

Comprehensive Study on Cloud Computing Services and their Implications for Businesses and Industries

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ABSTRACT: A review of the literature on cloud computing is conducted in this work. With its advantages for many kinds of enterprises, cloud computing is one of the computer industry's fastest-growing technologies. Since cloud computing entered the marketplace, service providers have developed a variety of amenities and made them accessible to potential clients. This paper presents the service model for cloud computing. In particular, Platform as a Service (PaaS), Software as a Service (SaaS), and Infrastructure as a Service (IaaS). The study used a mixed research methodology. It entails compiling and assessing both quantitative and qualitative data from the identical literature review and combining the findings of previous, relevant studies. Results introduce readers to the difficulties and issues related to cloud computing while highlighting the trends in cloud computing both now and in the future. The literature study indicated that the use of technology is projected to increase in the future and shows promise. Researchers to solve the issues and difficulties associated with cloud computing, including privacy and security threats, mobile cloud computing, and cloud computing governance.

Keywords—*Cloud Computing Services, Cloud providers.*

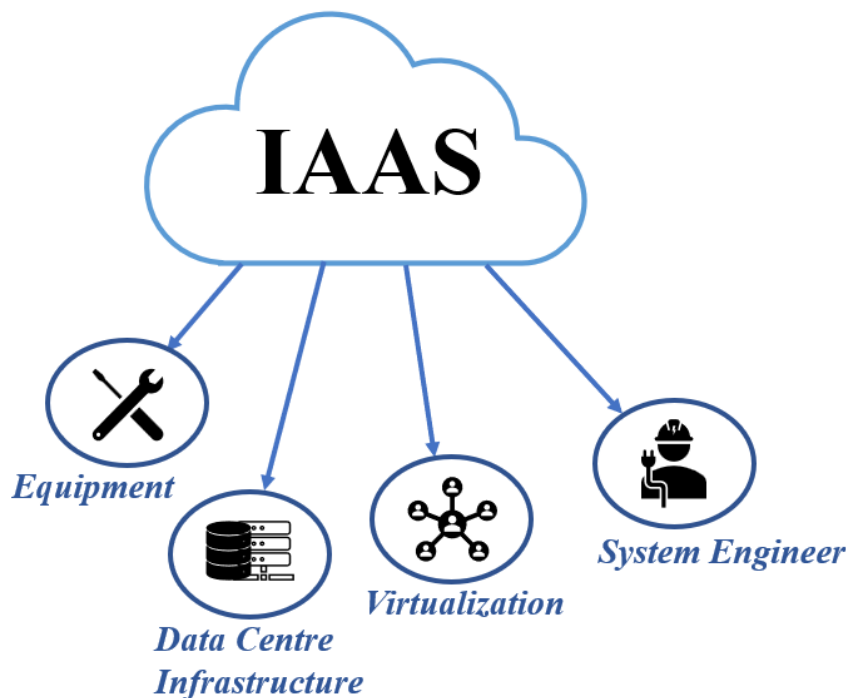
I. INTRODUCTION

The introduction compares the word "cloud" in the computing industry to actual clouds, which are collections of water molecules. [6]. The cloud computing system is a computerization technique that enables the creation, configuration, and customization of applications using the internet. A computing model known as "cloud computing" is defined as providing scale IT skills as services that are accessible to a variety of users. It includes using technologies based on the Internet to deliver a range of services, including components, computing power, preservation, and business applications[7]. The ubiquity of the internet has considerably aided in the easy accessibility of computing resources. One of the main components that makes cloud computing possible is the internet's ability to connect[4]. Cloud computing is distinctive in several excellent features like Effectiveness in scaling as needed delivery of services, high efficiency, reliability, available-for-purchase policy, flexibility, productivity, and resource movement[1]. Cloud computing provides universal, appropriate, and instant access to all a cloud system's hardware and software processing resources over computer networks.[2] Estimated to include specifics on the principal cloud service models, such as Platform as a Service (PaaS), software as a Service (SaaS), and Infrastructure as a Service (IaaS). It is possible to look at the anticipated cloud computing system's benefits and any potential downsides.[8]

II. THREE TYPICAL MODELS FOR CLOUD SERVICES:

1. The basic infrastructure for running applications and workloads in the cloud is called Infrastructure as a Service (IaaS)[10]. It provides on-demand access to networking, storage, and servers that are hosted in the cloud, both physically and virtually. It provides complete authority over the hardware (servers, virtual machines, storage, networks, and operating systems) that powers your application. Some benefits of IaaS. [11]

- Increased accessibility
- Enhanced reactivity
- Better performance and reduced latency
- All-encompassing security
- quicker access to cutting-edge technology [10]

