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Cloud Computing Impact on the Healthcare Industry

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ABSTRACT: ***Network-based access to information or communication tools such as email and calendars is made possible by cloud computing. In terms of communication, Whatsapp is also a cloud-based infrastructure and is a prime example of cloud computing. All communication or data is housed in the service provider's hardware. Businesses of all sizes, types and industries employ a wide range of use cases, such as data backup, email, disaster recovery, software development, virtual desktops, testing, big data analytics, as well as consumer-facing online apps. A health care system built on the cloud reduces operating costs while providing more personalized treatment, effective procedures, and better health services. Patients have increased access to their medical records and receive instant answers from healthcare professionals. In this paper, the author discusses cloud computing, and how cloud computing is beneficial to the health industry. The main purpose of this paper is to know more about cloud computing's impact healthcare industry. In the future through this paper, will be aware of the benefits of cloud computing for the health industry.***

KEYWORDS: ***Cloud Computing, Infrastructure, Industry, Hardware, Healthcare, Security.***

1. INTRODUCTION

The need for dependable infrastructure in IT or data storage has been driven by the escalating demands of technology. The idea of cloud technology is the one that has recently taken center stage. The on-demand accessibility of information systems resources like data storage or processing power is the most basic definition of cloud computing [1], [2]. The word “cloud” refers to data centers that are scattered over several places and made available to numerous users through the internet from centralized servers. Documents may be readily stored in the cloud and retrieved at any time from any device. Initially, you could only access the software and applications from a certain location, which was a computer or server. Because of the cloud, people may now access their programs and information over the internet. This principle also governs data storage. Even if you keep crucial work folders on your PCs and servers, it is possible to store the data remotely or back it up to the cloud [3], [4].

1.1. Cloud-based Healthcare System:

Cloud-based healthcare is the integration of cloud computing technology for the planning and administration of cloud-based healthcare services. More healthcare providers are choosing to collaborate with businesses that provide cloud computing solutions to store and retrieve digital information. Both big and small provider firms regard the capacity to safely store data off-site as a critical advantage. The following crucial healthcare industry demands are satisfied by cloud-based healthcare systems [5]:

- Access to computational power and vast amounts of storage on demand, is not possible in conventional healthcare systems.
- Support huge datasets for genetic data dumping, radiological pictures, and EHR.

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- Ability to exchange EHR across approved doctors, hospitals, and other care institutions in various places, allowing quick access to information that might save lives and reducing the need for additional testing.
- Analysis and monitoring of data on diagnosis, cost, treatment, and performance should be improved.

A cloud-based healthcare system reduces operational costs while providing more customized treatment, efficient operations, and greater health services. Patients can benefit from improved access to their medical records and faster responses from healthcare experts. EMR or medical billing technologies are included in the healthcare ecosystem when it is controlled by an on-premise server [6].

- upkeep of upgraded records
- Reserve Facilities
- Issues with load balancing
- Utilizing Space

With these drawbacks, choosing a cloud health approach is time-sensitive. By implementing a cloud-based health system, all costs and infrastructure would be managed. The telehealthcare and telemedicine technologies used by the cloud-based healthcare system are limited to remote patient monitoring. Any cloud-based healthcare system aims to regulate simple interoperability with a structured hierarchy. New ideas for healthcare management solutions are developed by a well-organized cloud-based healthcare system. Cloud solutions can scale up or down all the storage resources and adapt to constantly changing demands since cloud computing is a sizable shared pool in the healthcare sector [7].

1.2. Moving to the Cloud: Health Organizations:

To improve patient care, introduce innovative patient care apps, and optimize operations, healthcare institutions have been implementing new technology. Despite these IT solutions, they must contend with issues including high infrastructure costs, the demand for computing resources, scalability, multi-tenancy, universal access, or an increase in collaboration needs. These difficulties are addressed by the cloud's features, which include:

- *On-demand service:* Without any human involvement, the resources are delivered right away.
- *Resource pooling:* Multiple users may simultaneously utilize cloud services.
- *Elasticity:* It is feasible to add, delete, or upgrade depending on the needs of the company.
- *Broad Network Access:* From every location at any time, a wide variety of network accessibility is offered.
- *Measured service:* Customers only have to pay for what they use.

