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Cloud Computing: A Modern Technology and Its Applications

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Abstract: *Cloud computing is a modern technology that enables users to access computing resources such as storage, servers, databases, and applications over the internet. It provides flexibility, scalability, and cost efficiency. This paper presents the concept, characteristics, types, advantages, challenges, and future scope of cloud computing. The study highlights the importance of cloud technology in various sectors such as education, business, healthcare, and banking.*

Keywords: Cloud Computing, IaaS, PaaS, SaaS, Virtualization, Data Storage

I. INTRODUCTION

In today's digital era, the demand for efficient data storage and processing has increased significantly. Traditional computing systems require high investment in hardware and maintenance. Cloud computing has emerged as an effective solution by providing on-demand computing services over the internet. It allows users to store and access data remotely, reducing infrastructure costs and improving accessibility.

II. LITERATURE REVIEW

Previous studies have identified cloud computing as a scalable and cost-effective technology. Researchers have emphasized its role in reducing IT costs and improving performance. However, concerns related to data security, privacy, and vendor lock-in have also been discussed. These studies highlight the need for secure and efficient cloud adoption strategies..

III. CONCEPT OF CLOUD COMPUTING

Cloud computing refers to the delivery of computing services such as servers, storage, databases, networking, and software over the internet. It follows a pay-as-you-go model, allowing users to pay only for the services they use.

IV . CHARACTERISTICS OF CLOUD COMPUTING

- On-demand self-service: Users can access resources without human interaction
- Broad network access: Services are available over the internet
- Resource pooling: Resources are shared among multiple users
- Rapid elasticity: Resources can be scaled easily
- Measured service: Usage is monitored and billed accordingly

V. TYPES OF CLOUD COMPUTING

5.1 Public Cloud Services are available to the public over the internet
5.2 Private Cloud Used by a single organization with higher security
5.3 Hybrid Cloud Combination of public and private cloud

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VI. SERVICE MODELS

- IaaS – Provides infrastructure like servers and storage
- PaaS – Provides platform for application development
- SaaS – Provides software through internet

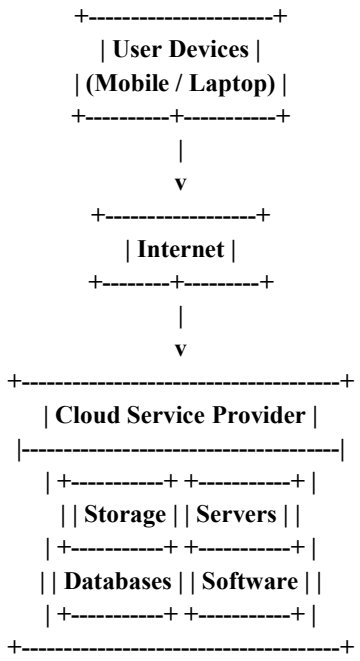

Figure 1: Cloud Computing Architecture

Explanation:
This diagram illustrates how users access cloud services through the internet. The cloud provider manages storage, servers, databases, and software, which are remotely accessible.

VII. ADVANTAGES

- Cost efficiency
- Scalability
- Remote accessibility
- Data backup and recovery
- Collaboration

VIII. DISADVANTAGES

- Security risks
- Internet dependency
- Limited control
- Downtime issues

IX. APPLICATIONS

- Education (E-learning)

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- Business (CRM, ERP)
- Healthcare (Patient records)
- Banking (Online transactions)

X. CHALLENGES

- Data security and privacy
- Vendor lock-in
- Network latency
- Compliance issues

XI. FUTURE SCOPE

Cloud computing is expected to grow rapidly with the integration of Artificial Intelligence (AI), Machine Learning (ML), and Internet of Things (IoT). Technologies like serverless computing and edge computing will further enhance cloud capabilities.

XII. CONCLUSION

Cloud computing has transformed the way data is stored and accessed. It offers scalable, flexible, and cost-effective solutions. Despite some challenges, continuous advancements are improving its security and performance, making it a key technology for future development.

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