

Combining Cloud Computing with Artificial intelligence and Its Impact on Telecom Sector

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Abstract- The combination of artificial intelligence (AI) and cloud computing has been an emerging trend in recent years. This trend has substantial ramifications for a variety of different businesses, including the sector of the economy that deals with telecommunications. The cloud computing model offers a platform that is both scalable and cost-effective, making it ideal for storing and processing massive volumes of data. The application of AI algorithms to this data can result in the extraction of important insights and the improvement of decision-making procedures. Telecommunications firms stand to gain improved capabilities such as real-time data processing, predictive maintenance, and automated network management as a result of the combination of these two technologies. In addition, firms that provide telecommunication services can benefit from optimization of their operations, cost reduction, and increased efficiency when they use AI and cloud computing. For instance, predictive maintenance algorithms can detect impending faults in equipment before they happen, which paves the way for preventative maintenance and cuts downtime significantly. [1] Artificial intelligence (AI) and cloud computing (CC) are two business-oriented technologies that are very much on the horizon as smart transformation technologies for businesses to be smarter once in order to render their services to their customers in a smart way, which means promptly, efficiently, and affordably that best satisfy the customers. Artificial intelligence (AI) and cloud computing (CC) are two business-oriented technologies that are very much on the horizon as smart transformation technologies for businesses to be smarter. This research investigates the ways in which CC and AI are utilized by MGA-MENA, the most prominent telecom operator in the Middle East. When applied together, the technologies of cloud computing and artificial intelligence will result in an improvement for a smart MGA-MENA business in the areas of operational services, product efficiency, better products, and more customer-satisfying services [2]. There is only one conclusion that can be drawn from this line of reasoning, and that is that gigantic telecom firms like MGA-MENA, with their massive customer bases, high number of transactions per minute, cloud computing, and artificial intelligence, offer a brand new and innovative economic potential. Therefore, it is imperative for the telecoms industry to maintain an active and contemporary technological presence.

Key words: Telecom Industry, Technology, Artificial Intelligence (AI), Cloud Computing (CC)

1. Introduction

Computing in the cloud and artificial intelligence (AI) have both emerged in recent years as two of the most disruptive technologies in the world of telecommunications. Integration of these technologies has opened up new opportunities for telecommunications companies to improve their operational efficiency, enhance the experience of their consumers, and boost their revenue [1]. This case study will analyse the usage of cloud computing and artificial intelligence in the telecoms industry. A particular emphasis will be placed on the influence that this combination has on the quality of the customer experience as well as the operational efficiency of the business. We are going to look into a specific telecom business that has already implemented these technologies and assess the results of doing so. At the conclusion of this case study, it is our aim that you will have a greater knowledge of how cloud computing and AI may be utilized to promote innovation and success in the telecommunications industry. Across the Middle East, Asia, and Africa, a well-known telecommunications firm known as MGA-MENA, which is presently present in 16 countries, has made the concepts of cloud computing a reality, which has resulted in a substantial improvement to the company's goods. At the same time, the company is currently present in 16

countries. It incorporates artificial intelligence as a part of its ambition to become the intelligent corporation of the future. This allows it to manage its business operations and keep control over the experience that its customers have with the company. Today's organizations face a number of challenges that prevent them from achieving sustainable growth through the application of innovation and development strategies, which is the only viable path forward. Companies in the telecommunications industry, such as MGA-MENA, operate in complex environments and are heavily dependent on technology for both their growth and the supply of services to their consumers. This is true for both the growth of the company as well as the delivery of services. They need to make efficient and cost-effective use of the most modern cloud computing and artificial intelligence technologies, which represent improvements above human calculation and intellect or, at the very least, a first step on the road to becoming such advancements.

These technologies are represented by the phrases "cloud computing" and "artificial intelligence," respectively. Robotics is yet another branch of technology that is making significant headway. They are not competing "technologies," but rather technologies that complement one another.[3] Telecoms firms stand out in the highly competitive current business environment, which is controlled by extremely large corporations and cutting-edge technologies. This is due to the fact that telecom companies have a vast geographic and client reach, in addition to the volume and complexity of their activities. MGA-MENA, which is one of the major telecommunications companies in the world, conducts business on a significant scale in all three of these regions: the Middle East, Asia, and Africa.