1.3. Health Care Delivery Methods: Traditional Vs. Cloud-Based Customization

Before electronic healthcare records, which allowed for customization, the desired bespoke solution had to be developed by highly qualified programmers or specialists. Contrarily, cloud-based systems have built-in functionality and care plans or are completely customizable. As a result, a variety of tailored templates as well as user-friendly interfaces are offered for cloud-based bespoke solutions [8].

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1.3.1. Using Capabilities

To use traditional medical systems, the doctor's office must install a server, internal data storage, software, and hardware. With today's cloud-based technology, logging in from any web server-using website on any device is quick, easy, and adaptable. Collaboration, data sharing, and interoperability have all been facilitated by cloud services. With cloud-based services, automatic updates and maintenance are possible since data access ensures that the data is consistent with the most recent version. Updating such information is exceedingly challenging, expensive, and time-consuming under the current healthcare system.

1.3.2. Observance and Responsibility:

It is recommended to take HIPPA rules into account while deciding between conventional healthcare as well as cloud-based healthcare facilities. Concerning HIPPA conformity, access control, as well as security issues, the regulations and laws should be in line with the demands of protected health information. Healthcare professionals in cloud-based health services don't need to be concerned about system breakdown, natural disasters, or weather patterns that tend to crash the platforms. In conventional medical systems, the backup needs, upgrading code-sets, security updates, or protocol demands are unsafe and impractical. The cloud-based secured health information is always available from any location at any time. Remember that liability concerns should always be HIPPA compliance [9].

1.3.3. Security:

Although conventional web-based servers are more vulnerable to malware, viruses, and hacking attempts than cloud-based servers, both require security awareness. Whether you select traditional healthcare solutions or cloud-based ones, the security of personal health information (PHI) is a significant issue. Both systems need frequent storage capacity audits, analyses, and monitoring. Given that the usage of mobile devices has increased the potential of cyber-attacks on PHI, human engagement with any system is essential. While still safe, the use of stringent encryption techniques with a cloud-based EHR system is more secure than using clients/servers or traditional paper records. This plan is based on how and where such systems are installed and protected [10].

2. DISCUSSION

2.1. How Cloud-Based Technologies can Solve the Challenges Facing the Healthcare Sector:

By enabling customers to access the architecture, platform, as well as software offered by the cloud suppliers, cloud computing offers some advantages. Two forms of cloud computing are available in healthcare. Infrastructure as a Service, Software as a Service, or Platforms as a Service are three different ways to implement the distribution model (hardware/software). Depending on who owns it, the deployment type might be private, communal, public, or hybrid. The advantages of using cutting-edge cloud-based healthcare sector pain points are as follows.

2.2. Accessibility to Digital Healthcare Records from One Location:

As in previously, every individual would carry their own set of paperwork to every doctor's visit. The documentation is difficult for the employees and physicians to manage and keep up with. Through cloud migration, this procedure has been modernised and made more manageable. All of the medical records are kept in one place as a result of cloud services.

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Through online portals at healthcare institutions, these records are always retrievable and available. For fast access to medical records and accurate patient diagnoses, a secure cloud platform makes sure that data storage facilities with hosting options and virtual machines are accessible.

2.3. Increased patient care standards:

A cloud-based healthcare system that delivers cutting-edge therapy to the workplace enhances patient care. With only a few clicks, a patient may use cloud services to begin virtual sessions, schedule a doctor's appointment, set up auto-reminders for subsequent appointments, and follow up. A reminder to take medications, frequent post-surgery doctor communication, and upcoming facility information are all provided through the cloud platform. With the use of cloud-connected medical infusion pumps, doctors may also remotely check on their patients' vital signs. Medical records for users may be preserved and accessed remotely by doctors, and they can be shared, read, and saved on the cloud. Thus, by updating the patient's health information in the cloud system as soon as they check into the hospital, the patient's physicians may start the right therapy right away. Practical approaches to enhance patient care include lowering costs, better management, or timely attention to every aspect.

