The Role of AI in Cloud Computing

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Abstract: Cloud computing is a method of delivering computer services over the internet. Artificial intelligence (AI) is one of the methods for intelligently automating tasks using computer resources. Cloud computing can be an AI platform, and AI can automate the management and operation of cloud computing, but they are both just a means to each other.Artificial intelligence (AI) is a type of technology that is expected to boost current cloud platforms and drive next-generation cloud computing technologies. The most critical is that, in an era where we are dealing with a growing amount of available data, we need technology that can quickly summarise, analyse, and act on this data in order to enhance processes and outcomes. This paper provides an overview of what are the benefits of combining AI and Cloud computing.

Index Terms: Artificial Intelligence, Cloud Computing, Machine Learning.

I. INTRODUCTION

Artificial intelligence and cloud computing are now collaborating to improve our lives and make it more simple and sublime. Amazon's Alexa, Siri, Google Home, and other digital assistants merge artificial intelligence and cloud computing to give the best of both worlds. Artificial intelligence (AI) cloud computing combines machine learning technologies with cloud-based computing environments to allow intuitive, connected experiences. AI's technologies are playing a significant role in cloud computing on a large scale, particularly in businesses, allowing organisations to have easy access, workflow, storage, and sharing of data while maintaining privacy and reliability, reducing cost and energy. The structure of the paper is organized as follows: Artificial Intelligence and the results so far from the merger between AI and Cloud computing is described in Section 2. The benefits of combining AI and Cloud computing are explained in Section 3. And finally, the conclusion is outlined in Section 4.

II. ARTIFICIAL INTELLIGENCE

Artificial Intelligence (AI) is the term used to describe the simulated intelligence of machines. The word refers to the end result of endowing machines with human-like cognitive abilities, such as reasoning, learning from the past, discovering meaning, and generalising. It is based on the belief that human intelligence can be described in such precise terms that it can be replicated by a computer. As a result, these machines are programmed to "think" like humans and to imitate their behaviours and responses in specific situations. The cloud and AI work well together in a variety of ways, and experts believe AI may be the technology that revolutionises cloud computing solutions. AI as a service enhances current cloud computing solutions while also opening up new avenues for development. The results so far from the merger between AI and cloud computing are:

2.1 AI Infrastructure for Cloud Computing

When a wide collection of data is applied to specific algorithms, we can create Machine Learning (ML) models, and it's critical to use the cloud to do so. The models will learn from the various patterns found in the data. As we give more data to this model, the accuracy and precision of the forecast improves. for example,Thousands of radiology reports are used to train machine learning models that detect tumours. Since it can be tailored to meet the needs of the project, this pattern can be used in any industry. The necessary input is data, which can be in various forms such as raw data, unstructured data, and structured data. Furthermore, services such as batch processing, serverless computing, and container orchestration are now being used to automate machine learning tasks. Predictive analytics are also made easier with IaaS.

2.2 AI Services for Cloud Computing

It is possible to enjoy services that are similar to those offered by AI systems even without developing a specific ML model. Developers may use text analytics, speech recognition, vision, and machine translation, for example. This is something they can easily incorporate into their development projects. Despite the fact that these platforms are standardised and not customised to particular needs, cloud computing providers are working to develop them on a regular basis. Users can provide customised data to cognitive computing systems, which can then be trained to provide well-defined services. The problem of determining the effective algorithm or training model is thus eliminated.

III. BENEFITS OF COMBINING AI AND CLOUD COMPUTING

In this section describes about the benefits of combining AI and Cloud computing.The benefits are as follows:

3.1 Cost-Effectiveness

Cloud application creation removes the need for on-site hardware and software purchases and configuration since it is available through the internet.It also removes the need for on-site data centres and the costs associated with them, such as IT experts to operate the centres, servers, and round-the-clock energy to power and cool the servers.

3.2 Increased Productivity

Unlike a hard drive or local storage unit, which necessitates plenty of IT management tasks such as hardware configuration, software patching, racking, and stacking, cloud computing is entirely internet-based and hence eliminates these requirements. This allows the IT department to concentrate on other business objectives.

3.3 Reliability

The risk of loss is increased by using a hard drive or physically accessible facilities. The chance of a crash, missing data, backup failure, and other issues exists. Cloud storage applications, on the other hand, maintain business continuity, as well as quicker and simpler disaster recovery and data backup.

3.4 Availability of Advanced Infrastructure

When running AI applications on servers with many and very fast Graphics Processing Units, they are usually very fast (GPUs). These devices, on the other hand, are prohibitively costly for many businesses. These companies will be able to use AI as a service in cloud application creation at a lower cost.

3.5 Improving Data Management with AI

The use of AI in the cloud will result in a more efficient synthesis of data systems for identifying useful data. This data can then be used to improve business operations. With the amount of data growing all the time, it's becoming evident that businesses need a responsive cloud environment. AI can help businesses manage vast amounts of data, which can then be analysed to make sense of it. In this way, it increases the responsiveness of the company's cloud ecosystem while also improving its own capabilities to boost productivity and efficiency.

3.6 Security

Another field where AI can play a critical role is cyber security. A lot of data travels back and forth between cloud users and cloud service providers (CSP). The majority of the time, cyber criminals examine this traffic for any vulnerabilities. Network security tools powered by AI can be deployed across cloud infrastructures to track and analyse network traffic in real time.The AI device raises a red flag and security protocols are activated as soon as some anomaly in network traffic is observed. AI can be used in this way to protect cloud infrastructures from cyber attacks in a proactive manner. Cyber threats will be "halted in their tracks" before causing any harm to data stored on cloud service providers (CSPs).

3.7 Enhances Decision-Making

AI-enabled companies can spot patterns and trends in massive datasets. AI accomplishes this by referring to historical data and comparing it to current data, providing you with well-informed, data-backed intelligence. Since AI processes do not require human intervention, the output generated by them is more accurate, eliminating the possibility of human errors in data analysis. AI technology allows for faster data collection, allowing companies to respond to consumer inquiries more quickly and effectively.

IV. CONCLUSION

When it comes to cloud computing and artificial intelligence, the possibilities are practically endless.We have recently begun to understand the genuine capability of AI whenever it is combined with the cloud.Both AI and cloud computing can also be defined as complementary technologies. We can take AI to a whole new level in terms of scope and applicability by leveraging the cloud's capacity.We are on the verge of witnessing a synergetic partnership between Artificial Intelligence (AI) and cloud computing in the near future.

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