2. Literature review

To begin, a ground-breaking study on cloud computing in relation to telecommunications companies highlights numerous benefits of cloud computing that accrue to telecommunications in terms of capital, cost, time, marketing, customer relations, service delivery, customer satisfaction, and profits, to name a few of these advantages. Cloud computing is beneficial to telecommunications in a variety of other ways as well. Since they are not hampered by computing issues, which are essentially instruments for commercial goals, they are free to concentrate on offering services at the highest possible level of happiness for their customers. In conclusion, utilizing cloud computing is a preferable method for accomplishing the goals set forth by a corporation [1]. According to the findings of yet another study, the advent of new digital technologies is fundamentally transforming the nature of the modern business environment, rendering the traditional strategy process increasingly insufficient. The approaches for the development of strategies need to be modernized so that they can continue to be useful in this day and age of artificial intelligence, digital reengineering, and cognitive computing. The success of Dubai's electronic government can be attributed to a number of factors, including its first-rate IT infrastructure, the support that the government provides for innovative ideas, the availability of sufficient financing, and the high levels of electronic engagement from both individuals and businesses.[2]

Reports suggest that artificial intelligence is essential to the success of firms in the telecommunications industry since it assists in the creation of consumer profiles and tailors services to the requirements and interests of individual customers.

In addition to this, AI assists the operation team by predicting when a system will break down and providing prompt action to fix the problem. AI can also help improve customer support. For

example, Vodafone has developed a chatbot called TOBi that assists customers with online questions and problem-solving. The satisfaction of the customers will increase as a result. [3] According to him, there has been an increase in the number of people using CC and AI, in addition to the expansion of the size of the communications network.

The sector has witnessed a variety of user desires and preferences during the course of its existence. Because of the increased demand for specialized networks (AI), this sector's operations simply cannot function without the assistance of artificial intelligence. Cloud robotics is a rapidly developing field of research that is made feasible by today's widespread internet connection and the rising array of powerful cloud computing services. This access and these services have made cloud robotics a discipline that is now possible to study. Humanoid, industrial, mobile, and other classes of robots, as well as other types of robots, have all benefited from successful implementations of the technology, which frequently occurred as a direct result of partnerships formed between prominent IT businesses and robot makers. [4] As a result of the fact that the communication industry is currently facing a number of operational challenges, such as designing, maintaining, and managing, the industry stands to benefit from AI in a number of different ways. Businesses in the communication industry need to be able to make sound decisions in order to successfully manage their intricate and ever-changing operations. Using deep learning and the training data that is currently accessible in business, machines are able to analyse the huge amounts of data that have been obtained as a result of data mining. As AI grows more proficient at managing data such as traffic, the precision of judgments made in this industry will also increase. [5] AI and cloud computing are beneficial to the telecom business because they allow for a greater focus on security, which is especially important given the surge in security problems caused by downed networks and losses. Because of AI, there has been an increase in the security of systems, and machine learning is being used to automatically identify any attacks. As a direct consequence of this, there have been fewer attacks, which is to the advantage of both users and businesses. [7] Due to the rapidly growing number of customers served by the telecom business, it is now impossible for humans to evaluate the enormous amounts of data that are available for usage in the sector. while making predictions about the future.

It is now possible, with the use of artificial intelligence and cloud computing, to analyse huge volumes of data in order to classify traffic, produce more accurate forecasts, discover anomalies, and eventually optimize networks for enhanced performance.

Because of this, the telecommunications industry is now better managed and more efficient, which eventually contributes to an increase in the value of the services that are offered to consumers. Artificial intelligence (AI) and cloud computing are the only technologies that will make it possible for users in the future to have specialized networks and packages that are suited to their requirements using AI. [6] Algorithms that monitor networks these days seek out unexpected build-ups of activity that could be the cause of undesirable occurrences such as distributed denial-of-service (DDoS) assaults and attempted hacks. [7] These undesirable events include things like attempted hacks and DDoS assaults.

