

Business Model Implemented Using Cloud Computing

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Summary:

This paper emphasises the paramount significance of cloud computing as a pivotal data source for artificial intelligence and data science. The advantages of cloud computing, including unparalleled flexibility and secure data storage capabilities, are highlighted. Cloud computing empowers small and medium enterprises by enabling them to leverage IT capabilities without significant upfront investments. Diverse perspectives from various authors enrich the discussion, and a clear framework for comprehending cloud services is provided. The study explores Software as a Service (SaaS) versatility and the main advantages of Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). While IaaS offers easy access to critical resources, it also acknowledges its drawbacks, such as high establishment costs and challenges for SMEs. This research provides valuable insights into the transformative potential of cloud computing in the digital age.

Introduction:

Cloud computing has gained immense significance in the contemporary era, driven by the rapid growth of artificial intelligence (AI) and data science. This revolutionary technology offers numerous advantages, particularly in the domain of data storage, by providing a convenient and efficient means of storing information online rather than relying on traditional computer hard drives. As a result, cloud computing has emerged as an essential component of modern computer systems, enabling on-demand access to data storage and computing power while minimising direct user control. These cloud computing services are facilitated by data centres distributed across the globe, with examples like Microsoft SharePoint and Google applications showcasing the widespread impact of cloud-based solutions (Helali & Omri, 2022).

Moreover, this approach has presented a viable resolution for industries and academia, allowing them to store data in streamlined services instead of resource-intensive implementations. The cloud computing model also offers significant advantages for small and medium enterprises (SMEs), empowering them to leverage IT capabilities without upfront investments in infrastructure, software licencing, or other essential prerequisites (Bello et al., 2021). Cloud computing can be seen as a key economic path in the future (Bello et al., 2022). Furthermore, governments have displayed increasing interest in cloud computing to manage IT costs more effectively and enhance service delivery performance. Cloud computing services provide scalability, network services, and machine learning (Das & Dash, 2020). According to James et al. (2022), the Cloud computing platform encompasses a diverse set of applications along with a user-friendly interface. Its backend comprises essential services like cloud runtime, storage, management, and security. Notably, cloud computing offers a variety of service models, namely Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).

Helali also concurred with James et al. (2022) that the cloud computing model focuses on these three primary service models. Moreover, the National Institute of Standards and Technology (NIST) introduced these models as a standard for cloud computing.

IaaS provides direct access to fundamental cloud computing resources, including computation power, data storage capacity, and networking. PaaS offers a platform for developers to build, deploy, and

manage applications without dealing with the underlying infrastructure. SaaS provides access to software applications over the Internet, eliminating the need for local installations (Karmakar et al., 2022).

This essay aims to address the following key questions to provide comprehensive insights into cloud computing:

- The impact of cloud computing on business models
- An exploration of the three primary cloud computing models: IaaS, PaaS, and SaaS

The introduction provides a comprehensive discussion of cloud computing's significance as a data source driving artificial intelligence and data science. It effectively highlights the advantages of cloud computing in terms of flexible and secure data storage, surpassing traditional computer systems. Additionally, the introduction emphasises the empowering impact of cloud computing on small and medium enterprises, allowing them to leverage IT capabilities without substantial upfront investments.

Moreover, the inclusion of various authors' perspectives, such as Karmakar's insights on Infrastructure as a Service (IaaS), further strengthens the discussion. The agreement between Helali and James regarding the three primary cloud computing models (IaaS, PaaS, and SaaS) provides a clear framework for understanding cloud services.

Furthermore, the introduction sets the stage for the essay by outlining the key questions it aims to address, ensuring readers have a clear understanding of what to expect in the upcoming discussion.