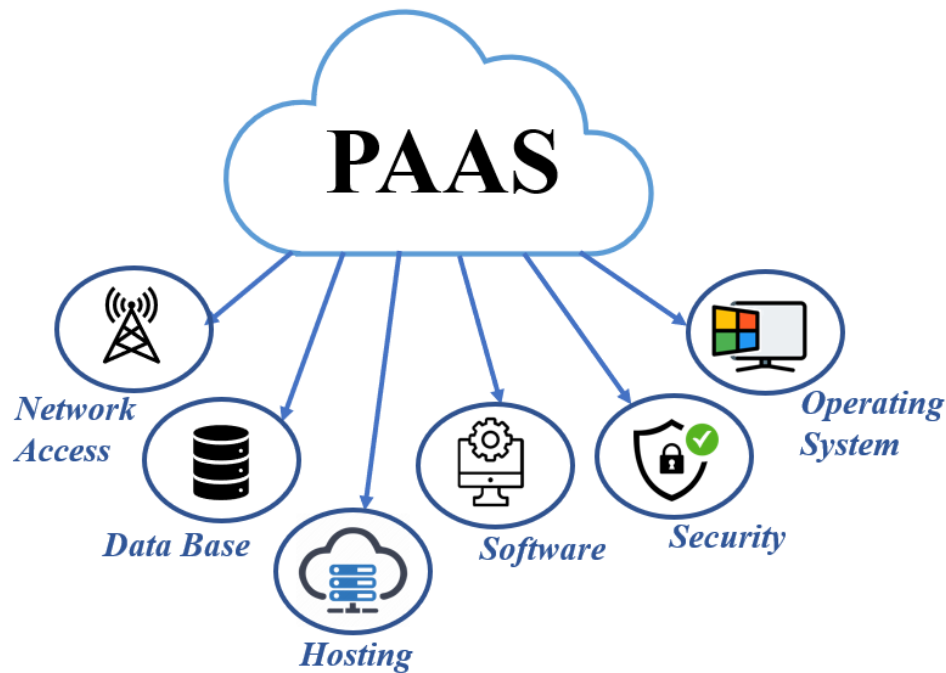


[11]

2. Platform as a service (PaaS) is the availability of a fully functional, prepared cloud-hosted platform for creating, executing, managing, and maintaining software on service [10].

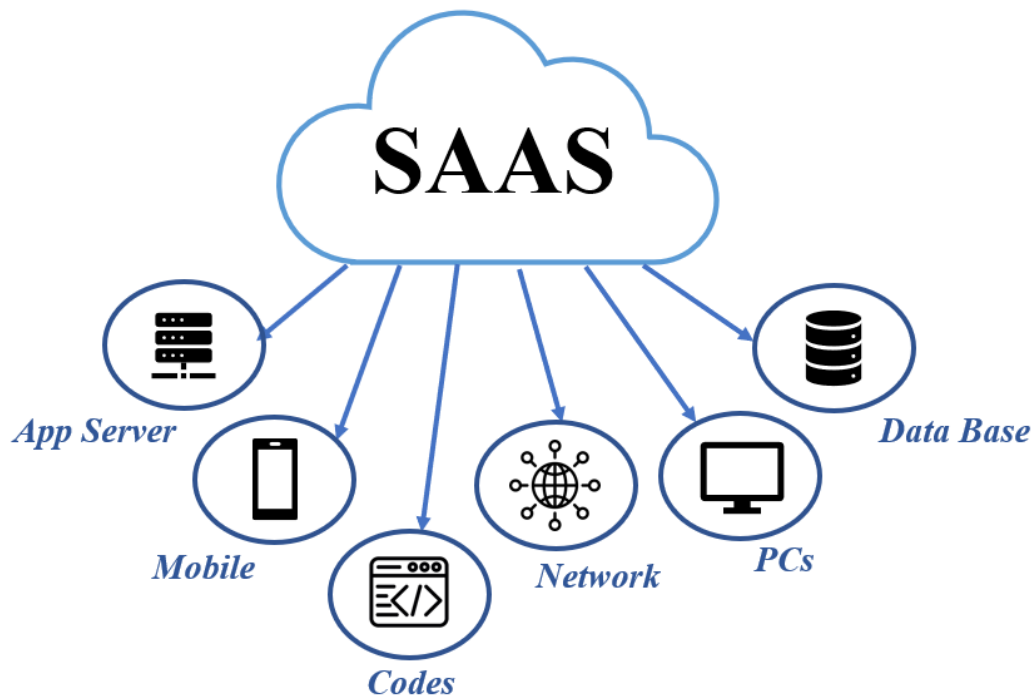
It facilitates the speedy creation of applications without requiring infrastructure management. This cloud service architecture, which is costlier than IaaS but less expensive than SaaS, simplifies the process of creating and deploying applications. Some benefits of PaaS. [11]