AI and CC are both faster and more reliable techniques to anticipate potential threats to a network. There are still challenges to overcome, despite the fact that the implementation of AI in the cloud is an inevitability. The greatest challenge is finding enough people with the right skill sets to work

on artificial intelligence in the cloud. The telecommunications businesses that make use of that system will need to be prepared to invest a sizeable amount of money in their workforce in order to provide their workers with the knowledge and skills that are essential to the sector's continued success. [9] Conducting research on the use of AI technologies in predictive analytics is another challenging endeavour. They employ cloud services to develop and train machine learning models, which enables them to gain access to insights that are both relevant and practically applicable. However, the usefulness of these models is contingent on their being provided with an adequate quantity of data. Before employing a cloud-based artificial intelligence service, businesses need to ensure that they have adequate security measures in place to protect their private data and that they are complying with all applicable compliance rules. [15] According to a survey that was conducted by Accenture to analyse the potential economic influence that artificial intelligence could have on 16 different industries, businesses in every industry need to consider artificial intelligence as a prospective change agent in their strategies for investment, innovation, and human capital development. Artificial intelligence has the potential to increase labour productivity by taking over low-value-added or supporting responsibilities, freeing up human workers to focus on higher-value tasks. [14] Interface technologies illustrate how difficult it is to govern issues that cut across disciplinary boundaries, and technology that is based on artificial intelligence may require adaptations to be made in a variety of legal fields.

Recently, technologies such as artificial intelligence and cloud computing have been applied to the telecommunications industry in an effort to enhance both performance and customer happiness. It is not easy to implement and train these CC and AI technologies in the telecom industry because of the complexity involved.

However, the usage of CC and AI will raise productivity and effectiveness across a wide range of areas while also lowering costs, promoting sustainability, and ultimately boosting customer happiness, retention, and loyalty. It is possible that new threats, such as those to security, privacy, and reputation if they are misused, will need to be taken into consideration in the future. [16]

3. Data collection

The primary objective of the data collection, which consisted of interviews, observations, discussions with staff or groups, and documentation of activities in the engineering department, was to investigate the application of CC and AI in the most successful telecommunications firm in the Middle East, MGA-MENA. These methods ultimately proved to be trustworthy sources of information regarding the subject of the study. The cumulative impact of all of this is that MGA-MENA Company will eventually decide to use this strategy in order to eradicate the possibility of human error and advance toward operational excellence, cost savings, and a quicker reaction time to network disruptions, all of which will ultimately result in an improved experience for the company's customers. It is common knowledge that the telecommunications industry is making important contributions to the ongoing revolution in the field of artificial intelligence. MGA-MENA is widely regarded as the most successful information and communications technology company in the United Arab Emirates as a direct result of its use of cloud computing and artificial intelligence. The MGA-MENA engineers now have access to a comprehensive database that contains all of the network, customer connection, and data traffic logs. This is made possible by

cloud computing. As a consequence of this, engineering was able to transform into a proactive organization rather than a reactive one, with AI playing a significant role that is anticipated to continue to expand over the course of the next few years. MGA-MENA Company is also constructing two cutting-edge Points of Presence (POP) to assist EXPO 2020 in Dubai. This is being done in order to provide a cutting-edge digital experience for the 25 million tourists that are projected to attend. These POPs, which stand for the telecommunications network of the future, are completely dependent on the cloud and AI for coordination.

Different criteria were considered to select appropriate studies for this research and the studies that met the criteria were selected. This is depicted in Table 1.

Inclusion criteria	Exclusion criteria
Already published articles	Articles not in English Language
Open access available online	Not open access articles
Research articles and conference papers	Not research articles
English language only	Studies that do not match the keywords
Peer-reviewed Journal articles	Duplicate articles within the databases

Table 1: research criteria

4. Strategy for Digital Transformation

MGA-MENA The company has mapped out a detailed plan to follow in order to realize its objective of undergoing a digital transformation that is fuelled by AI. In order to provide clients with intelligent and faster service, enhance operational procedures, and enable speedy deployment of network technologies, the architecture of the telecom network was transformed from the legacy architecture to the telecom cloud architecture. The deployment of data centres, software-defined networking (SDN), and the virtualization of network functions were all involved. When implementing a comprehensive AI-driven solution, there are some features that an aging telecom network cannot supply or is prohibited from delivering. These functionalities are required for the solution to be successful. Because there is now less hardware, greater vendor freedom, and a separation of hardware and software, which was previously a typical network constraint, the engineering and information technology architecture have been made simpler. This suggests that the telecommunications industry is moving toward a model that relies more heavily on software, with centralized management (which is referred to as an orchestrator in the telecommunications industry) acting as the brain and making use of contemporary Application Programming Interface APIs to support MGA-MENA's transition from hardware to software and accountability for service resilience.