Body of the Report:

SaaS (Software as a Service) offers both data and application services. In this model, the service provider provides all of the necessary infrastructure and platforms, as well as applications and data. SaaS is the first and most popular cloud service model, with a wide range of provider options, making it the preferred option for many users (Abdalla et al., 2019). Further, Software as a Service (SaaS) is an excellent choice for hosting complex programs such as client relationship management (CRM) or internet-based resource administration. Users can store their information and data remotely using SaaS, which provides convenience and accessibility. Additionally, storing software programs off-site relieves clients from the burden of maintenance and upkeep. In other words, if the hosting service decides to make modifications, it is beyond the client's control. Figure 1 illustrates the position of SaaS in the stack of applications (Abdalla et al., 2019).

With a platform as a service PaaS, clients can enhance their applications effectively. PaaS typically offers evolving toolkits and models for application improvement, along with administration and payment service formats. PaaS services typically include an operating system, programming language environments, web servers, and databases. PaaS clients can easily enhance and deploy their software systems on the streamlined cloud service, avoiding the complexities associated with managing software and hardware layers. Furthermore, because clients are not required to purchase the foundational infrastructure, deployment time is significantly reduced. It is common for PaaS solutions to offer automated scaling of storage resources based on the application's requirements. Moreover, with PaaS, cloud users can avoid the need for manual resource allocation, as it allows them to easily create, implement, and manage integration streams refer to Figure 2 study the PaaS (Abdalla et al., 2019).

Infrastructure as a Service (IaaS) provides easy access to critical physical resources such as computing, memory, storage, and networking via the Internet as services (as shown in Figure 4). However, traditional physical resource use has several disadvantages. To begin with, the cost of establishing computer infrastructure is significantly high. Second, dealing with configuration, management, and maintenance presents a slew of difficulties. Furthermore, Due to these constraints, small and medium-sized businesses find it difficult to allocate capital to IaaS in the early stages of their business. As a solution, they choose to use IaaS services, which allows them to begin operations without making significant upfront investments. Notably, the popularity of IaaS clouds is growing faster than that of other cloud services. The compound annual growth rate (CAGR) for IaaS has reached an impressive 20.4% between 2015 and 2020(Badshah et al., 2022).

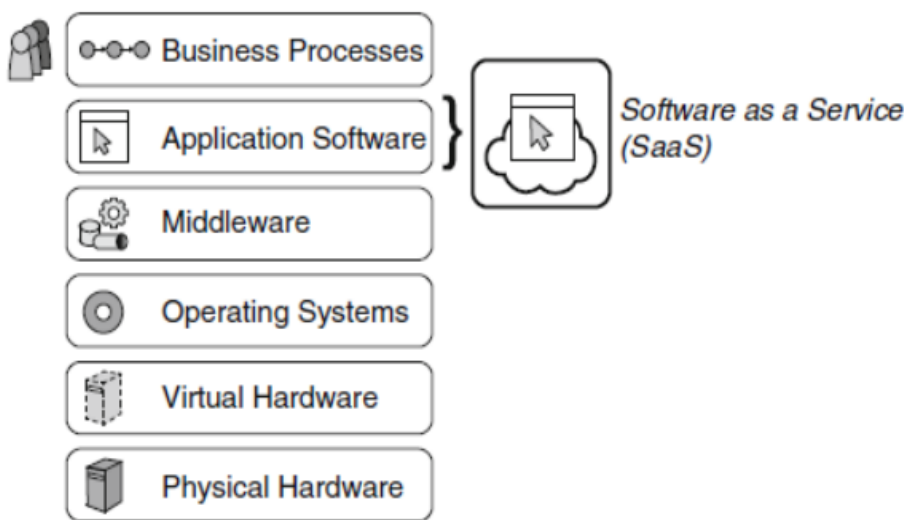


Figure 1 demonstrates SaaS in the Stack of applications (Abdalla et al., 2019).