- quicker time to market
- Evaluating and implementing new technologies with low- to no-risk
- Collaboration made easier.
- A more scalable method. [10]



[11]

3. Software as a service (SaaS) is the ability to obtain pre-made, cloud-hosted application software whenever needed. [10] In this cloud-based service model, the software is maintained online and provided available to clients either through subscription or purchase. Some benefits of SaaS.[11]
- Very little crises
 - Effectiveness at any time or place
 - Simple scaling. [10]



[11]

III. LITERATURE REVIEW:

1. Jitesh Kumar Meena et al. [1] This paper is concerning

- Cloud computing is described as making an "innocent journey" within the Computer and Information Technology industry. This suggests a positive and transformative impact on the IT landscape.
- Cloud computing provides consumers with significant data storage capacity and computing resources.
- The text mentions two types of layers in the cloud atmosphere: the cloud provider and the cloud user. Cloud providers deliver actual data over the internet, and cloud users pay for the usage of this data. There are two types of cloud providers – infrastructural providers and service providers.

Their paper's main conclusions are:

cloud computing is a transformative force in the IT industry, emphasizing its goals, characteristics, layers, and the shift of workload. It also highlights the accessibility of cloud computing through web browsers, making it convenient for users to interact with cloud services.

2. Dr Priyanka Chawla et al. [2] This paper is concerning

- E-learning and distance learning as crucial components of the teaching-learning process, facilitated by the use of the World Wide Web for communication between clients and servers.
- Educational contents form a virtual learning environment, which is described as a web-based digital framework. Moodle is specifically mentioned as an important course management system and learning platform in this context.

- The IoE paradigm and the proliferation of smart objects, including smartphones, tablets, wearable devices, laptops, and desktops, are discussed. The IoT is emphasized as gaining prominence, with the expectation of billions of connected devices in various aspects of life.

Their paper's main conclusions are

comprehensive overview of the integration of cloud computing, IoT, big data, and emerging paradigms like Fog Computing in the context of e-learning and distance learning. It underscores the transformative potential of these technologies in enhancing educational processes and addresses the challenges associated with the growing volume and diversity of educational data.

3. Mohamed Firdaus et al. [3] This paper is concerning

- Cloud computing shifts away from the traditional model of accessing computing resources housed in data centers. Instead, it delivers services over the Internet, offering increased flexibility and efficiency.
- Cloud computing leverages virtualization to increase the utilization of physical resources. Virtual systems can be brought up or removed on demand, enabling multiple customers to use a single physical system concurrently.
- Cloud computing introduces a pay-per-use model, where customers are billed only for the resources they consume. This contrasts with traditional methods where clients paid fixed charges, regardless of actual resource utilization

Their paper's main conclusions are

The paper presents a comprehensive taxonomy of Infrastructure as a Service (IaaS) under cloud computing. It acknowledges the diversity of IaaS offerings in the market, catering to various customer segments. The complexity of these offerings, coupled with providers' claims, makes the development of a comprehensive taxonomy crucial as a foundational step for researchers.

4. Aakash Tyagi et al. [4] This paper is concerning

- Describes cloud computing as a way of consuming software and IT services over the Internet.
- Explains the sharing of processing power, storage, bandwidth, memory, and software
- Identifies cloud computing as a business model with providers offering solutions over the Internet.

Their paper's main conclusions are

Addresses the security concern of resource sharing in cloud computing. Acknowledges the advancement of cloud computing in changing the IT landscape. Points out the existing challenges, such as resource positioning, energy management, and information security. Encourages further research and development in cloud computing.

5. Priyanshu Srivastava et al. [5] This paper is concerning

- The evolution of cloud computing is briefly outlined, starting with a mention of John McCarthy's idea in the 1960s that computing could be sold as a utility. The paper notes the emergence of cloud services

by companies like Salesforce in 1999 and Amazon Web Services in 2002. By 2009, major companies such as Google, Microsoft, HP, and Oracle began providing cloud computing services.

- Services of Cloud Computing:
 1. Software as a Service (SaaS)
 2. Platform as a Service (PaaS)
 3. Infrastructure as a Service (IaaS)

Their paper's main conclusions are

The conclusion briefly summarizes the introduction, evolution, types, and components of cloud computing, as well as its advantages. The authors predict that the application area of cloud computing will continue to increase, impacting both society and business.

6 Dr. CH. V. Raghavendran et al. [6] This paper is concerning

- Cloud computing is defined as on-demand network access to computing resources, including servers, storage, networks, applications, and services.
- The NIST definition outlines cloud computing with five essential characteristics: on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service.