It is of the utmost importance to ascertain whether or not the chosen vendor satisfies the prerequisites imposed by the cloud intelligence architecture and provides support for the MGA-MENA business. [16] As an illustration, a number of mobile core systems, such as Evolved Packet Core (EPC), are transitioning from an architecture that is based on hardware to one that is based on software.

Table 2: sample threat and mitigation table for AI &CC Its Impact on Telecom Sector

Type	Description	Impact on Telecom Sector	Explanation	Reference
Cloud-based AI	AI algorithms and models are hosted on cloud platforms, allowing telecom companies to access them remotely.	Improved network performance, reduced costs, and enhanced customer experience.	Cloud-based AI enables telecom companies to optimize network performance, reduce costs, and provide personalized services to customers.	[1], [3] [4]
AI-powered Network Management	AI algorithms are used to manage and optimize telecom networks, improving efficiency and reducing downtime.	Improved network performance, reduced costs, and enhanced customer experience.	AI-powered network management enables telecom companies to optimize network performance, reduce costs, and provide personalized services to customers.	[2], [7]
Predictive Maintenance	AI algorithms are used to predict equipment failures and schedule maintenance, reducing downtime and improving network reliability.	Improved network reliability, reduced costs, and enhanced customer experience.	Predictive maintenance enables telecom companies to reduce downtime, improve network reliability, and provide better services to customers.	[5], [10]
Chatbots and Virtual Assistants	AI-powered chatbots and virtual assistants are used to provide customer support and automate routine tasks.	Improved customer experience, reduced costs, and increased efficiency.	Chatbots and virtual assistants enable telecom companies to provide personalized customer support, reduce costs, and improve efficiency.	[13], [16]
Fraud Detection	AI algorithms are used to detect and prevent fraud in telecom networks, reducing losses and improving security.	Improved security, reduced losses, and enhanced customer experience.	Fraud detection enables telecom companies to prevent losses, improve security, and provide better services to customers.	[9], [10] [11]

Because these solutions make use of NFV infrastructure and open the door to intelligent operation that is supported by AI and machine learning, engineering in MGA-MENA may be able to profit from high optimization, effective resource usage, and decreased CAPX costs as a result of implementing these solutions. It is essential to keep in mind that MGA-MENA migrated their access network to a fibre architecture utilizing GPON, the coverage of which came close to 92% in inhabited areas. Virtual Customer Premises Equipment (vCPE), a technology that enables the relocation of certain router tasks to the cloud, is currently being integrated into the network in

order to further improve it and assist MGA-MENA Company in streamlining and accelerating service delivery while also offering new prospects. MGA-MENA Corporation will be able to place artificial intelligence (AI) or machine learning at the top of this solution as part of Phase One of this particular service or solution. This will allow the company to improve service management, supply new products more quickly, and improve the customer experience. The mobile access network can be moved from its silo site structure to the cloud and virtual radio access network (vRAN) by pooling baseband units (BBUs) in central exchanges and front-hauling connections from POP to the last mile. This enables the provision of intelligent customer service in terms of bandwidth requirements, traffic streaming, and mobile connections.

5. Operating Excellence

The combination of cloud computing and artificial intelligence enables engineering to utilize cloud services with network function virtualization (NFV) to capture all network events and start machine learning powered by integration with an orchestrator based on APIs and multiple sources of database, virtual network, and software-defined networking (SDN). This would lead to continuously improving customer experiences, providing innovative self-care portals to customers, and maintaining networks in top condition by implementing self-healing. Additionally, by utilizing an artificial intelligence-powered NFV network, an automated network with the use of machine learning, optimization may be accomplished by utilizing the data analysis performed by AI engines from a variety of sources and knowledge databases. This will improve support for resource relocation, traffic optimization, failure prediction, and network continuous assurance. Moreover, by utilizing an automated network with the use of machine learning, an artificial intelligence-powered NFV network may be utilized [17] [18].