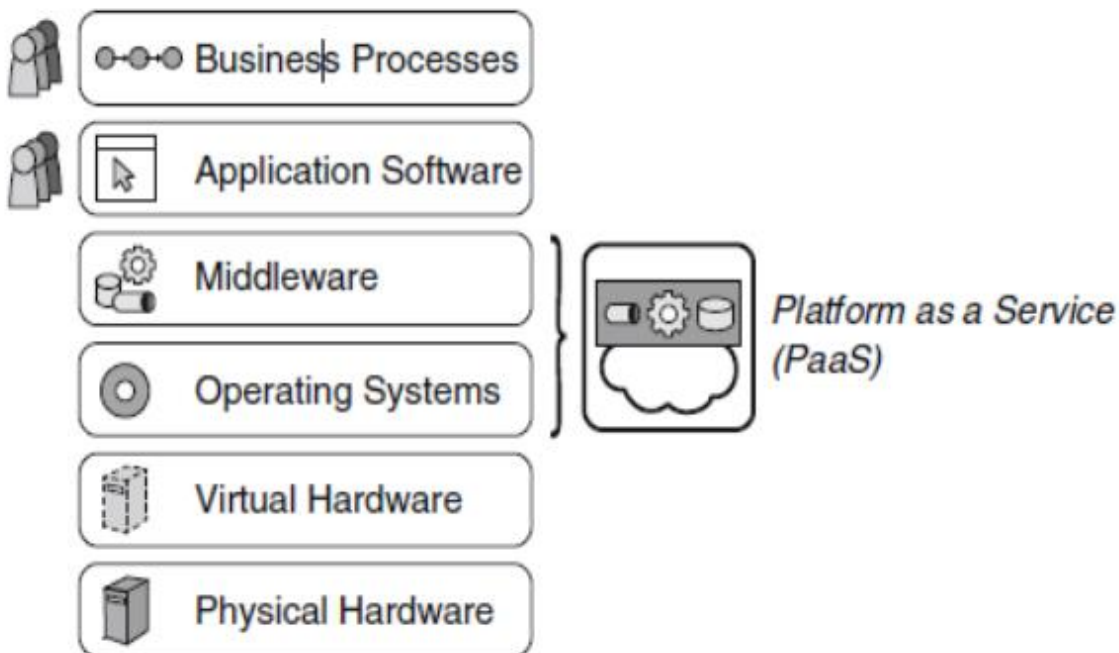


Figure 2 explains the PaaS in the Stack of applications (Abdalla et al., 2019).