Their paper's main conclusions are

The conclusion briefly summarizes the introduction, evolution, types, and components of cloud computing, as well as its advantages. The authors predict that the application area of cloud computing will continue to increase, impacting both society and business.

7 Sachin Shankar Bhosale et al. [7] This paper is concerning

- Cloud computing enhances mobility for both personal and business users. Services like Google Docs and cloud-based email enable users to access their data and applications from anywhere with internet connectivity.
- AWS Elastic Compute, Google Cloud Engine, AWS Lambda. These are examples of cloud computing services provided by major cloud service providers. They offer scalable computing resources, storage, and serverless computing capabilities.

Their paper's main conclusions are

Cloud computing marks the commencement of a new stage in the arena of data and communication technology as it carries with it a development paradigm that has the potential to revolutionize the way resources are accessed, managed, and utilized.

8 Benneth Chukwuemeka Uzoma et al. [8] This paper is concerning

- The National Institute of Standards and Technology (NIST) defines cloud computing as a model that facilitates ubiquitous, convenient, and shared access to a customizable pool of computing resources and services.

Their paper's main conclusions are

In this research, we discussed the architecture, types, and characteristics of cloud computing, recognizing their key roles in shaping the information technology landscape.

IV. METHODOLOGY

The research methodology is comprised of the techniques, tactics, and strategies utilized in gathering data on various aspects of an issue. The method used is the descriptive method. Sources for the writing materials included IEEE and Google Search engine. We got varying opinions regarding cloud computing from various writers. Various authors defined "cloud" in different ways.

V. CONCLUSION

The introduction, development, types, and aspects of cloud computing, along with its benefits, are succinctly summarized in the conclusion. The authors forecast that cloud computing's application space will grow further, influencing both industry and society. But, enterprises thinking about implementing cloud computing must carefully analyze and deal with important issues, security and privacy being two of the most important ones. Protecting private information and sensitive data in the cloud are important issues that require careful consideration and reliable solutions.

VI. REFERENCES

1. Meena, J. K., & Banyal, R. K. (2021). Efficient Virtualization in Cloud Computing. In *Proceedings of the Fifth International Conference on Computing Methodologies and Communication (ICCMC 2021) (pp. CFP21K25-ART). IEEE Xplore.
2. Lone, Z. A., Chawla, P., & Rana, A. (2019). E-Learning System Architecture for Cloud Computing – A review. In *Proceedings of the 3rd International Conference on Contemporary Computing and Informatics (IC3I)(pp. Article ID: 9007286). IEEE. <https://doi.org/10.1109/IC3I48496.2019.9007286>
3. Firdaus, M. (2014). *A Comprehensive Taxonomy for the Infrastructure as a Service in Cloud Computing. In *Proceedings of the 2014 Fourth International Conference on Advances in Computing and Communications* (pp. 45-49). IEEE. <https://doi.org/10.1109/ICACC.2014.45>
4. Tyagi, A. (2017). A Review Paper on Cloud Computing. *International Journal of Engineering Research & Technology (IJERT), VIMPACT - 2017 Conference Proceedings*. ISSN: 2278-0181.
5. Bhosale, S. S., [Other Author Names], et al. (2021, June). *Research Paper on Cloud Computing. * Retrieved [Access Date], from <https://www.researchgate.net/publication/352477780>.
6. Srivastava, P., & Khan, R. (2018, June). *A Review Paper on Cloud Computing.* *International Journal of Advanced Research in Computer Science and Software Engineering (IJARCSSE)*, 8(6), Article 711. <https://doi.org/10.23956/ijarcsse.v8i6.711>.
7. Raghavendran, CH. V., Satish, G. N., Varma, P. S., & Moses, G. J. (2016). A Study on Cloud Computing Services. *International Journal of Engineering Research & Technology (IJERT), ICACC - 2016 Conference Proceedings*, ISSN: 2278-0181.
8. Mohamed, E. A. (2020, January). *Cloud Computing Trends: A Literature Review. *Academic Journal of Interdisciplinary Studies.* <https://doi.org/10.36941/ajis-2020-0008>.
9. In APA format Uzoma, B., & Okhuoya, B. (2022, December). *A Research on Cloud Computing. Preprint. [https://doi.org/\[insert_doi_if_available\]](https://doi.org/[insert_doi_if_available]).
10. <https://www.ibm.com/topics/iaas-paas-saas>.
11. <https://k21academy.com/amazon-web-services/aws-solutions-architect/cloud-service-models>.
12. <https://www.javatpoint.com/cloud-service-models>.