As a result of this, the operation personnel are now able to focus on areas that require their expertise, which will assist MGA-MENA in lowering its OPEX, better rectifying auto errors, and resolving network issues. Even though the usage rate is low at the moment, the goal is to employ AI for more than twenty percent of operational activities. This is something that is only conceivable for services or networks that use cloud or NFV technologies. Motiv, an automatic self-healing system, and autonomous capacity planning on the access network side are three examples of the benefits that have been investigated by MGA-MENA. The self-service site, which is called "Motiv," is another. A customer who has Motiv can utilize the MGA-MENA App to troubleshoot any issues he may be having with his e-Life line services. The system will do a comprehensive analysis of the client's issue before deciding whether or not to make the necessary adjustments and corrections without first notifying the MGA-MENA Company. This strategy has the potential to resolve in excess of a million different situations.

A network that is too old would be unable to sustain such a solution. Second, artificial intelligence is used in network self-healing to do a comprehensive verification of the network. This verification includes detecting whether there will be a scheduled outage in order to carry out the most effective traffic rerouting and allot the required resources. Continuous monitoring and analysis of millions of data points, including network behaviour, network traffic, and NMS warning indications, are performed in order to forecast the occurrence of any probable breakdown. It is important to keep in mind that a ticket is always available to record any event- or performance-

related data, since this information serves as the foundation for machine learning. The degree of adaptation is not where it ought to be and is only in the beginning stages at this point. Self-healing networks have an exciting and promising future. Third, the manual auto capacity planning that is still part of the development process for the auto capacity planning software Data must be examined from a wide variety of sources, including customer relationship management (CRM) software, system connections, inventory, and projections. The last step, but certainly not the least, is formulating a plan for the extension of the access network system on an annual (and, more recently, every six-month) basis. Due to the length of time involved, careful preparation is required. However, AI will function as a system that will routinely evaluate data from all sources in order to generate robust tactics and decrease inaccuracies caused by existing practice. will learn from CRM about the rate of demand in a particular region and the resources that are available, and it will expand with updated forecasts so that a strategy can be put into place for when to do expansion, the number of connections that are necessary, the types of customers, and the load on each system based on requested services in order to avoid any system uplink congestion.

6. Product Management or strategy

Through the utilization of machine learning and a service orchestrator, the MGA-MENA Corporation has developed a system that, in response to the requirements of customers, may either make rapid selections or offer suggestions. This is also reinforced by the MGA-MENA Company's plan to utilize vCPE, which was previously announced and would boost customer happiness and revenue growth. vCPE was previously indicated. At this stage in the vCPE process, only the services that are required by the targeted business customers will be provided to those customers. After it is finished, the system allocation, the optimal path, and the virtual resources will be set up. The service will then be available, and it will be able to adjust more quickly than it would be able to with a normal lock. services under contract Certain components are installed manually with the assistance of a person. A certain kind of mobile phone data traffic, like that which is generated by Instagram or one of the many other programs that are used for social media, should be directed through the optimal international route in order to provide the best possible experience for customers. The digital store is another example of how MGA-MENA benefits from the transition from IPTV as part of the e-life package to NFV and SDN. The digital store uses AI to empower each customer with an engaging and personalized experience based on AI analytics of data related to customer usage, interest, and favourites. These insights are gleaned from customer data that is stored in the digital store [19].

All of these data captures make it possible to recommend and customize VoD on the main screen, as well as to recommend utilizing VoD as soon as it is practically possible. In addition, the MGA-MENA Company has been recognized for their ground-breaking e-Life TV interface as well as the improvements they have made to the way that telecommunications companies operate services such as these as engine providers. These modifications ensure that each customer has a one-of-a-kind experience and that the services are presented to him in a manner that is appealing to him depending on his profile. in addition to a differentiation between adults and children.