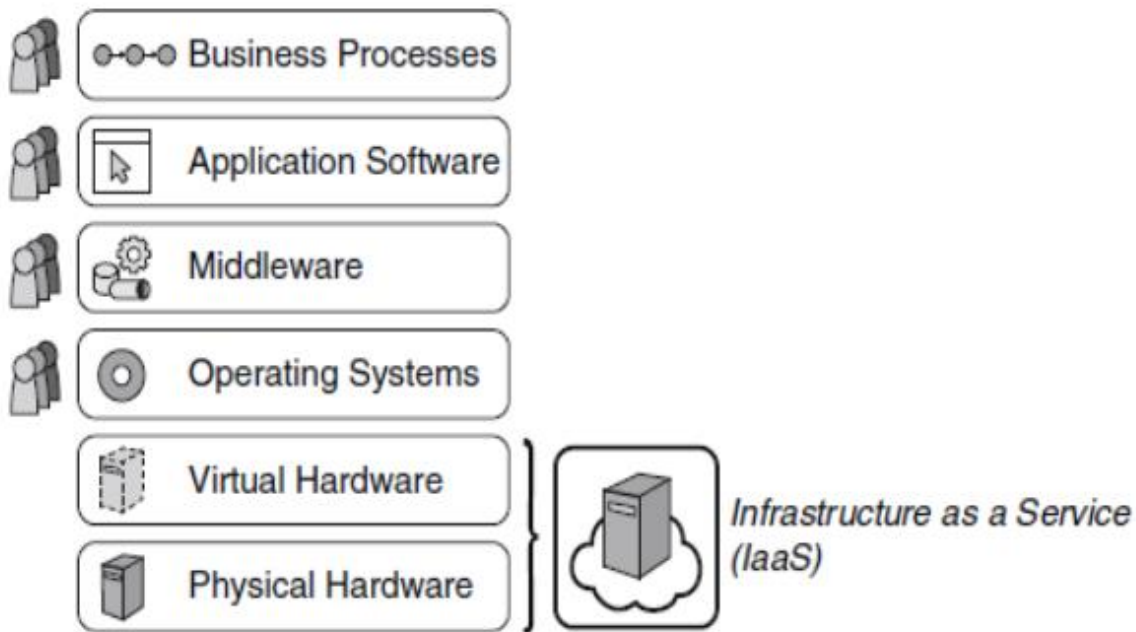


Figure 3 explains the IaaS in the Stack of applications (Abdalla et al., 2019).

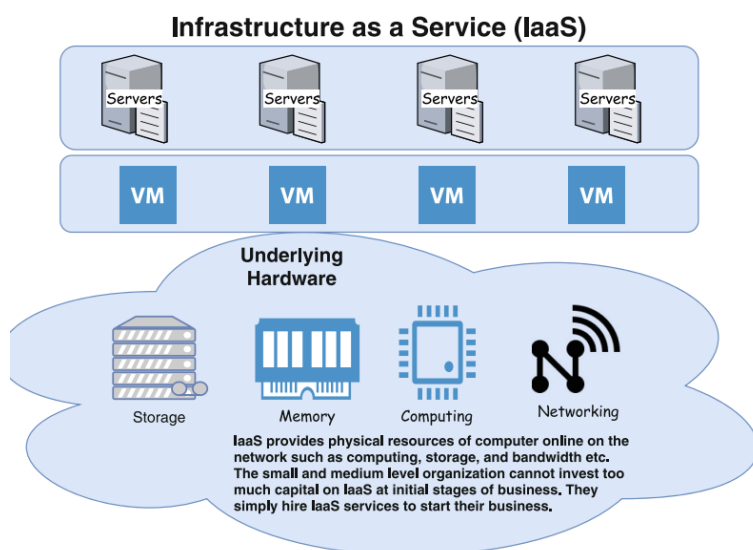


Figure 4 demonstrates the structure of the IaaS cloud (Badshah et al., 2022).

Conclusions:

In conclusion, this paper has delved into the paramount significance of cloud computing as a pivotal data source driving artificial intelligence and data science. The advantages of cloud computing, including its unparalleled flexibility and secure data storage capabilities that surpass traditional computer systems, have been effectively highlighted. Moreover, cloud computing's empowering impact on small and medium enterprises, enabling them to leverage IT capabilities without substantial upfront investments, has been recognised.

The inclusion of diverse perspectives from various authors, such as Karmakar's insights on Infrastructure as a Service (IaaS), has bolstered the discussion and enriched the overall understanding. Additionally, the consensus reached by Helali and James on the three primary cloud computing models (IaaS, PaaS, and SaaS) has provided a clear and structured framework for comprehending cloud services.

The introduction successfully set the stage for this essay, outlining the key questions it aimed to address and ensuring readers had a well-defined understanding of the forthcoming discussion. The subsequent exploration of Software as a Service (SaaS) demonstrated its versatility by offering both data and application services, making it the most favoured cloud service model with an array of options for users. Notably, the benefits of SaaS in handling programming implications, such as client relationship management, and its feature of remote information storage were underscored.

Platform as a Service (PaaS) was thoroughly examined, shedding light on its main advantages, including effective application enhancement, simplified management, and automated scaling. Furthermore, Infrastructure as a Service (IaaS) emerged as a vital solution, granting easy access to critical physical resources like computing, memory, storage, and networking as services, ultimately leading to enhanced flexibility and scalability.

Despite the manifold benefits of IaaS, this research acknowledges its drawbacks, such as the high establishment cost and the challenges faced by small and medium enterprises (SMEs), especially in their early stages.

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