2.4. How is cloud computing used in the healthcare industry:

Cloud computing delivers a safe infra-structure for medical facilities, research facilities, insurance companies, and doctor's offices. Its main objective is to boost processing power while needing a less initial capital outlay. Cloud computing can also make it easier for healthcare systems and apps to innovate and modernize. The healthcare data management system ultimately becomes more scalable and adaptive as a result of it. Gathering patient health data may be one of the initial phases in the workflow, depending on the functionality. The patient's side sensor node is responsible for managing all of the patient's data. The patient's heart rate, blood pressure, and other physiological details are included in this data. The biometric hardware collects the data and transmits it to the wireless sensor node. As a consequence, employing a wireless sensor network and a sensor data dissemination mechanism, the information is posted to an online cloud [11].

2.5. The healthcare industry's uses of cloud computing:

The development of apps for high information processing and administration is imperative in the context of cloud computing. A wide range of cloud service products is available for the healthcare industry. This trend is illustrated by several cloud-based healthcare apps and architectural designs, as seen in Figure 1. The following uses of cloud computing in health are intended to advance a technologically advanced healthcare system.

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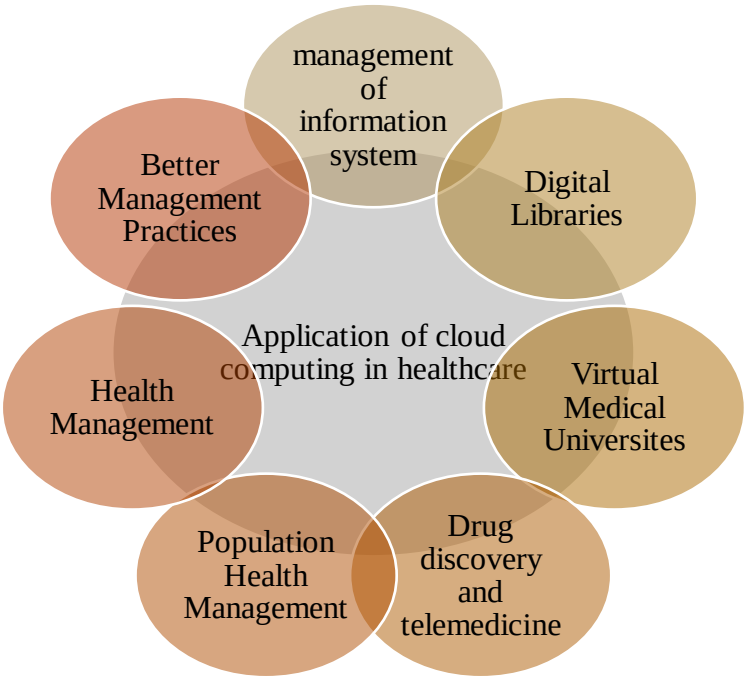

Figure 1: Illustrate the Application of Cloud Computing in Healthcare.

CONCLUSION

Eventually, the data is everywhere, and the healthcare sector is no exception. There is a tremendous amount of promise for cloud computing in the healthcare sector as cloud technology develops tremendously. Nowadays, access to high-quality healthcare is considered a fundamental human right. Additionally, this is a pricey and extremely involved topic. Even the most developed nations in the world struggle to meet the enormous amount of healthcare demands. However, utilizing the potential of cloud computing in the healthcare system may undoubtedly result in practical advancements helpful for excellent and cheap healthcare for all, as opposed to a select group of privileged individuals. The author of this paper examines cloud computing and the advantages it offers the health sector. The main goal of this paper is to learn more about how cloud computing will affect the healthcare sector. Through this study, readers will become aware of the advantages of cloud computing for the medical sector in the future.

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