7. Using SME and Case Support

The MGA-MENA Corporation created the Lab with a network-like environment and a variety of tools so that employees could test and confirm the required strategy and increase the benefit of this correlation by including the staff in this transformation. To enhance the number of use cases and

make use of SME in the team domain, an expert team will analyse concepts for ideas presented in order to migrate work to the AI Cloud [20] [21].

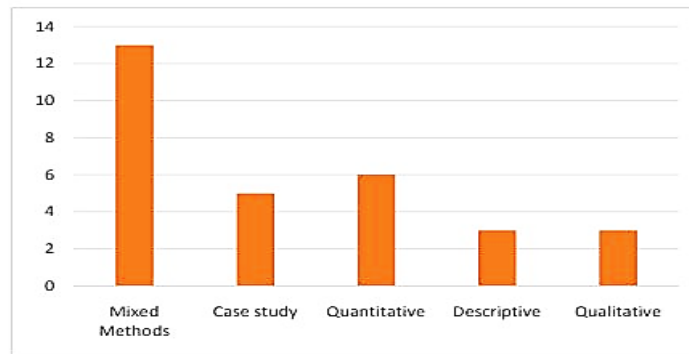


Figure 1. Research approaches

Analysis

Coding the qualitative data based on the primary conceptual work allowed for the determination of the advantages of cloud computing with respect to artificial intelligence. Computing in the cloud and artificial intelligence are two technologies that work together to help the telecommunications industry become more adaptable, speed up the deployment of services, and run more intelligently. As a result of this correlation, it became abundantly evident that the service provider could also offer automatically optimized networks, self-healing systems, and intelligent capacity planning in addition to continuously improving the customer experience. The alliance is beneficial to the telecommunications industry since it facilitates the shift from hardware to software in the delivery of services. switches to software-defined networking and the use of artificial intelligence-powered virtualized network functions, where high processing power enables telecom to layer logic on top of these, boosting their capabilities and demonstrating a direct relationship with the notion that we confirmed. shifts to software-defined networking and the use of artificial intelligence-powered virtualized network functions.

This transition away from traditional telecom networks and toward customized networks is essential because it makes it more difficult for businesses to function without the assistance of artificial intelligence. In addition to the benefits that were illustrated by the manner in which MGA-MENA adjusted its infrastructure, carried out its operations, provided services, and responded to the experiences of its customers, the conclusion of this link is In addition, the awareness that archaic systems networks cannot be used to access intelligence fuelled an effort to update its infrastructure. The potential competitive gains that MGA-MENA may obtain from this partnership are highlighted by a number of use cases that have already been implemented and by a number of projects that are now being developed in order to carry out MGA's plan for MENA to become a smarter company.

The achievement of success will be contingent on a wide range of criteria, such as a concern for security and compliance, suitable legislation to manage this technology, and effective data storage to generate intelligent reasoning. In addition, the telecom industry needs to take into consideration the large number of computations that are necessary for deep learning and machine learning techniques to be carried out rapidly.

This implies that these techniques require significant processing resources. Combine effective logic and algorithms with actual use cases in order to prevent excessive use of the cloud's resources.

Table of advantage

Scalability	Cloud computing provides a scalable infrastructure that can handle large amounts of data and support multiple users simultaneously
Cost Reduction	Cloud computing and AI can help telecom companies reduce costs by optimizing network performance and resource allocation.
Improved Network Performance	With real-time analysis of network traffic and usage patterns, cloud computing and AI can help improve network performance, reduce downtime, and deliver a better customer experience.
Enhanced Security	Cloud computing and AI can provide advanced security features such as anomaly detection, threat prevention, and real-time data monitoring
Personalization	By analyzing customer data and usage patterns, operators can provide targeted services that meet the specific needs of each customer.
New Revenue Streams	By examining client data and use habits, cloud computing and AI can assist in locating new sources of income. This may result in the creation of fresh products and services that can be profitable, boosting profitability.

8. Challenges & open search issues:

Combining cloud computing with artificial intelligence (AI) has the potential to revolutionize the telecom sector, but it also presents several challenges and open research issues. Here are some of the challenges and open research issues associated with this combination:

Data Privacy and Security: Cloud computing and AI rely heavily on data, which raises concerns about data privacy and security. Telecom companies must ensure that customer data is protected and secure, especially when it is stored in the cloud.

