloud platform.



- **Availability Zone**

It has been already established that AWS was the earliest in the cloud domain which means that they have had more time to establish and expand their network. So, AWS is hosting in multiple locations worldwide. Azure and GCP are also hosting in multiple locations worldwide, but the difference occurs in the number of their respective availability zones.

- AWS has 66 availability zones with 12 more on the way.
- Azure has 54 regions worldwide and is available in 140 countries all around the world.
- Google Cloud Platform has been made available in 20 regions around the world with 3 more on their way.

- ## Market Share

AWS is leading with around 30 percent of public cloud share in its name.

Microsoft Azure is on the second place, owning around 16 percent of the worldwide market share.

Google, on the third place, owns up to 10 percent of the market share worldwide.

- ## Services

With the added advantage of five years of head start, AWS computing services are by far the most evolved and functionally rich.
IaaS- AWS uses Elastic Compute Cloud on the other hand Azure uses Virtual Machines and lastly GCP uses Google Compute engine.
PaaS- Elastic Beanstalk is used by AWS, Azure makes use of App Service and Cloud Services and last Google App Engine is used by GCP for PaaS services.

- ## Pricing

AWS and Azure have almost same pricing due to same free tier offerings and additional pricings.
Google Cloud Functions comes out as the cheapest provider for server less computing due to its very low compute price ($0.0000025) compare to AWS and Azure.
AWS and Azure have almost 6 times higher pricing than Google.

- ## Storage

  - AWS offers a long list of storage services that includes its Simple Storage Service (S3) for object storage, Elastic Block Storage (EBS) for persistent block storage for use with EC2, and Elastic File System (EFS) for file storage.
  - Microsoft Azure's basic storage services include Blob Storage , Queue Storage File Storage and Disk Storage

- ❖ GCP has a smaller menu of storage services available.

- **<u>Popularity</u>**

AWS is leading with around 30 percent of public cloud share ,on second place it comes Azure which owns 16 percent of worldwide market share and then comes GCP which owns 10 percent of market share worldwide.

- ✓ **So after discussing different parameters and comparing each cloud platform we can surely conclude that AWS stands out to be the top cloud platform among the three based on several discussed factors.**

- ✓ **Even though the other two cloud platforms are gaining a good response with growing needs and services of Cloud Computing**.

- ✓ **Looking at the public cloud industry, both earning announcements earlier this year from Microsoft and AWS demonstrate that cloud services are growing and most importantly, profitable.**