Integration and Interoperability: Integrating cloud computing and AI into existing telecom infrastructure can be challenging, especially when it comes to interoperability between different systems and platforms. Telecom companies must ensure that their systems can work together seamlessly to provide a unified experience for customers.

Scalability and Performance: Cloud computing and AI require significant computational resources, which can impact scalability and performance. Telecom companies must ensure that their systems can handle the increased workload and provide fast and reliable service to customers.

Ethical and Social Implications: The use of AI in telecom raises ethical and social implications, such as bias in decision-making and job displacement. Telecom companies must ensure that their use of AI is ethical and socially responsible.

Open Research Issues: There are several open research issues associated with combining cloud computing and AI in the telecom sector, such as developing new algorithms and models for AI, improving data privacy and security, and addressing ethical and social implications.

Overall, combining cloud computing and AI has the potential to transform the telecom sector, but it also presents several challenges and open research issues that must be addressed. Telecom companies must carefully consider these issues and work to develop solutions that ensure the safe and effective use of these technologies.

The combination of artificial intelligence and cloud computing in the telecommunications industry will result in an improvement in network efficiency, an improvement in user experience, improved network security, increased automation and efficiency, and the creation of new revenue streams.

It is possible that AI will have a substantial impact on the operations of MGA-MENA, including planned or successful initiatives, repercussions on operational excellence, and customer experience. This might help MGA-MENA maintain its status as an ICT provider in the MENA region and rank higher. AI-powered solutions have the potential to boost operational efficiency in a number of ways, including through the automation of processes and the delivery of insights in real time. Through the provision of personalized services and help, AI may contribute to an increase in customer satisfaction. If MGA-MENA's AI projects are successful, it will be easier for the company to stay ahead of its competitors and keep its position as the leading ICT provider in the region. MGA-MENA may focus on the following areas to continue exploiting cloud computing and artificial intelligence technology to boost innovation and growth in the region:

- 1- Make an investment in AI-driven analytics and insights to improve decision-making and obtain a deeper understanding of your customers.
- 2- Create chatbots and virtual assistants powered by artificial intelligence in order to improve customer care and assistance.
- 3- Leverage the capabilities of cloud computing to make their network infrastructure more scalable and flexible.
4. In order to improve the operational efficiency of your business and lower your costs, implement AI-powered predictive maintenance and network optimization.
5. Look into new ways to conduct business and make money by offering cloud computing and artificial intelligence-enabled solutions and services.

Integrating AI into customer service operations may have a positive effect on customer satisfaction and retention rates in general. This might be achieved by providing assistance around the clock, decreasing response times, and personalizing customer experiences. Virtual assistants and chatbots that are driven by AI can provide answers to simple questions and full fill requests for assistance, freeing up human customer service representatives to address more complex issues. It is possible that higher levels of customer satisfaction and retention will result from providing customers with service that is both faster and more effective.

Cloud computing solutions have the potential to improve operational efficiency by enabling the scalability and flexibility of network infrastructure, lowering the amount of human workload through automation, and offering real-time insights and analytics for improved decision-making. Security solutions that are hosted in the cloud have the potential to offer superior protection against cyberattacks. The precise cloud computing solutions that the telecommunications company

chooses to employ and how those solutions will affect the firm's operational efficiency will be determined by the company's unique business needs and goals.

9. Conclusion

With the majority of telecommunications companies aiming to modernize legacy networks dependent on network function virtualization with software-defined networking in order to compete and survive in the pressure of a rapidly changing environment, the transition to cloud computing has advanced significantly. MGA-MENA Corporation has improved its network throughout the course of several years of operation. Due to the impossibility of people processing such a large volume of data, moving to the cloud alone is insufficient to manage complicated and dynamic processes. In order to enhance the value of the cloud, AI is crucial. This will lead to better traffic categorization, more accurate network problem forecasts, time optimization, and better customer services. Therefore, it is thought that cloud computing and AI are the best business models. The AI and cloud computing strategy, however, works well for telecom companies with a large clientele and several concurrent activities. The study adds just a little to our knowledge of how large corporations like the telecoms may become more effective by using managerial tactics and cutting-edge technological innovations like cloud computing and artificial intelligence.

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